

IMPACT EVALUATION FOR THE COMMUNITY BASED ORGANIZATION (CBO) ARREARS CASE MANAGEMENT PILOT

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CBO Pilot IOU Representatives

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1 EXECUTIVE SUMMARY

This impact evaluation examines California's Community Based Organization (CBO) Arrears Case Management Pilot Program (the pilot), which launched in November 2024, to help residential utility customers address and resolve utility bill arrearages that are 90 days or more past due. This pilot was required by Decision (D.) 22-04-037 (April 2022),¹ in which the California Public Utilities Commission (CPUC) ordered it was “necessary due to the utility bill debt crisis in California that predated the COVID 19 pandemic and has only been exacerbated by it.”² D. 24-02-046 authorized and funded the pilot.³ The CPUC envisioned that this statewide CBO Pilot would test whether customized case management services provided by local CBOs could be effective at helping residential customers reduce arrearages levels and disconnections.

1.1 BACKGROUND

The California investor-owned utilities (IOUs) Pacific Gas and Electric (PG&E), Southern California Edison (SCE), San Diego Gas and Electric (SDG&E), and Southern California Gas (SoCalGas) selected six community-based organizations across the state, with varying experience in energy assistance programs and community case management, to market and implement the pilot. Key pilot parameters set by the CPUC included:

- **Three-tier case management service model:** Customers who enrolled in the pilot could receive up to 12 months of individualized case management services provided in a tiered format. Tier 1 provided immediate relief through payment plan negotiation and enrollment in programs like California Alternate Rates for Energy (CARE), Family Electric Rate Assistance (FERA), Arrearage Management Plan (AMP), and the Low-Income Home Energy Assistance Program (LIHEAP); Tier 2 offered continued support through energy management programs and beneficial rate plans; Tier 3 provided ongoing monitoring and support to maintain progress. Customers did not need to move through the tiers sequentially to participate as not all customers needed all tiers.
- **Target population:** Residential customers with arrearages 90 days or older, at risk of disconnection, residing in CPUC selected zip codes across four investor-owned utility territories (PG&E, SCE, SoCalGas, SDG&E), regardless of income.

¹ CPUC D. 22-04-037 Requiring Development of Community Based Organization Case Management Pilot Program to Reduce Arrearages Associated with the COVID-19 Pandemic.

<https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M468/K801/468801115.PDF>

² Ibid. Pg. 34

³ CPUC D.24-02-046 Approving Community-Based Organization Arrears Case Management Pilot Program.

<https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M525/K668/525668769.PDF>

- **Enrollment caps:** In both D.22-04-037 (pg. 2) and D.24-02-046 (pg. 7), the CPUC stated that they “expected that approximately 12,000 customers would receive services from the pilot”.⁴ Based on discussions with the IOUs and CBOs, the IOUs were unable to meet the initial target within the pilot’s timeline and so had a lower target based on the zip code coverage and capacity of the CBOs selected to implement the pilot.
- **Timeline:** In accordance with the Decision, the enrollment period began December 11, 2024, and officially ended on July 9, 2025 (according to D.24-02-046); case management service availability continued through April 15, 2026.

1.2 RESEARCH OBJECTIVES

Attachment A of D. 24-02-046, approving the CBO Arrears Case Management Pilot Program required delivering a final evaluation report to the CPUC Energy Division (ED) and Pilot Implementation Working Group,⁵ within 930 days of the effective day of the decision, or September 2, 2026. The primary research objectives of the CBO Pilot include:

1. Assessing the effectiveness of personalized case management in reducing arrearage levels and disconnections, as well as quantifying the pilot’s impact on these objectives [Section 6.2].
2. Determining if the quantitative and qualitative benefits of the CBO Pilot sufficiently outweigh the costs to warrant an expansion of the pilot into a program. Based on overall evaluation findings, recommending if the case management pilot should expand in scale beyond the pilot phase [Section 8.1].
3. Determining which pilot interventions, or combination of interventions, are effective in reducing participants’ arrearages and disconnections [Section 6].
4. Identifying the pilot’s data needs and recommending data collection and management processes for both the IOUs and CBOs [Section 4].
5. Conducting an impact evaluation that includes the following elements:
 - a. A baseline assessment [Section 5.2],
 - b. A quasi-experimental design (QED) comparing participants and matched non-participants to measure pilot impacts for different customer segments, geographic factors, program enrollment status, and case management approaches [Section 6], and
 - c. An evaluability assessment given the eligible customer recruitment and data collection efforts [Section 4].
6. Conducting a process evaluation that includes the following elements [Appendix A]

⁴ Note that the original goals for the pilot were determined prior to releasing the RFP and selecting the CBOs.

⁵ Membership of the Pilot Implementation Working Group comprises of IOU representatives, Commission staff, and at least one CBO contractor from each service territory, as well as participating Community Choice Aggregators (CCAs) and parties to the R.18-07-005 proceeding.

- a. In-depth interviews or surveys with customers, CBOs, and other stakeholders, [Appendix B and C]
- b. Identify opportunities for mid-course process and customer journey improvements, and
- c. Compare case management effectiveness across different CBOs and identify factors contributing to efficiency and effectiveness.

Note that the Process Evaluation was completed as part of this study and is included as Appendix A. This evaluation served as an internal deliverable and was completed on 3/10/2026.

7. Comparing the costs of standard utility engagement⁶ with the costs of CBO Pilot engagement (pilot group). The incremental costs attributable to the pilot are compared to the pilot's benefits [Section 8.1].

1.3 PILOT IMPACTS

The CBO Pilot evaluation assessed a range of potential pilot impacts including changes in arrearages, an uptake in participation in other programs, and disconnections. High level impact findings are presented below.

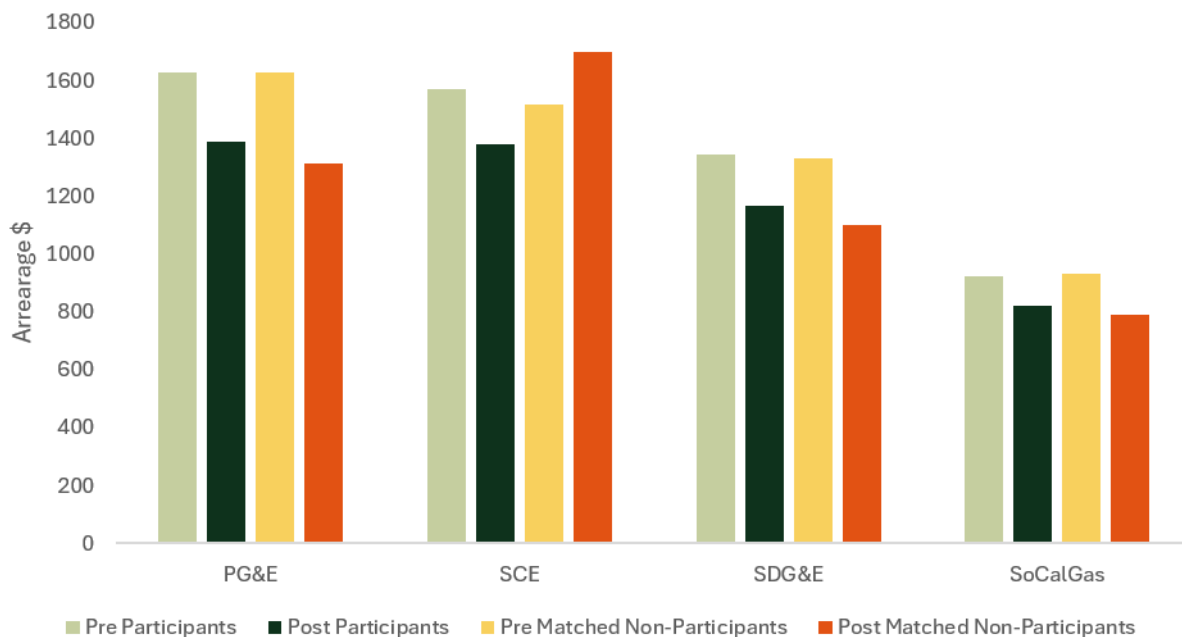
Arrearage Reductions

The impact of the CBO Pilot on arrears was assessed using a difference-in-differences approach using a quasi-experimental design with a matched control group. The analysis found that the pilot had a statistically significant impact on arrearages for participants served by one of SCE's CBOs (CAPSBC), but no significant impact on arrears was found for participants served by any of the other utilities' CBOs.

Figure 1-1 presents the average arrearage levels of pilot participants and their matched non-participants during the pre- and post-enrollment periods. On average, PG&E, SDG&E, and SoCalGas participants and non-participants reduced their arrearages by a similar amount. In contrast, SCE participants reduced their arrearages while their matched non-participant's arrears increased during the post-enrollment period.

⁶ D. 24-02-046 ordered the large IOUs to report which actions constitute standard utility engagement and provide the costs associated with standard utility engagement. The IOUs defined standard utility engagement as the services and assistance they provide to customers via their call centers.

FIGURE 1-1: PRE AND POST CBO PILOT AVERAGE ARREARS BY PARTICIPATION STATUS AND IOU



Two-stage difference-in-differences (2sDiD) models were used to further validate whether the CBO Pilot led to statistically significant reductions in arrears. The model estimated the impact of the pilot on participant arrears in the post-enrollment period. The model was estimated separately by IOU, by IOU and CBO, and by IOU and Net Energy Metering (NEM) status. Table 1-1 presents the findings from the 2sDiD model by IOU and CBO. Only one CBO participated in each of PG&E's and SDG&E's pilots while SCE and SoCalGas each had two CBOs. When interpreting the model results, a negative change represents a decrease in arrears, while a positive value represents an increase in arrears relative to trends observed in the control group. The results presented in Table 1-1 are generally consistent with the graphical presentation in Figure 1-1, only SCE's CAPSBC CBO is associated with statistically significant reductions in arrears (a \$495 average reduction in total arrears per household).⁷ The impact of the other five CBOs was not found to be statistically significant and frequently not associated with a reduction in arrears.

⁷ Participants in SCE's UWTC CBO increased their average arrears between the pre- and post-pilot period by approximately \$400 while their matched non-participants experienced an average arrears increase of approximately \$50. The observed increase in post-period arrears by SCE's CAPSBC non-parts and UWTC's parts and non-parts shows consistency across SCE's pilot eligible population even though it is inconsistent with the other utilities.

TABLE 1-1: TWO-STAGE DID RESULTS BY CBO⁸

IOU	CBO	Two-Stage DiD Estimate	Standard Error	p-value*	Participant Count ⁹	Mean Participant Arrears Pre	Mean Participant Arrears Post	Mean Control Arrears Pre	Mean Control Arrears Post
PG&E	CAPK	50.14	36.84	0.1735	1,862	\$1,625	\$1,387	\$1,625	\$1,311
SCE	CAPSBC	-495.24	80.08	0.0000	203	\$1,601	\$1,256	\$1,578	\$1,701
	UWTC	326.80	244.18	0.1810	35	\$1,683	\$2,097	\$1,617	\$1,653
SDG&E	MAAC	74.74	48.52	0.1235	606	\$1,318	\$1,164	\$1,320	\$1,093
SoCalGas	FTBMI	81.75	69.41	0.2389	142	\$859	\$809	\$856	\$708
	SBX	-53.35	94.04	0.5705	121	\$1,002	\$812	\$1,015	\$879

*a p-value of < 0.05 indicates statistical significance

Other Program Uptake and Disconnection Events

The CBOs were instructed to provide pilot participants with information on a variety of programs that could reduce arrears either directly or indirectly. Verdant looked at enrollment for four of these programs:

- **AMP:** Provides monthly arrearage forgiveness equal to one-twelfth of the enrolled balance for customers who remain current on their monthly utility bill for one year.
- **CARE:** Provides discounts on energy bills for low-income households potentially making it easier to pay more of the bill.
- **LIHEAP:** Provides eligible low-income households with assistance to pay heating and cooling costs as well as provides energy efficiency support.
- **Energy Savings Assistance program (ESA):** Provides no-cost energy-saving home improvements to income-qualified customers, helping reduce energy bills and improve efficiency.

Verdant examined the frequency of participation in these programs before and after pilot enrollment for participants and non-participants. The team then used two approaches to determine if the change in participation in the post-period was consistent with pilot impacts. First, we estimated logit models of other program enrollment to determine whether pilot participation was predictive of participation in these other programs. Second, we looked at contingency tables of participation by period and calculated Chi-squared statistics to test whether the proportion of participants who enrolled in the program following pilot enrollment differed significantly from the proportion of non-participants who did so.

⁸ More information on the 2sDiD model can be found in Section 3.1.

⁹ The Participant Count reflects the final count of participants who made it through the data attrition process. More information on this process can be found in Section 4.4.

Verdant also analyzed disconnection frequency using the same methodology. These results are also included in this section.

Table 1-2 summarizes the results of logit models of other program uptake and the impact of CBO Pilot participation by IOU. PG&E's pilot led to a statistically significant increase in enrollment in CARE, AMP, ESA, and LIHEAP, but this increased enrollment did not translate into a reduction in participants' arrearages relative to non-participants.¹⁰ SCE's pilot led to a significant increase in enrollment in AMP and LIHEAP, while SDG&E's pilot increased enrollment in CARE and AMP. SoCalGas showed a significant increase in enrollment for AMP only.

TABLE 1-2: SUMMARY OF OTHER PROGRAM AND DISCONNECT LOGIT MODEL IMPACTS

IOU	CARE	AMP	ESA	LIHEAP	Disconnections
PG&E	✓	✓	✓	✓	✗
SCE	✗	✓	✗	✓	✗
SDG&E	✓	✓	✗	✗	✗
SoCalGas	✗	✓	✗	✗	

The ✓ indicates a statistically significant impact coefficient in logit model at 0.05, a ✗ indicates no impact, and an empty cell indicates no model estimated.

In addition to determining if changes in enrollment were statistically significant, the logit models enabled Verdant to calculate the pilot's average marginal impact¹¹ on other program enrollment (CARE, AMP, LIHEAP, etc.). SCE's LIHEAP enrollment had the largest average marginal impact at 51%. While other CBOs also assisted with or referred participants to LIHEAP,¹² their marginal impact was relatively low (5 to 10%). CAPSBC's large marginal impact on LIHEAP enrollment likely explains their participants' statistically significant reduction in arrearages.¹³

None of the pilots are estimated to have reduced the number of disconnection events.

¹⁰ PG&E's CBO Pilot had more participants than the other IOU pilots. The larger number of participants increases the likelihood of finding differences between the program uptake of participants and non-participants if there is a difference.

¹¹ The change in the probability of enrollment in the other program (CARE, etc.) that was due to the pilot enrollment.

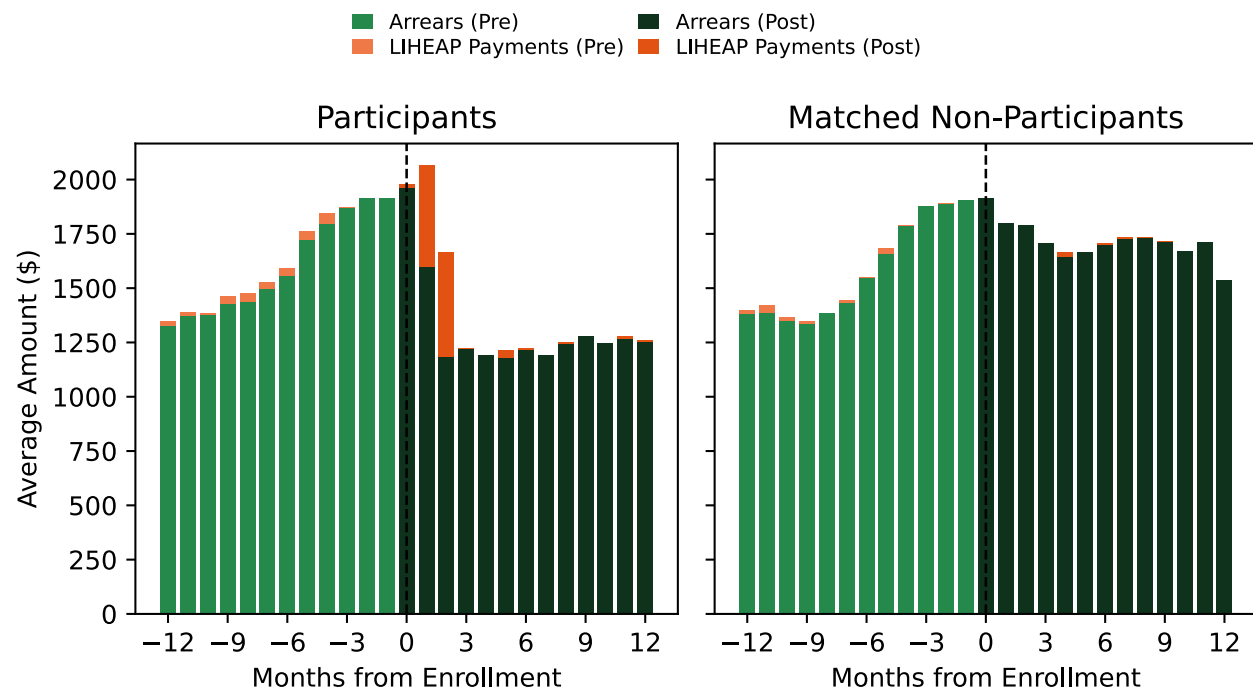
¹² See Appendix A for further details in the Process Evaluation Report.

¹³ SCE's pilot participants' average LIHEAP payment exceeds \$1,200. An amount capable of helping with high utility bills and wiping out smaller sized arrearages with one round of assistance.

Understanding the Main Impacts

The results for arrearage reductions and other program uptake seen in isolation provide an incomplete picture. The 2SDiD models showed significant arrearage reductions for SCE, but on their own provide no means of understanding how the pilot led to those reductions. However, when combined with the results on uptake in other programs, a clear picture of how one effect (LIHEAP enrollment) directly led to the arrearage reductions.¹⁴ This is depicted clearly in Figure 1-2, which shows the average arrears and LIHEAP payments for the pilot participants and matched controls associated with CAPSBC, which accounted for most of SCE’s customers. To deal with the varying enrollment periods, the data are presented by the number of months from enrollment. For the pilot participants, there are markedly large LIHEAP payments in the first two months after the month of pilot enrollment, whereas the matched non-participants have no discernable payments. Logically, the LIHEAP payments for the participants directly correspond with the observed drop in arrearage levels. Combining these two results provides a more holistic understanding of how the program uptake led directly to the only significant arrearage reductions we found in our analysis.

FIGURE 1-2: AVERAGE ARREARS AND LIHEAP PAYMENTS FOR SCE, CAPSBC BY MONTHS FROM ENROLLMENT



¹⁴ It is worth noting that the impact team relied on the knowledge of the process team to validate and make sense of these findings.

1.4 CUSTOMER EXPERIENCE RESULTS

The evaluation team conducted a final customer experience survey with pilot participants. Survey respondents were asked about their satisfaction with the pilot, if they believed the pilot helped lower the amount they owed, and what they learned during the pilot. The survey results showed that:

- 64% of respondents indicated some level of satisfaction, but one in five respondents were dissatisfied with their experience.
- 58% of respondents believed the pilot helped them lower the amount they owed; 30% said it didn't.
- 69% of respondents indicated they learned something during the pilot. Respondents gained more knowledge in the following areas:
 - What programs were available to help lower bills
 - Ways to save energy
 - How to stay current on utility bills
 - How to manage their utility bills
 - How to budget

1.5 PILOT COSTS VS. IMPACT

Verdant reviewed the pilot costs and the cost of standard utility engagement, in line with D. 24-02-046. Key results showed:

- The total cost to implement the pilot was \$4,381,295 with an average cost per participant of \$1,160.
 - PG&E's cost per participant: \$873
 - SCE's cost per participant: \$1,238
 - SoCalGas' cost per participant: \$1,864
 - SDG&E's cost per participant: \$1,806
- The total cost of standard utility engagement was \$43,199.
- The total attributable impact on arrearage reductions was \$194,535 with an average arrearage reduction of \$495.
 - These two costs are significantly lower than the \$4M to implement the pilot and average participant cost of \$1,160

1.6 KEY EVALUATION FINDINGS

Key findings and recommendations from the CBO Pilot evaluation are presented below.

Overarching Pilot Findings and Recommendations

Below we present our overarching pilot findings. Further details on each of these findings are included in the noted sections.

Findings

- **FINDING:** A time-series analysis of arrearages found that many CBO participants were able to reduce their balances, though overall continued to carry arrears. [Section 6.1] This same declining trend was observed among most non-participants, and the 2sDiD model confirmed that the reduction in arrearages for PG&E, SDG&E, and SoCalGas was not statistically significant. [Section 6.2.1] Across all utilities, the CBO Pilot had a limited overall impact on arrearages, with CAPSBC's (SCE) participants the only group to show a statistically significant reduction. [Section 6.2.1]
- **FINDING:** The CBO Pilot led to a statistically significant increase in other program participation with the largest marginal increase associated with LIHEAP enrollment for SCE's CAPSBC. [Section 6.3]
 - While the CBO Pilot increased enrollment in several programs, the increase was typically limited to a marginal increase of ten percentage points or less. This modest increase in other program participation may have reduced arrears for a small number of customers, but it likely had little effect on the overall average arrearages of participants relative to non-participants.
 - SCE's CAPSBC increased participants' enrollment in LIHEAP by over 50% and this increase in LIHEAP enrollment is likely responsible for the CBO's impact on arrears.
- **FINDING:** Prior to the pilot, SCE's and SDG&E's eligible populations had a high rate of enrollment in the low-income CARE rate (70-90% of both participants and non-participants). This left few opportunities for CBOs to further increase CARE enrollment levels. [Section 6.3.1]
 - PG&E's pre-pilot CARE enrollment share was 53% for participants and 56% for non-participants, leaving a substantial share of eligible customers unenrolled. By the end of the post-pilot period, 89% of participants and 80% of non-participants were enrolled in CARE. Because enrollment increased in both participant and non-participant groups, it is likely that most of the increase is attributable to PG&E's broad ME&O efforts; the pilot's marginal impact accounts for a 10.7 percentage point increase in participant enrollment.
 - SDG&E pilot participants saw a smaller, but also statistically significant impact on CARE enrollment, with pilot participation in SDG&E's pilot accounting for a 6.95 percentage point increase in participants' CARE enrollment in the post-period.
 - Pilot participation for SCE and SoCalGas did not lead to a statistically significant increase in CARE enrollment.
- **FINDING:** PG&E's CBO Pilot led to a small (approximately five percentage points) but statistically significant increase in ESA enrollments. PG&E's pilot eligible population consumes substantially more

electricity than the average home in PG&E's territory, which helps to explain their high arrearage levels. [Section 6.3.4]

- **FINDING:** PG&E's CBO Pilot led to a small, but statistically significant difference between participants and non-participants who received Match My Payment (MMP) relief in the post-period, with participants enrolling at a higher rate (7.9%) than non-participants (2.9%) [Section 6.3.5].
- **FINDING:** PG&E's CBO Pilot led to a small but statistically significant increase in predicted Relief for Energy Assistance through Community Assistance Help (REACH) enrollment of approximately 4 percentage points [Section 6.3.5].
- **FINDING:** SDG&E's CBO pilot caused a 2.4 percentage-point increase in the predicted probability of enrolling in SDG&E's Neighbor-To-Neighbor (NTN) as a participant in the pilot compared to a non-participant [Section 6.3.5].
- **FINDING:** Participation in SoCalGas's Pilot led to a 3.3 percentage-point increase in customers' predicted probability of enrolling in Gas Assistance Fund (GAF) [Section 6.3.5].
- **FINDING:** Despite the significant increased enrollment in other utility programs, with the exception of LIHEAP for CAPSBC, there is no evidence that this resulted in any significant decrease in arrearage levels. The number of increased participants in these programs was too few and/or the impacts were too small. [Section 6]
- **FINDING:** Only 58% of participants felt the pilot helped them lower their bills and only 64% were satisfied with the pilot. [Section 7]
- **FINDING:** The pilot costs were \$4,381,295 and reduced \$194,535 of utility debt. [Section 8.1]
- **FINDING:** The CBO Pilot was unsuccessful in reducing arrearages for all participants except for those who worked with CAPSBC. The average reduction in arrears for these participants was \$495, but it cost, on average, \$1,238 per participant to run the pilot for SCE. The lack of pilot impacts on arrearages, the cost difference between how much arrears were reduced vs. how much was spent to reduce the arrears, and the dissatisfaction of survey respondents (<80% satisfaction) supports the assertion that the pilot was unsuccessful in meeting its objectives. [Section 8.1]

Recommendations

- **RECOMMENDATION:** Many of the CBO Pilot's impacts appear to be associated with increased participation in other programs designed to reduce arrears, energy usage, or bills. Depending on the actual time of enrollment, some of these other programs may take time to show CBO Pilot impacts. For example, customers that enrolled in AMP seven months after pilot enrollment will not show the full effect on arrears until well after the pilot's one-year post-enrollment period is over.¹⁵ Extending

¹⁵ Some programs in which pilot participants enrolled, such as AMP and CARE, have gradual effects on customer bills and arrearages. As a result, the full impact of these programs may not be observable within the study period. For example, under AMP, a customer's eligible debt is forgiven after 12 months of remaining current on their bills. If a pilot participant enrolled in AMP in March 2026 and the analysis only includes data through May

the period of observation for up to another year could determine whether enrollment in those other programs results in an actual reduction of arrears.

- **RECOMMENDATION:** CAPSBC had the largest marginal impact on LIHEAP enrollments, directly combating and reducing participant debt. Results from this pilot suggest that debt reduction impacts derive from direct debt relief paired with education and instant program enrollment assistance (as was the case with CAPSBC and LIHEAP).
- **RECOMMENDATION:** Given the relatively high energy usage of PG&E's eligible population, targeting ESA to customers with high energy and high arrearages could help these customers reduce their usage, reduce their arrears, and maintain their utility bill payment.
- **RECOMMENDATION:** With the high cost of the pilot and the small overall impact on arrears, there is no justification for rolling out the CBO Pilot to a broader population as a utility program.

2026, the analysis would capture only the initial months following enrollment and would not reflect the program's full potential impact on the customer's arrearages.

2 INTRODUCTION

In D. 24-02-046, the CBO Pilot was authorized and funded in response to the utility bill debt crisis in California. The pilot was designed to serve residential customers who face difficulty resolving their utility bill debt. The statewide CBO Pilot seeks to test whether customized case management services provided by local CBOs can effectively help residential customers reduce arrearage levels and disconnections and increase enrollment in programs that support energy usage and bill management.

2.1 CBO PILOT BACKGROUND

The CBO Pilot is structured around the goal of helping residential customers in arrears pay off existing utility debt and develop stronger bill management practices going forward. To achieve this, the pilot provides multi-tiered, individualized support. This includes guidance on immediate relief programs such as the AMP and LIHEAP, as well as financial and energy education covering rates and programs that can help reduce energy costs. Two distinguishing features of the pilot are that support is available to both low-income and non-low-income customers with substantial arrears and the pilot is delivered by local CBOs over a period of up to one year. Although the actual implementation deviated from this to varying degrees, this extended engagement allows customers' financial situations and bill management to be assessed and reassessed at multiple points, with payment plans and other arrangements adjusted as needed to meet each customer's evolving needs.

Customers who enroll in the pilot can receive up to 12 months of individualized case management services provided in a tiered format; however, not all participants require three tiers of services. The services were offered on a rolling basis to participants, but the services were not required to be provided in chronological order. The three tiers of services are as follows:

- **Tier 1** helps remove the risk of disconnection through payment plan negotiation, enrollment in programs that provide immediate relief (LIHEAP, CARE/FERA, AMP, etc.) and basic energy and financial education.
- **Tier 2** provides continued support via additional education or payment plan renegotiation and enrollment in energy management programs (energy efficiency, demand response) or beneficial rate plans.
- **Tier 3** provides participants with ongoing support and monitoring of their progress to pay off their arrearages, including revising the customer's action plan based on changes to their circumstances.

It is important to note that each CBO defined and implemented the tier system differently. See Appendix A for more details.

2.2 PILOT OFFERING

The CBO pilot was designed to test whether customized case management services provided by trusted local community-based organizations could effectively help residential customers reduce arrearages and avoid disconnections. IOUs selected six organizations across the state, with varying experience in energy assistance programs and community case management, to market and implement the pilot. (For more information on the participating CBOs see Appendix A.)

Key pilot parameters set by the CPUC include:

- **Three-tier case management service model:** Customers who enrolled in the pilot could receive up to 12 months of individualized case management services provided in a tiered format.
- **Target population:** Residential customers with arrearages 90 days or older, at risk of disconnection, residing in selected zip codes across four investor-owned utility territories (PG&E, SCE, SoCalGas, SDG&E), regardless of income.¹⁶
- **Enrollment caps:** In both D.22-04-037 (pg. 2) and D.24-02-046 (pg. 7), the CPUC stated that they “expected that approximately 12,000 customers would receive services from the pilot”.¹⁷ Based on discussions with the IOUs and CBOs, the IOUs were unable to meet the initial target within the pilot’s timeline and so had a lower target based on the zip code coverage and capacity of the CBOs selected to implement the pilot.
- **Timeline:** In accordance with the Decision, the enrollment period began December 11, 2024 and officially ended on July 9, 2025 (according to the D.24-02-046); case management services continued through April 15, 2026. (For more information on the timeline and slight variations by IOU, see Appendix A.)

While the CPUC set these specific guidelines, the pilot was designed to allow CBOs to leverage unique aspects and approaches to case management. This led to varying service delivery methods for each of the six CBOs. Table 2-1 provides an overview of case management approaches for each CBO based on interviews with the CBOs.

¹⁶ The pilot zip codes scored the highest on the Commission’s affordability ratio metric for a representative gas or electric utility customer at the 20th percentile of household income.

¹⁷ Note that the original goals for the pilot were determined prior to releasing the RFP and selecting the CBOs.

TABLE 2-1: CASE MANAGEMENT DESCRIPTION BY CBOS

IOU	CBO	CBO Case Management Approach (as described by the CBO) <i>Bold indicates key differences between CBOs</i>
PG&E	CAPK	Case managers worked with clients to understand the household's situation and help them set household-specific goals , identify barriers to paying their utility bills, and access over 20 supportive services offered by CAPK (such as budgeting assistance, food assistance, childcare, family services, and program referrals). Case managers directed households to CARE and AMP if eligible, could also provide LIHEAP services, since CAPK is a LIHEAP provider for the targeted zip codes.
SCE	CAPSBC	The main focus for this CBO was directly providing LIHEAP services to help get clients out of debt. This is in contrast to CAPK (the other LIHEAP provider) where the focus was more on offering other supportive services (such as food assistance or the AMP program). Case managers also had all participants attend an in-person 30-minute energy-related workshop , and then provided program referrals, advocacy, and support wherever needed (such as help filling out applications).
	UWTC	Case managers provided information on LIHEAP and other program offerings. Because UWTC is not a LIHEAP provider for the targeted zip codes, case managers primarily waited for LIHEAP funding to become available (through a different organization), and then notified clients that they should act before the funding ran out. UWTC staff described their approach as providing as-needed support and reminders, rather than long-term financial management or energy efficiency program guidance.
SoCalGas	SBX	Case managers helped clients enroll/find programs (first focus was CARE/LIHEAP/ Gas Assistance Fund) and then continued support through attempting to contact participants each month. SBX adjusted the depth of case management based on the client's level of engagement: some clients wanted information and immediate help, while others maintained longer connections for continued support and follow-up.
	FTBMI	Case managers focused on sending customers to the Maravilla Foundation which is a LIHEAP provider, for LIHEAP assistance . They then helped clients navigate LIHEAP paperwork for the Maravilla Foundation and helped them participate in other programs, conducting follow-ups and troubleshooting other problems, as needed.
SDG&E	MAAC	Case managers focused on immediate aid programs (if eligible) to start and then sent emails about available programs and next steps. This included 3-way calls to advocate for clients and educational videos emailed out for continuing support.

Further details on case management approach and implementation strategies can be found in the Process Report in Appendix A.

2.3 EVALUATION OBJECTIVES

Attachment A of D. 24-02-046 (February 15, 2024), Decision Approving the Community-Based Organization Arrears Case Management Pilot Program (the Decision)¹⁸ requires delivering the final evaluation report to the CPUC Energy Division (ED) and Pilot Implementation Working Group,¹⁹ within 930 days of the effective day of the decision, or September 2, 2026. The primary research objectives of the CBO Pilot include the following:

- Assess the effectiveness of personalized case management in reducing arrearage levels and disconnections, as well as quantify the pilot’s impacts on these objectives.
- Determine if the quantitative and qualitative benefits of the CBO Pilot sufficiently outweigh the costs to warrant an expansion of the pilot into a program. Based on overall evaluation findings, recommend if the case management pilot should expand in scale beyond the pilot phase.
- Determine which pilot interventions, or combination of interventions, are effective in reducing participants’ arrearages and disconnections.
- Identify the pilot’s data needs and recommend data collection and management processes for both the IOUs and CBOs.
- Conduct an impact evaluation that includes the following elements:
 - A baseline assessment,
 - A quasi-experimental design comparing participants and matched non-participants to measure pilot impacts for different customer segments, geographic factors, program enrollment status, and case management approaches, and
 - An evaluability assessment given the eligible customer recruitment and data collection efforts.
- Conduct a process evaluation that includes the following elements
 - In-depth interviews or surveys with customers, CBOs, and other stakeholders,
 - Identify opportunities for mid-course process and customer journey improvements, and
 - Compare case management effectiveness across different CBOs and identify factors contributing to efficiency and effectiveness.

¹⁸ Decision Approving Community-Based Organization Arrears Case Management Pilot Program. D. 24-02-046. <https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M525/K668/525668769.PDF>

¹⁹ Membership of the Pilot Implementation Working Group comprises of IOU representatives, Commission staff, and at least one CBO contractor from each service territory, as well as participating CCAs and parties to the R.18-07-005 proceeding.

- Compare the costs of standard utility engagement²⁰ with the costs of CBO pilot engagement (pilot group). The incremental costs attributable to the pilot will be compared to the pilot's benefits.

This evaluation report assesses the effectiveness of the pilot at reducing customer arrears and disconnection events and provides information that will contribute to determining if the pilot should be expanded into a program offering. A secondary objective of the impact evaluation was an assessment of the cost efficiency of the pilot or a comparison of the pilot's implementation costs (including costs incurred by IOU staff and the third-party implementation team) to the benefits or impacts of the pilot. The impact evaluation also explored the pilot's influence on participation in CARE, AMP, and other energy efficiency programs. To accomplish this, the evaluation of the CBO Pilot included a process evaluation and an impact evaluation. The process evaluation findings were presented to the PAs throughout implementation of the pilot. The process report is included as an appendix of this report (Appendix A). The impact evaluation methods, data, and findings are presented below.

²⁰ The large IOUs will report which actions constitute standard utility engagement (for the control group) and the associated costs of standard utility engagement.

3 EVALUATION METHODS

3.1 IMPACT METHODS

This subsection presents the methods used for each portion of the impact analysis, including an arrearage impact analysis, demand side management (DSM) participation analysis, disconnection impact analysis, and cost efficiency analysis.

Arrearage Impact Methodology

The evaluation of the pilot's impacts used a QED and a 2sDiD impact modeling approach. A critical step in the QED is the development of a control group to determine how the pilot impacted the desired outcomes while controlling for macro-economic factors that may have impacted both the participants' and non-participants' ability to reduce their arrearages.

The matched control group was developed using pilot-eligible customers from specified zip codes who had arrears for 90 days or longer who qualified for the pilot but were not contacted by the CBOs (either the CBOs were unsuccessful in contacting these customers or they never attempted to contact them). The evaluation used both stratified propensity score matching (SPSM) and Euclidian distance to identify the best matched controls for each IOU, selecting the best set of matches based on which method produced the match with the most similar attributes. The matching was stratified by IOU, NEM (for PG&E, SCE, and SDG&E), electricity usage (for PG&E, SCE, and SDG&E), and enrollment month. Co-variates used in the SPSM matching process included features calculated based on arrearages, billing, disconnections, and other program enrollment (such as debt reduction or low-income programs like AMP, CARE, ESA, etc.) prior to pilot enrollment. For example, some features used include average pre-participant monthly utility bills and arrearages, incidence of disconnection events, and whether an account was enrolled in CARE. The Euclidean distance matching on the other hand was based on the 12 months of arrearage data prior to enrollment. The matching process selected the best non-participant for each participant. Then, the best model (SPSM or Euclidean distance) was chosen by customer segment.²¹ The best model for each selected matched non-participant control group was validated using a series of comparison steps including visualizations of the match and t-tests to verify the similarity of the participant and matched non-participant co-variates. Matched control group development details and validation checks are presented Section 5.1.

For impact modeling, the monthly arrearage value for the participants and matched control non-participants served as the dependent variable. A post-participation indicator was used to determine pilot

²¹ Segments included IOU, NEM (PG&E, SCE, SDG&E), electric usage (PG&E, SCE, SDG&E), and enrollment month

impacts during the up to 12 month-period following enrollment in which the participants met with CBOs. A 2sDiD regression model was used to estimate the influence of the pilot on the participants' arrearage value.²² The 2sDiD was necessary to account for the rolling enrollment of pilot participants. Some participants enrolled at the beginning of the implementation period, while others enrolled much later. Staggered participation can introduce bias stemming from effect heterogeneity and/or violations of the parallel trends assumption.²³ Bias introduced heterogeneity may occur if early enrollees differ systematically from later enrollees, while the parallel trends assumption requires that treatment and control groups follow similar arrearage trends prior to treatment.

The 2sDiD approach was implemented through the following two steps:

- **Step 1:** Regression model to remove the time and customer account effects from the arrearage data.
- **Step 2:** Standard DiD model estimation using arrearages after removing the first stage estimated time and customer account fixed effect.

The general forms for the two regression steps are described in Equation 3-1 and Equation 3-2 below. As presented Equation 3-1, the first stage model regresses customer account arrearages on account and time-period fixed effects.

EQUATION 3-1: FIRST STAGE - TIME AND CUSTOMER ACCOUNT EFFECTS MODEL

$$A_{gipit} = \gamma_i + \alpha_t + \epsilon_{gipit}$$

Where:

A_{gipit}	The monthly arrearage value for customer i in time t (g is a group indicator for participant/nonparticipant and p is a period indicator for pre-implementation and implementation).
γ_i	The customer account i fixed effect that is constant to the account through time.
α_t	The time period t fixed effect (or the impact of the time period t on all customer account arrearages).
ϵ_{gipit}	The remaining arrears unexplained by the customer and time period fixed effects.

²² If all participants had begun the pilot during the same month, the analysis could have used a DiD model estimated in a single step. The traditional, single step, DiD model's general form is $A_{it} = \beta_1 G_{it} + \beta_2 P_{it} + \beta_3 G_{it} * P_{it}$ where G is a binary (0/1) variable for the participant group, P is a 0/1 variable for the implementation or post-implementation period and $G * P$ is 1 for participants in the implementation or post-implementation period.

²³ The parallel trends assumption is that in the absence of pilot participation, the outcome of pilot participants and their comparison group would have followed similar trends over time. With staggered enrollment, this assumption may be violated if customers who enrolled earlier in the pilot would have experienced different trends in arrears than customers who enrolled later, even in the absence of the pilot. These differences in underlying trends could cause the estimated treatment effect to reflect pre-existing differences in trends rather than the effect of pilot participation.

Prior to the second regression model, the estimated values of the fixed effects are removed from the arrearage values. Removing these fixed effects from the customer and time specific arrearage values controls for heterogeneity and the potential of non-parallel trends in the data due to customers beginning pilot implementation at different dates. The general format for the second stage of the simplified 2sDiD is presented below in Equation 3-2.

EQUATION 3-2: SECOND STAGE - DIFFERENCE-IN-DIFFERENCE IMPACT MODEL

$$A_{gipt} - \hat{\gamma}_i - \hat{\alpha}_t = \beta T_{gipt} + \varepsilon_{gipt}$$

Where:

$\hat{\gamma}_i$	The account specific fixed effect estimated in the first step.
$\hat{\alpha}_t$	The time specific fixed effect estimated in the first step.
$A_{gipt} - \hat{\gamma}_i - \hat{\alpha}_t$	The customer and time specific arrearages without account specific fixed effects (mean value) or time specific fixed effects (mean values).
T_{gipt}	The binary treatment flag for customer i in time t , in group g (participant/non-participant) and pilot period p (where $p = 1$ is the implementation period and $p=2$ is the post-implementation period).
β	The estimated average impact of the pilot.

The analysis estimated the 2sDiD models using the PyFixest package in Python, which is designed to counteract any bias due to heterogeneity of effects associated with staggered enrollment.²⁴

DSM and Other Program Participation Methodology

The evaluation team leveraged program data provided by the utilities to assess the extent to which the pilot influenced DSM and other program enrollment. The evaluation explored the share of pilot participants and matched non-participant customers participating in CARE or FERA, energy efficiency programs (EE, largely ESA), LIHEAP, and AMP using logit models and contingency tables with Chi-square tests. The approach compared program enrollment rates before and after pilot participation. This analysis examined the pre-implementation period versus the implementation period. The analysis also included statistical testing to determine whether observed differences between participant and non-participant groups are statistically significant. For this analysis, participation in CARE or FERA, LIHEAP and AMP were analyzed separately to assess the impact of the pilot on the likelihood of participation in each of these programs individually.

²⁴ The PyFixest 2sDiD model in Python used for this analysis corrects the second stage error structure to account for the fact that the second stage dependent variable is estimated from the first stage specification.

Pilot Cost Efficiency Methodology

The impact evaluation was also tasked with determining the cost efficiency of the pilot. To accomplish this objective, the costs to implement the pilot were compared to the pilot's benefits (dollar value of average arrearage reductions). No Standard Practice Manual (SPM) cost-effectiveness tests were conducted.

3.2 PARTICIPANT SURVEY METHODS

To complement the findings in the impact evaluation, the process team conducted a participant survey after the completion of the pilot. The primary objective of the survey was to evaluate customer perception of the pilot's impact and satisfaction with the pilot. Participants were sent an email invitation to take an online Qualtrics survey and offered an incentive²⁵ for survey completion. Table 3-1 shows the number of participant responses from each CBO and IOU. All survey responses can be found in Appendix C.

TABLE 3-1: SURVEY RESPONSES BY CBO AND IOU

IOU	CBO	Population*	Sample**	Responses	Completes***	Response Rate	Completion Rate
PG&E	CAPK	2,390	2,248	221	134	10%	6%
SCE	CAPSBC	335	277	20	12	7%	4%
	UWTC	58	56	14	9	25%	16%
SoCalGas	FTBMI	154	149	17	3	11%	2%
	SBX	133	119	7	5	6%	4%
SDG&E	MAAC	704	688	73	36	11%	5%
Total		3,774	3,537	352	199	10%	6%

*Population was defined by the impacts team (extensive data cleaning to identify the unique participants within the pilot)

**The sample is smaller than the population because not every participant had a viable email to administer the survey, or the survey email bounced once sent.

***A completed survey is one that reaches all our core questions (i.e., through asking respondents about their satisfaction with the pilot). The stark drop from responses to completes is due to two factors: 1) 52 surveys were screened out due to the respondent not recalling their pilot participation and 2) many respondents answered the first question asking if they remember signing the agreement form for the pilot but did not continue with the survey.

As mentioned above, the evaluation team also previously delivered a comprehensive early process assessment covering outreach, enrollment, and case management.²⁶

²⁵ Respondents were offered a \$20 incentive, but this was increased to \$35 later in the process.

²⁶ See Appendix A.

4 DATA COLLECTION AND CLEANING

This section describes the data collection activities undertaken for the impact evaluation of the CBO Pilot. The evaluation required detailed information from the IOUs, and pilot tracking data from the CBOs. For the impact evaluation, the team collected customer information, arrearages, and billing data from the IOUs. To assess the potential impact of the pilot program on DSM program participation, information on other IOU program participation was collected for pilot-eligible customers (the team requested information on energy efficiency programs, LIHEAP, AMP, CARE and FERA and other arrearage management plans). The IOUs were also asked to provide information on disconnection events. Pilot implementation cost information was also requested from the IOUs. The evaluation team requested pilot tracking data from the CBOs to identify the pilot participants and to assess the number and timing of the meetings with pilot participants.

The pilot-eligible customer population and impact data collection activities are further described below. These sections are followed by a discussion of the necessary data cleaning steps.

4.1 PILOT-ELIGIBLE POPULATION AND ENROLLED CUSTOMERS

Table 4-1 shows the number of pilot-eligible customers by utility and CBO, along with the number of enrolled participants and the final enrollment rate for each pilot. These figures were calculated using pilot-eligible customer lists provided by the IOUs and pilot enrollment dates provided in the CBO tracking data. CAPK achieved the highest enrollment rate at 20%, nearly three times higher than the next-highest CBO, MAAC, at 7%. FTBMI had the lowest enrollment rate at 3%. The process evaluation, in Appendix A, includes information about each CBO's approach to enrollment and why the enrollment rates vary.

TABLE 4-1: ELIGIBLE AND ENROLLED PILOT CUSTOMERS

IOU	CBO	Eligible Customer List	Participant Population	Final Enrollment Rate
PG&E	CAPK	11,840	2,392 ²⁷	20.2%
SCE	CAPSBC	7,385	335	4.5%
	UWTC	1,313	58	4.4%
SoCalGas	FTBMI	4,687	154	3.3%
	SBX	2,565	133	5.2%
SDG&E	MAAC	9,635	704	7.3%
Total		37,425	3,774	10.0%

²⁷ The PG&E participant population includes two more participants than the survey population, because Verdant received data for these two participants after surveys had already gone out.

4.2 IMPACT DATA COLLECTION

The impact evaluation relies on two primary sources of data, the CBO tracking data and information provided by the IOUs. These data sources are summarized in Table 4-2 below.

TABLE 4-2: DATA SOURCES FOR IMPACTS EVALUATION

Data Type	Data Source	Data Contents
CBO Tracking Data	Participating CBOs (CAPK, MAAC, CAPSBC, UWTC, SBX, FTBMI)	Participant enrollment, unenrollment, withdrawal dates, and records of each contact with participants
Utility Data	PG&E, SCE, SDG&E, and SoCalGas	Time-series customer arrearages, billing, disconnection, energy usage, and other program enrollment for the eligible population

The tracking data was received from the participating CBOs and included substantial information on pilot implementation, including enrollment, unenrollment, and withdrawal dates, the outreach measures each CBO used, records of contact with participants, and other details on how the pilot was carried out.

The utility data was received from each utility as time series arrearage, billing, disconnection, energy usage, and other program enrollment records. Each eligible customer's data covered the 12 months before pilot enrollment (December 1, 2023) through May 31, 2026. This data served as the primary input for the matching and impact evaluation models.

4.3 PILOT DATA CLEANING

Prior to the process and impact evaluations, it was necessary for the evaluation team to do a thorough cleaning of both the CBO tracking data sets and the IOU arrearages, billing, disconnection, and other program data. This cleaning process included ensuring that arrearage and billing data were merged onto the CBO tracking data and that the association of arrearage and other program participation data was correctly assigned. We document our cleaning and data merging approach in the following sections below. Learnings from these processes provided critical findings and recommendations for the pilot.

4.3.1 Tracking Data Issues/Cleaning

While the tracking data contained substantial information, much of it could not be used due to quality issues, including inconsistent tracking, missing values, and missing account numbers needed to map participants to utility data. Because the tracking data was self-reported by the CBOs, comparisons across

CBOs were also limited, since recording practices varied and reliability could not be consistently confirmed.

For these reasons, utility data was used exclusively to analyze other program enrollments resulting from the pilot, while tracking data was used only to identify who enrolled in the pilot, when they enrolled, and who unenrolled or withdrew, and when. Unenrollment occurs when a CBO removes a participant, typically due to inactivity or ineligibility, while withdrawal reflects a participant's voluntary exit from the pilot. After a thorough cleaning process, the tracking data ultimately provided a complete list of enrolled, unenrolled, and withdrawn participants for analysis.

4.3.2 Utility Data Issues/Cleaning

The utility data was received from all four utilities and required rigorous cleaning and standardization before use. The following subsections describe, at a high level, the cleaning processes the impacts team applied to each data source.

Arrearage Data

The arrearage data received from each utility differed in format and structure, making standardization an essential analysis step. The impacts team developed a finalized, clean dataset containing monthly arrearage values for each eligible customer account. Creating this dataset required utility-specific processing to account for differences in the files provided by each utility.

For PG&E, two versions of the arrearage data were received each month. The two versions were combined to create the most complete dataset possible. SCE provided a historical file containing monthly arrearages from December 2023 through March 2025, followed by monthly arrearage files for subsequent months. These files were combined into a continuous time series. For SDG&E, a historical file covering December 2023 through February 2025 was provided for all eligible customers, followed by monthly participant and non-participant arrearage files. These files were combined into a single dataset covering the full pre- and post-enrollment periods. For SoCalGas, four files covering different portions of the pre- and post-enrollment periods were received and combined into one finalized arrearage dataset.

After the utility-specific processing was completed, the data were standardized across all utilities. Records containing multiple arrearage entries for the same account and month were consolidated by summing the arrearage amounts, resulting in a single monthly arrearage value for each account.

Billing Data

The billing data received from each utility also differed in format and structure. The impacts team developed a finalized, cleaned billing dataset containing monthly bills for each eligible customer account.

Creating this dataset required utility-specific processing to account for differences in the files provided by each utility.

For PG&E, multiple billing files were combined, giving precedence to the most recent data while using earlier files to fill in missing records. For SCE, a historical billing file was provided, followed by monthly billing files for the remainder of the evaluation period. These files were combined into a single complete dataset. For SDG&E, a historical billing file and two more recent billing files were received and combined after records were deduplicated. For SoCalGas, six billing files with overlapping time periods were received. These files were combined, giving precedence to the most recent data pull.

Unlike the arrearage data, which were already standardized by month, billing records reflected billing periods that often ended on different dates and could span multiple calendar months. To create comparable monthly billing measures across utilities, all billing periods were calendarized. Each bill was allocated across the calendar months it covered based on the proportion of the billing period that fell within each month. The allocated amounts were then summed to produce a single monthly bill amount for each customer.

Energy Usage Data

The energy consumption data also required standardization before it could be used in the analysis. This data was used to classify customers into high, medium, and low usage tiers, as described in Section 3.1. Because energy consumption was included in the billing data, it underwent the same processing steps described above. Records from multiple files were combined and deduplicated for each utility, and energy usage was calendarized to produce consistent monthly values.

The type of usage data provided differed by utility. Consistent with the services they provide, PG&E and SDG&E reported both monthly electricity usage (kWh) and natural gas usage (therms). SCE reported only monthly electricity usage, while SoCalGas reported only monthly natural gas usage. SoCalGas' gas usage data exhibited less variation across customers than electric usage, making usage a less useful variable for segmenting SoCalGas customers. Therefore, matching for SoCalGas was conducted using enrollment cohort only. The Verdant team validated that the resulting matches were sufficiently similar, as shown in Section 5.1, and determined that requesting additional usage data from SoCalGas for matching purposes was not necessary.

Disconnection Data

The disconnection data also differed in format and structure across utilities, requiring standardization before it could be used in the analysis. The information provided varied by utility. For PG&E and SCE, the data included both actual disconnection events and disconnection-related events, such as disconnection notices and reminders. Because these event types were not distinguished in the data provided, they were

retained together in a single disconnection field throughout the analysis. In contrast, SDG&E and SoCalGas provided data on actual disconnection events only.

For PG&E and SCE, disconnection information was included within the arrearage data as the last recorded date of a disconnection or disconnection-related event. Each unique event date was retained for every customer. For SDG&E, a historical file covering the full eligible population was provided, followed by monthly files for enrolled participants and an updated file covering all months for non-participants. These files were deduplicated and combined into a single dataset containing each customer's unique disconnection dates. For SoCalGas, five files with overlapping time periods were received. These files were deduplicated and combined to create one complete dataset of disconnection events covering both the pre- and post-enrollment periods.

Program Data

Verdant received enrollment for participation in other utility programs, including LIHEAP, AMP, CARE, ESA, and other utility-specific energy efficiency programs. The information provided varied by both utility and program, but the key fields were those related to the dates of enrollment. Ideally, the data would have every instance of a start and end date in which an account was enrolled in a program. For programs where customers are active over a period of time (CARE and AMP), missing date fields mattered more than for programs that are active for only a point in time (ESA and LIHEAP). For example, with AMP, it is not only possible, but common for an account to enroll in the program and drop out after a few months for failing to meet the requirements, only to sign up again once the 12-month lockout period passes for these customers. For programs with fewer and longer periods of enrollment, such as CARE, this mattered less, but only slightly. For programs such as LIHEAP²⁸ or ESA, it was important to know only the date of participation (and payment amount, for the former). We detail our treatment of these program enrollment data in far more detail in our discussion of program enrollment and related pilot impacts in the impact results section. For the purpose of this section, the important information is that the impacts team standardized these datasets by deduplicating records, reconciling differences in formatting, and creating a consistent structure that could be used across utilities.

One unique challenge was SCE's AMP data. AMP is designed to help customers eliminate outstanding arrearages by forgiving one-twelfth of the enrolled arrearage balance each month provided that the customer remains current on their utility bill, allowing the full balance to be forgiven after 12 consecutive months of on-time bill payments. For SCE customers, enrollment in AMP resulted in a new account number. Because account numbers were used to link arrearage, billing, program enrollment, and

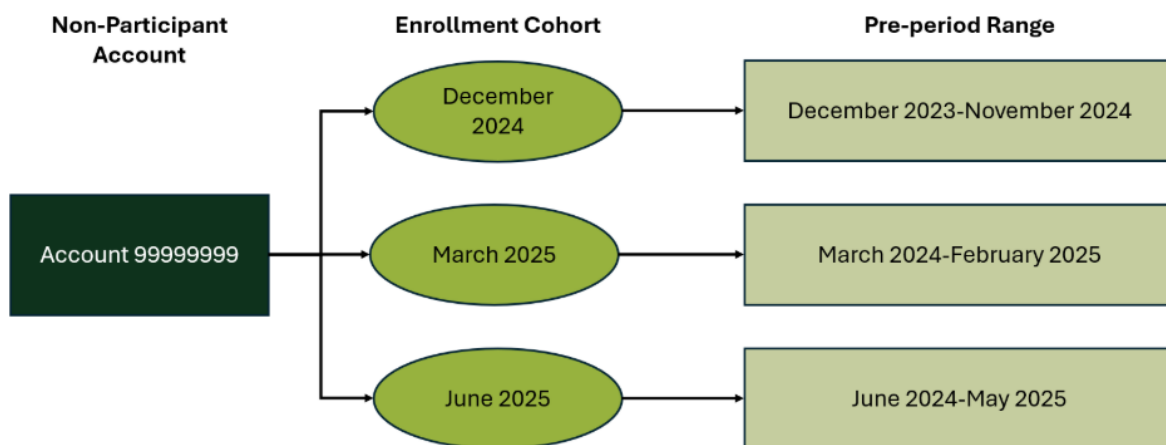
²⁸ For LIHEAP, customers generally apply once per year and, if approved, receive a payment applied directly toward their energy bills. LIHEAP administration can vary by local agency and often changes, so there can be exceptions for crises that can result in multiple payments in a one-year period, though these are rare.

disconnection records, this change broke the connection between a customer's records after their enrollment in AMP. To address this issue, the impacts team mapped each AMP participant's records across both their original and new account numbers, ensuring that all relevant data remained associated with the same customer throughout the analysis.

4.3.3 Non-Participant Data Alignment

Participants enrolled in the pilot between December of 2024 and July of 2025. This staggered enrollment required special treatment of the non-participant data to ensure the proper alignment of data for both developing a control group and estimating pilot impacts. The timing of enrollment in the pilot does not apply to non-participants. However, the non-participants need to be compared to pilot participants using the same time frame associated with pilot enrollment. To ensure this, the impact team aligned the data for the non-participants to match the different participant enrollment cohorts, calculating variables and making comparisons based on the same pre- and post-enrollment timeframes. A simple illustration of this alignment is shown in Figure 4-1, which illustrates how a single non-participant account's data is aligned for three enrollment date cohorts: December 2024, March 2025, and June 2025. The corresponding pre-period for a given enrollment cohort is then used to calculate features for matching, ensuring that each participant and non-participant are being compared on data from the same period.

FIGURE 4-1: ILLUSTRATION OF NON-PARTICIPANT ALIGNMENT



4.4 ACCOUNT ATTRITION

There were two stages to the data cleaning and attrition. The first occurred earlier in the evaluation to support the development of the control group. At the time of the first stage, however, there was not a

complete set of data for the post-enrollment period, so the second stage consisted of attrition associated with producing the final data set used for the impact analysis.

Control Group Development Data Attrition

The evaluation team conducted a rigorous data cleaning process to ensure all data was suitable for analysis. For developing a control group, the participant data covered the 12 months prior to each account's enrollment month in the CBO Pilot. As described previously, each non-participant had its data replicated to match the eight enrollment cohorts, so their data was assessed based on eight distinct 12-month periods.

Data attrition for the development of the control group is reported based on participant accounts removed from the analysis based on the pre-period data. We do not report on non-participant data attrition for two reasons. First, at this point non-participants represent a large pool of candidates for the final control group, so the loss of one account is not of particular concern or consequence. Second, and more importantly, the duplication of the data to match the participant enrollment cohorts complicates the tracking account removal. A non-participant might have had sufficient data when matched to one participant based on enrollment date, but insufficient data when matched to a participant with an earlier or later enrollment date. As a result, the same non-participant could be excluded as a candidate control for one participant while remaining eligible for another. To keep a proper accounting of attrition would require reporting everything by enrollment cohort, which is not necessary for this stage of the analysis.

The data cleaning process for control group development led to the removal of accounts in three stages. A summary of all account removals is presented in

Table 4-3. The detailed stages of data attrition, which correspond to the columns in each table, are as follows:

- Arrearage outliers: Any accounts with over \$10,000 in arrearages or less than -\$500 in arrearages in a given month.
- Insufficient data: Any account with fewer than 12 months of arrearage data in the pre-period.
- The last source of attrition was removing anyone who enrolled in NEM during the post-period along with their match.

TABLE 4-3: DOCUMENTATION OF PRE-PERIOD DATA CLEANING STEPS AND TOTAL PARTICIPANT RECORDS INCLUDED IN ANALYSIS

IOU	Initial Participant Accounts	Total Participant Accounts After Pre-Period Attrition	Total Participant Accounts Removed	Max > \$10k	Min < -\$500	Insufficient Pre Data	Had NEM in the Post-Period
PG&E	2,392	1,866	526	34	49	347	96
SCE	393	301	92	14	0	78	0
SDG&E	704	611	93	12	1	77	3
SoCalGas	287	265	22	0	1	21	0

Impact Analysis Development Data Attrition

The second stage of attrition was based on the preparation of the final set of data to be used to assess impacts. In large part, this consisted of applying the same screens to the post-enrollment data that were applied to the pre-period during control group development, but with one additional nuance. At this point the analysis is based on matched pairs of participants and control accounts. To keep the balance in the study design, if either account in a matched pair is removed due to a data issue, both accounts in the pair need to be removed. For this reason, attrition at this stage is reported in terms of the number of pairs that are removed. The summary of attrition for this stage is presented in Table 4-4.

TABLE 4-4: DOCUMENTATION OF POST-PERIOD DATA CLEANING STEPS AND TOTAL PARTICIPANT RECORDS INCLUDED IN ANALYSIS

IOU	Total Pairs After Matching	Total Pairs After Pre/Post Data Cleaning	Total Pairs Removed	Max > \$10k	Min < -\$500	Insufficient Post Data
PG&E	1,866	1,862	4	2	2	0
SCE	301	238	63	0	0	63
SDG&E	611	606	5	3	2	0
SoCalGas	265	263	2	0	2	0

4.5 EVALUABILITY ASSESSMENT

One key objective underlying the data collection and cleaning steps was to conduct an assessment of the evaluability of the CBO Pilot. This consisted primarily of ensuring the availability and sufficient completeness of the data necessary to answer at least the primary research questions. Verdant deemed the arrearage data to be adequate to address research questions related to arrearage levels and found that data related to the key programs (e.g., AMP and LIHEAP) were sufficient to assess the pilot's impacts. Furthermore, the levels of data attrition were relatively low for a study of this nature, adding additional confidence that the evaluation would not be potentially biased in any way due to the removal of excessive numbers of accounts.

5 CONTROL GROUP DEVELOPMENT AND PARTICIPANT CHARACTERIZATION

The impact evaluation of the CBO Pilot employs a QED, an approach that requires the development of a matched control group. The following section describes the validation of the control group, comparing their features to those of the participant population.

5.1 CONTROL GROUP DEVELOPMENT AND VALIDATION

The matching process paired each participant with the candidate control customer whose pre-enrollment arrearage characteristics most closely resembled their own. To confirm that the resulting control group was sufficiently comparable to the participant population, the evaluation team conducted a formal validation analysis.

The validation involved calculating two-sample t-tests across a broad set of pre-enrollment features, comparing participants against both the final matched non-participant controls and the full pool of CBO Pilot eligible candidates. This allowed the evaluation team to assess not only whether matching reduced the differences in features between the participant and the matched non-participants, but also how the matched non-participant group compared to the unmatched candidate pool as a baseline. Importantly, while matching was performed on a defined subset of features, the validation examined the full feature set to assess balance more comprehensively. The objective was to identify a matched non-participant control group with few or no statistically significant differences from the participant group. Results are summarized in Table 5-1 through Table 5-4, organized by utility and segment and differentiated by whether features relate to pre-period arrears or other attributes. The most critical finding is that the percentage of statistically significant t-tests for matched non-participant controls is low across all segments and feature types, indicating that the matching procedure successfully achieved balance between participants and their matched non-participant controls regardless of the feature category.

The validation results also demonstrate an improvement in standardized mean differences (SMD) following matching. These differences are conventionally classified as small (below 0.2), medium (0.2 to 0.5), or large (above 0.5). All segments exhibit reductions in SMD after matching, reflecting greater similarity between matched controls and participants relative to the full candidate pool.

Additionally, across utilities, the participants who have solar PV had poorer matches relative to participants who do not have solar PV. The evaluation team found that this is likely due to true-up months, which make billing and arrearage shapes harder to match for PV owners.

Table 5-1 shows the control group matching validation results for PG&E. As shown, matching improved

similarity between participants and controls across both arrears-related and non-arrears-related features, relative to the similarity between participants and all eligible customers. For arrears-related features, the percentage of features that were statistically significantly different between participants and controls dropped from 77% to 0% for solar customers and from 85% to 0% for non-solar customers when moving from all eligible customers to matched controls. For non-arrears-related features such as billing and usage, the percentage of statistically significant differences dropped from 68% to 1.8% for solar customers and from 63% to 9.0% for non-solar customers. Standardized mean differences also decreased across all four customer segments, further confirming that matching improved comparability between participants and the control group.

TABLE 5-1: PG&E CONTROL GROUP MATCH VALIDATION

Arrearage Feature	PV Flag	Number of Features	Standardized Mean Difference with Matched Controls	Standardized Mean Difference with Eligible Non-Parts	% Features Statistically Significant for Matched Controls	% Features Statistically Significant for Eligible Non-Parts
Yes	Yes	22	0.070	0.450	0.0%	77%
Yes	No	22	0.043	0.458	0.0%	85%
No	Yes	78	0.196	0.417	1.8%	68%
No	No	78	0.147	0.322	9.0%	63%

Table 5-2 shows the control group matching validation results for SCE. Like PG&E, matching improved the similarity between participants and controls, comparing participants to matched controls versus participants to all eligible customers. For arrears-related features, the percentage of features with statistically significant differences between participants and controls dropped from 53% to 0% for solar customers and from 42% to 0% for non-solar customers. For non-arrears-related features, the percentage of statistically significant differences dropped from 65% to 1.0% for solar customers and from 67% to 2.6% for non-solar customers. Standardized mean differences also decreased across every segment.

Notably, the SMD between matched controls and participants for non-arrears-related features among solar customers remains relatively large (0.533), though it is still an improvement over the comparison with the full eligible population (0.616). The larger differences among solar customers can be partly attributed to true-up months (solar customers receive their electricity bills once a year and these bills could lead to spikes in arrears), which makes it harder to achieve a robust match on arrears-related features for this group.

TABLE 5-2: SCE CONTROL GROUP MATCH VALIDATION

Arrearage Feature	PV Flag	Number of Features	Standardized Mean Difference with Matched Controls	Standardized Mean Difference with All Eligible Non-Parts	% Features Statistically Significant for Matched Controls	% Features Statistically Significant for All Eligible Non-Parts
Yes	Yes	22	0.150	0.622	0.0%	53%
Yes	No	22	0.083	0.346	0.0%	42%
No	Yes	57	0.533	0.616	1.0%	65%
No	No	57	0.341	0.380	2.6%	67%

Table 5-3 shows the control group matching validation results for SDG&E. Like PG&E and SCE, matching reduced the differences between participant and control groups. For arrears-related features, the percentage of statistically significant differences dropped from 43% to 0% for solar customers and from 75% to 0% for non-solar customers. For non-arrears-related features, the percentage of statistically significant differences dropped from 58% to 6.2% for solar customers and from 77% to 3.9% for non-solar customers. SMD also decreased across all customer segments.

The SMD between participants and matched controls remains relatively large for non-arrears-related features among solar customers (0.624), though this is still an improvement over the comparison with all eligible customers (0.686). As with SCE, this is likely due to true-up months, which do not align consistently across solar customers, making it more difficult to find close matches on these features.

TABLE 5-3: SDG&E CONTROL GROUP MATCH VALIDATION

Arrearage Feature	PV Flag	Number of Features	Standardized Mean Difference with Matched Controls	Standardized Mean Difference with All Eligible Non-Parts	% Features Statistically Significant for Matched Controls	% Features Statistically Significant for All Eligible Non-Parts
Yes	Yes	22	0.152	0.385	0.0%	43%
Yes	No	22	0.056	0.308	0.0%	75%
No	Yes	54	0.624	0.686	6.2%	58%
No	No	54	0.199	0.409	3.9%	77%

Table 5-4 shows the control group matching validation results for SoCalGas. For arrears-related features, the percentage of statistically significant differences dropped from 28% to 0% when moving from the comparison with all eligible customers to matched controls. For non-arrears-related features, the percentage of statistically significant differences dropped from 62% to 7.6%. Standardized mean differences also decreased for arrears-related features, from 0.225 to 0.046. For non-arrears-related features, the SMD dropped slightly between matched controls and all eligible customers (0.213 versus

0.211), even though the percentage of statistically significant differences improved substantially with matching.

TABLE 5-4: SOCALGAS CONTROL GROUP MATCH VALIDATION

Arrearage Feature	Number of Features	Standardized Mean Difference with Matched Controls	Standardized Mean Difference with All Eligible Non-Parts	% Features Statistically Significant for Matched Controls	% Features Statistically Significant for All Eligible Non-Parts
Yes	22	0.046	0.225	0.0%	28%
No	33	0.213	0.211	7.6%	62%

It should be noted that the averages reported in Table 5-1, Table 5-2, Table 5-3, and Table 5-4 reflect combined statistics from both the Euclidean distance and propensity score matching (PSM) approaches and exclude any segments with fewer than two participants.

5.2 PRE-ENROLLMENT CHARACTERISTICS

Table 5-5 through Table 5-8 presents SoCalGas's CBO Pilot participant, matched non-participant and eligible non-participant average arrears and average monthly energy bills. Consistent with PG&E and SCE, SoCalGas's CBO Pilot participants averaged higher arrearages and monthly utility bills than eligible non-participants.

Table 5-8 below present arrears and monthly utility bills and energy usage by utility for participants, matched non-participants, and unmatched non-participants that were eligible for the CBO Pilot.

As presented in Table 5-5, the average arrears, prior to pilot enrollment, for PG&E CBO Pilot participants was \$1,628 while the average for PG&E eligible customers was \$1,154, a difference of \$474. PG&E's CBO participants also have substantially larger monthly utility bills and energy usage than the CBO Pilot eligible population pool. The electricity usage of PG&E's CBO Pilot participants averaged 702 kWh per month or 8,424 kWh per year compared to 494 kWh/month or 5,928 kWh/year for the CBO Pilot eligible population. The 2019 California Residential Appliance Saturation Study (CA RASS) found that the average annual electricity consumption for PG&E households was 6,266 kWh. Therefore, the electricity consumption of CBO Pilot participants is substantially higher than PG&E's average and may help to explain the high arrearages observed among participants.

TABLE 5-5: PG&E PRE-ENROLLMENT CHARACTERISTICS

Group	N	Average Arrears	Median Arrears	Average Monthly Bill	Average Monthly kWh	Average Monthly Therms
Participants	1,866	\$1,628	\$1,282	\$288	702	31
Matched Non-Participants	1,866	\$1,628	\$1,267	\$286	692	29
Unmatched Non-Participants	55,345	\$1,154	\$792	\$234	494	28

Table 5-6 presents the average arrearages, utility bills, and electricity usage of SCE CBO participants, their matched non-participants, and the unmatched eligible population. SCE's CBO Pilot participants' average arrears was approximately \$330 higher than the arrearages of the unmatched eligible population while the average monthly utility bills of pilot participants and the unmatched eligible population are very similar. The average energy usage of CBO Pilot participants was 649 kWh/month or 7,878 kWh/year compared to 562 kWh/month or 6,744 kWh/year for eligible non-participants. The annual energy usage of participants, matched non-participants, and eligible non-participants exceeds the average SCE household's electricity usage of 6,424 kWh (from the 2019 CA RASS). Similar to PG&E, the high electricity usage by the eligible pilot population could be a factor in their arrears.

TABLE 5-6: SCE PRE-ENROLLMENT CHARACTERISTICS

Group	N	Average Arrears	Median Arrears	Average Monthly Bill	Average Monthly kWh
Participant	301	\$1,567	\$1,090	\$169	649
Matched Non-Participant	301	\$1,515	\$1,067	\$174	627
Unmatched Non-Participant	41,529	\$1,232	\$730	\$161	562

Table 5-7 shows the average arrears, bills, and usage for SDG&E's CBO participants, matched non-participants, and eligible population. SDG&E's participants had average arrears approximately \$100 higher than their non-participants in the pre-period, and their utility bill was approximately \$10 higher. SDG&E's CBO participants had an average of 343 kWh/month or 4,112 kWh/year compared to 305 kWh/month or 3,660 kWh/year for eligible non-participants. Both participants and eligible non-participants have lower energy usage than the average SDG&E household's electricity of 5,230 kWh (from the 2019 CA RASS). The finding that the average CBO Pilot participant's electricity usage is lower than the average SDG&E household stands out relative to the other electricity providing IOUs where utility usage for CBO Pilot participants was higher than average customers. In addition, the average utility monthly bill for SDG&E CBO eligible customers is substantially lower than for either PG&E or SCE eligible customers. This finding is somewhat surprising given the SDG&E's monthly utility bills include both electricity and gas while SCE's

represent only electricity consumption. The relatively low monthly utility bills, however, have not kept these customers from accumulating substantial arrears.

TABLE 5-7: SDG&E PRE-ENROLLMENT CHARACTERISTICS

Group	N	Average Arrears	Median Arrears	Average Monthly Bill	Average Monthly kWh	Average Monthly Therms
Participant	611	\$1,341	\$902	\$118	343	18
Matched Non-Participant	611	\$1,332	\$876	\$117	333	18
Unmatched Non-Participant	59,079	\$1,248	\$782	\$108	305	17

Table 5-8 presents SoCalGas's CBO Pilot participant, matched non-participant and eligible non-participant average arrears and average monthly energy bills.²⁹ Consistent with PG&E and SCE, SoCalGas's CBO Pilot participants averaged higher arrearages and monthly utility bills than eligible non-participants.

TABLE 5-8: SOCALGAS PRE-ENROLLMENT CHARACTERISTICS

Group	N	Average Arrears	Median Arrears	Average Monthly Bill
Participant	265	\$924	\$644	\$55
Matched Non-Participant	265	\$930	\$645	\$50
Unmatched Non-Participant	45,352	\$765	\$423	\$48

²⁹ Verdant deemed that gas usage was not critical for the identification of a control group and did not request additional energy usage data from SoCalGas.

6 PROGRAM IMPACT EVALUATION

This chapter describes the results of analysis conducted to assess the pilot impacts on arrearages and participation in other utility programs. Details on the specific methods employed are provided in detail in Section 3.1 of this document, though additional explanations are provided where necessary to help better understand the information presented.

6.1 ARREARAGE LEVELS

As a means of establishing some baseline expectations, Table 6-1 presents the average arrears in the post-enrollment period for the final set of participants and their matched control groups, along with the average decrease in arrears relative to the year prior to enrollment. These are not estimated impacts but represent summaries of the data provided to conduct the analysis.

TABLE 6-1: CHANGES IN ARREARAGE STATUS OVER THE COURSE OF THE PILOT IMPLEMENTATION

IOU	CBO	Mean Arrears for the Post-Pilot Period		Change in Mean Arrears from Pre- to Post-Pilot Periods	
		Participants	Matched Non-Participants	Participants	Matched Non-Participants
PG&E	CAP-K	\$1,387	\$1,311	-\$238	-\$314
SCE	CAPSBC	\$1,256	\$1,701	-\$345	\$123
	UWTC	\$2,097	\$1,653	\$414	\$36
SDG&E	MAAC	\$1,164	\$1,093	-\$154	-\$227
SoCalGas	FTBMI	\$809	\$708	-\$59	-\$148
	SBX	\$812	\$879	-\$190	-\$136
Total		\$1,254	\$1,224	-\$95	-\$158

As Table 6-1 shows, all groups exhibited a decline in their arrears in the post-period except CAPSBC's non-participants and UWTC's participants and non-participants. To determine whether the changes in arrears represented meaningful pilot impacts, Verdant employed a two-stage DiD methodology, the results of which are presented in the next section.

6.2 ARREARAGE IMPACTS

We present our evaluation of the CBO Pilot on participant arrearages below.

6.2.1 Overall Impact

We estimated two-stage DiD (2sDiD) models at multiple levels of aggregation (by CBO, NEM vs. Non-NEM, and Unenrolled status). The 2sDiD estimate represents the magnitude (in \$) of the pilot's effect on participant arrearages. Table 6-2 presents the 2sDiD results by CBO. As this table shows, CAPSBC, in SCE's territory, was the only CBO whose interventions resulted in a statistically significant reduction in arrearages (based on the p -values associated with the models), with an average estimated effect of $-\$495.24$ (represented by the 2sDiD coefficient) per CBO Pilot participant.³⁰ Estimates for all other CBOs were not statistically distinguishable from zero, indicating no reliable evidence exists that the pilot affected participants arrearages.

TABLE 6-2: TWO-STAGE DID RESULTS BY CBO

IOU	CBO	Two-Stage DiD Estimate	Standard Error	p -value*	Count	Mean Participant Arrears Pre	Mean Participant Arrears Post	Mean Control Arrears Pre	Mean Control Arrears Post
PG&E	CAP-K	50.14	36.84	0.1735	1,862	\$1,625	\$1,387	\$1,625	\$1,311
SCE	CAPSBC	-495.24	80.08	0.0000	203	\$1,601	\$1,256	\$1,578	\$1,701
	UWTC	326.80	244.18	0.1810	35	\$1,683	\$2,097	\$1,617	\$1,653
SDG&E	MAAC	74.74	48.52	0.1235	606	\$1,318	\$1,164	\$1,320	\$1,093
SoCalGas	FTBMI	81.75	69.41	0.2389	142	\$859	\$809	\$856	\$708
	SBX	-53.35	94.04	0.5705	121	\$1,002	\$812	\$1,015	\$879

*a p -value of < 0.05 indicates statistical significance

6.2.2 Impact by NEM Status

A substantial share of electric or dual fuel utility CBO Pilot participants have a behind-the-meter solar system installed and are on a Net Energy Metering (NEM) tariff (approximately 24% of participants for PG&E and SCE and 11% of SDG&E). NEM customers may be less likely to accrue substantial arrearages due to their reduced utility consumption and their ability to sell electricity back to their utility. Additionally, their NEM status may make them less aware that they are accumulating a substantial utility bill until they receive their annual true-up.

Table 6-3 shows the 2sDiD results and presents participant and control groups mean arrearage levels by NEM status.³¹ The 2sDiD models found that only SCE's non-NEM participants had a statistically significant reduction in arrears from CBO Pilot participation. This segment saw arrearages decrease by an estimated \$382.32 relative to their control group. It is worth noting that for SCE's NEM customers, there is more volatility in arrearages due to the annual true up and the number of customers is much smaller, both of

³⁰ Information on CAPSBC's approach, and how it differed from the other CBOs, can be found in the process evaluation (Appendix A).

³¹ SoCalGas' SoCalGas' results are not presented because they do not have a NEM status.

which could have contributed to the lack of statistical significance despite the similar model coefficients (2sDiD estimates).

TABLE 6-3: TWO-STAGE DID RESULTS BY NEM STATUS

IOU	NEM Status	Two-Stage DiD Estimate	Standard Error	*	Count	Mean Participant Arrears Pre	Mean Participant Arrears Post	Mean Control Arrears Pre	Mean Control Arrears Post
PG&E	NEM	-9.76	76.75	0.8988	368	\$1,350	\$1,358	\$1,332	\$1,332
	Non-NEM	66.21	41.42	0.1099	1,494	\$1,693	\$1,394	\$1,698	\$1,306
SCE	NEM	-357.01	228.45	0.1183	45	\$2,172	\$1,919	\$2,007	\$2,098
	Non-NEM	-382.32	81.37	0.0000	193	\$1,483	\$1,249	\$1,485	\$1,600
SDG&E	NEM	-91.38	154.11	0.5532	62	\$1,398	\$1,058	\$1,406	\$1,158
	Non-NEM	93.82	51.04	0.0660	544	\$1,309	\$1,176	\$1,310	\$1,085

*a p-value of < 0.05 indicates statistical significance

6.2.3 Impact by Unenrolled Status

The CBO Pilot was designed to provide participants with case management for a year following enrollment, however, some participants chose to withdraw from the pilot, while others stopped responding to CBO outreach prior to completion of the case management services and were thus unenrolled from the pilot by the CBO. We estimated 2sDiD models by IOU and enrollment status to determine the impact of withdrawing or being unenrolled in the pilot on participant arrearages (Table 6-4). Three customer segments were found to have statistically significant results:

- SCE participants who remained in the pilot (i.e., did not unenroll) had a \$359.45 reduction in arrearages ($p < 0.001$) compared to their control, the largest and most precise effect in the table.
- Participants that remained in PG&E's CBO Pilot were found to have a small, but statistically significant increase in arrearages of \$78.00 ($p = 0.042$).
- Participants who unenrolled from SDG&E showed a significant increase in arrearages of \$162.01 ($p = 0.021$).

All other segments were not statistically distinguishable from zero. These findings are inconsistent and may imply that there are many reasons why CBO Pilot participants unenrolled in the pilot and that the various rationales for unenrollment may have led to different outcomes by utility and enrollment status.³²

³² See Appendix C for customer experience survey results asking participants why they stopped engaging with their case manager.

TABLE 6-4: TWO-STAGE DID RESULTS BY UNENROLLED STATUS

IOU	Unenrolled Status	Two-Stage DiD Estimate	Standard Error	p-value	Count	Mean Participant Arrears Pre	Mean Participant Arrears Post	Mean Control Arrears Pre	Mean Control Arrears Post
PG&E	No	78.00	38.42	0.0423	1,695	\$1,613	\$1,409	\$1,611	\$1,302
	Yes	-225.48	127.76	0.0776	167	\$1,742	\$1,158	\$1,776	\$1,405
SCE	No	-359.45	80.22	0.0000	224	\$1,563	\$1,336	\$1,523	\$1,630
	Yes	-653.64	374.28	0.0812	14	\$2,413	\$1,992	\$2,563	\$2,737
SDG&E	No	-1.37	66.53	0.9836	326	\$1,241	\$980	\$1,297	\$1,039
	Yes	162.01	70.02	0.0207	280	\$1,407	\$1,377	\$1,347	\$1,155
SoCalGas	No	33.45	59.64	0.5749	248	\$924	\$828	\$940	\$801
	Yes	-267.35	201.70	0.1854	15	\$941	\$515	\$743	\$573

Details on the case management strategies used to combat arrearages, which varied by CBO, can be found in the early process evaluation (see Appendix A).

6.3 OTHER PROGRAM PARTICIPATION

While arrearage reduction was the primary focus of the CBO Pilot and the impact analysis, the pilots were intended to provide CBO Pilot participants with information on other programs designed to help reduce energy usage, energy bills, and/or help customers pay their utility bills and decrease their arrearages. The programs the pilot provided information and guidance on to help address arrearages included CARE, AMP, LIHEAP, and ESA. Verdant characterized participation in these programs by CBO participation to better understand the impact of the pilot on enrollment in other programs.

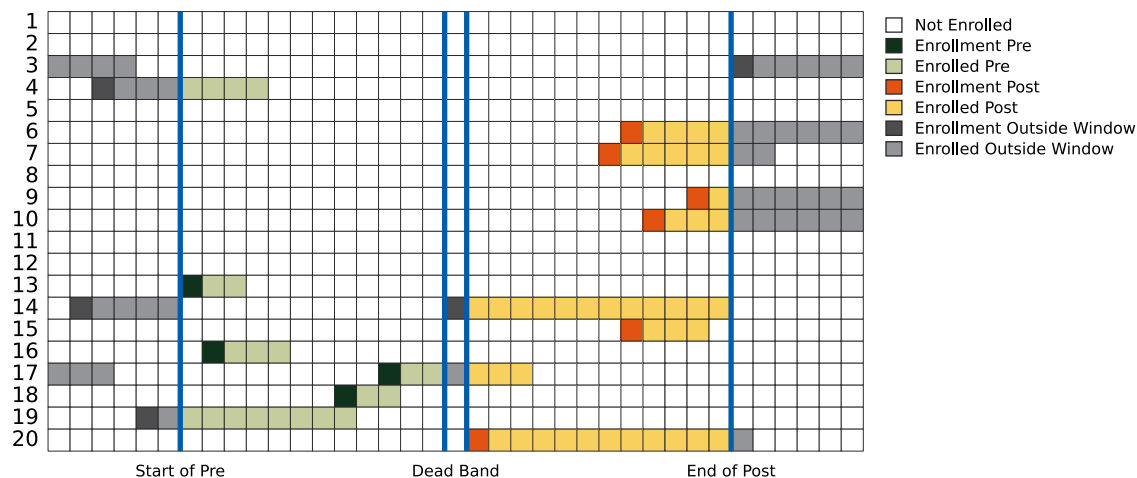
We compared activity in these other programs before and after enrollment in CBO. Our definition of activity depended on the nature of the data provided. For programs with start and end dates, Verdant used these dates to determine two types of program status variables in the time series data we developed for the analysis. The first is “enrolled,” which is an indicator for the specific month in which a customer signed up for the program. The second is “active,” which is an indicator in any month between the start and end dates (inclusive). The distinction is important and there is value in both variables, but there are many nuances that can be difficult to follow.

To help understand how we defined these variables, Figure 6-1 shows an example for 20 pilot participants (assigned to a number but randomly selected) for the AMP program. The pre, post, and dead band periods (month when the customer enrolled in the pilot) are delineated by vertical blue lines and each month in the grid is color coded to a different status based on the start and end dates provided by the IOU. Any

accounts with no colored squares in the grid were not involved with the AMP program based on the data we received.

To ascertain whether the pilot might have influenced participation, our focus is on accounts that have no activity – no colored boxes – in the pre-period window paired with any activity in the post window. This approach does account for cases that enrolled before the start of the pre-period window and were still active into that window, but any activity that took place exclusively outside of the start of the pre-period and the end of the post is not accounted for in the subsequent summaries and analysis. We made this decision because the inconsistent availability of data outside of our pre- and post-windows could have potentially biased the results based on their participation date.

FIGURE 6-1: EXAMPLE OF PROGRAM ENROLLMENT AND ACTIVE DATES FOR AMP



For programs with only one date (LIHEAP and ESA), enrollment and active flags were the same.

6.3.1 CARE Enrollment

This section summarizes the enrollment in CARE for pilot participants and their matched controls. As CARE reduces customer bills, it is plausible to hypothesize that enrollment onto this rate may assist in reducing arrears. We provide the following analyses and information to assess the relationship between CARE enrollment and arrearage reduction for participants and their matched controls.

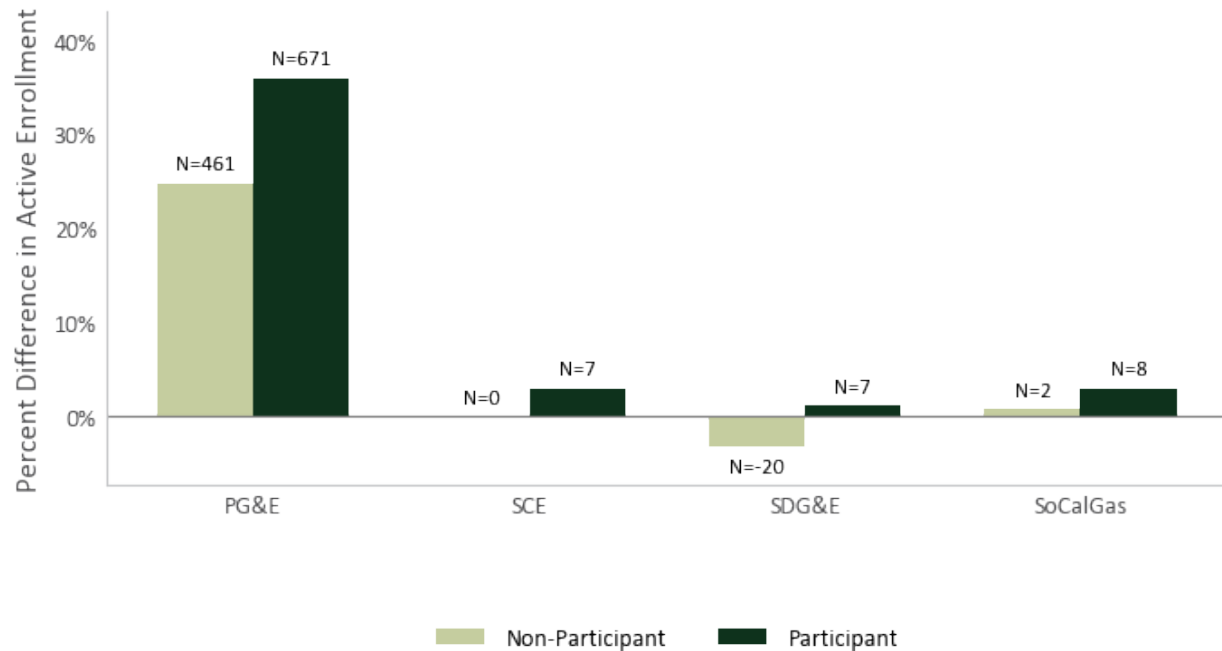
CARE enrollment varied by IOU during the pre- and post-enrollment periods:

- PG&E:
 - 53% of participants enrolled in CARE in pre → 89% enrolled post-period
 - 56% of non-participants enrolled in CARE in pre → 80% enrolled post-period

- SCE:
 - 90% of participants enrolled in CARE in pre → 93% enrolled post-period
 - 71% of non-participants enrolled in CARE in pre → 71% enrolled post-period
- SDG&E:
 - 87% of participants enrolled in CARE in pre → 88% enrolled post-period
 - 76% of non-participants enrolled in CARE in pre → 72% enrolled post-period
- SoCalGas:
 - 89% of participants enrolled in CARE in pre → 92% enrolled post-period
 - 76% of non-participants enrolled in CARE in pre → 77% enrolled post-period

Figure 6-2 shows the percentage-point change in CARE active enrollment from the pilot pre-period to the post-period, by CBO Pilot participation status. As PG&E had the lowest pre-enrollment CARE numbers, they show the largest shift in CARE enrollment for both participants and non-participants, with a 36-percentage point increase among participants (671 CBO participants enrolled in CARE in the post-pilot period) and a 25-percentage point increase among non-participants (or an increase of 461 non-participants). SCE showed no change in the number of active non-participants and a gain of seven active participants. SDG&E showed a slight decline in the number of non-participants active in CARE (-20) alongside a small increase in participants active in CARE (+7).

FIGURE 6-2: PERCENTAGE-POINT CHANGE IN CARE ENROLLMENT BY UTILITY FOR CBO PARTICIPANTS AND NON-PARTICIPANTS



We analyzed changes in arrears by CARE enrollment status for pilot participants and non-participants. Table 6-5 provides a summary of the counts and average arrears for PG&E’s CBO Pilot participants and non-participants based on their pre- and post-CARE enrollment status. The table shows a decrease in arrears for all groups, regardless of pre- and post-CARE enrollment status.

TABLE 6-5: PG&E ARREARS SUMMARY BY ACTIVE CARE AND CBO PILOT STATUS

CBO Participant Status	Active CARE Pre	Active CARE Post	Count	Mean Arrears Pre	Mean Arrears Post	Mean Months Active CARE Pre	Mean Months Active CARE Post
Matched Non-Participant	No	No	299	\$1,610	\$1,361	0.0	0.0
		Yes	528	\$1,793	\$1,716	0.0	7.5
	Yes	No	67	\$1,963	\$1,228	7.4	0.0
		Yes	968	\$1,516	\$1,081	9.5	11.1
Participant	No	No	166	\$1,722	\$1,467	0.0	0.0
		Yes	707	\$1,682	\$1,588	0.0	7.3
	Yes	No	36	\$1,823	\$1,655	7.7	0.0
		Yes	953	\$1,558	\$1,214	8.7	11.2

Table 6-6 provides a summary of the counts and average arrears for SCE’s CBO Pilot participants and non-participants based on their pre- and post-CARE status. The small number of SCE customers joining or leaving the CARE rate during the CBO post-enrollment period makes it difficult to identify any impact of CARE rate changes on arrearages, though CBO participants and non-participants who discontinue their CARE participation appear to have a slight increase in their arrears.

TABLE 6-6: SCE ARREARS SUMMARY BY ACTIVE CARE AND CBO PILOT STATUS

CBO Participant Status	Active CARE Pre	Active CARE Post	Count	Mean Arrears Pre	Mean Arrears Post	Mean Months Active CARE Pre	Mean Months Active CARE Post
Matched Non-Participant	No	No	51	\$1,256	\$1,059	0.0	0.0
		Yes	17	\$1,373	\$1,250	0.0	8.1
	Yes	No	17	\$1,276	\$1,373	9.8	0.0
		Yes	153	\$1,751	\$1,995	11.2	11.3
Participant	No	No	7	\$2,387	\$2,828	0.0	0.0
		Yes	17	\$2,016	\$1,731	0.0	10.3
	Yes	No	10	\$1,306	\$1,508	10.7	0.0
		Yes	204	\$1,568	\$1,291	10.9	11.5

Table 6-7 provides a summary of the counts and average arrears for SDG&E’s CBO Pilot participants and non-participants based on their pre- and post-CARE status. The typical CBO participant who joined CARE for the first time in the post-period participated in CARE for 8.4 months while their matched non-participants averaged only 7.5 months of participation. CBO participants and their matched non-participants who moved to CARE during the CBO post-enrollment period averaged only \$28 in arrearage reduction, far less than other groups.

TABLE 6-7: SDG&E ARREARS SUMMARY BY ACTIVE CARE AND CBO PILOT STATUS

CBO Participant Status	Active CARE Pre	Active CARE Post	Count	Mean Arrears Pre	Mean Arrears Post	Mean Months Active CARE Pre	Mean Months Active CARE Post
Matched Non-Participant	No	No	121	\$1,211	\$1,112	0.0	0.0
		Yes	26	\$2,023	\$2,014	0.0	7.5
	Yes	No	46	\$1,486	\$757	11.0	0.0
		Yes	413	\$1,289	\$1,075	10.7	9.7
Participant	No	No	49	\$1,319	\$1,145	0.0	0.0
		Yes	32	\$1,133	\$1,090	0.0	8.4
	Yes	No	25	\$1,594	\$971	10.8	0.0
		Yes	500	\$1,316	\$1,183	10.5	9.8

SoCalGas’s summary of arrears by pilot and CARE participation status are shown in Table 6-8. In the post-period, there was a small net increase in CARE participation with two matched non-participants joining

CARE and eight participants joining CARE. Across all customer segments, there was a net decrease in average arrears from the pre- to post-period.

TABLE 6-8: SOCALGAS ARREARS SUMMARY BY ACTIVE CARE AND CBO PILOT STATUS

CBO Participant Status	Active CARE Pre	Active CARE Post	Count	Mean Arrears Pre	Mean Arrears Post	Mean Months Active CARE Pre	Mean Months Active CARE Post
Matched Non-Participant	No	No	49	\$1,090	\$819	0.0	0.0
		Yes	14	\$829	\$622	0.0	8.8
	Yes	No	12	\$970	\$838	8.2	0.0
		Yes	188	\$892	\$794	11.0	10.5
Participant	No	No	16	\$667	\$599	0.0	0.0
		Yes	14	\$1,203	\$864	0.0	10.1
	Yes	No	6	\$1,159	\$1,042	7.3	0.0
		Yes	227	\$919	\$828	11.3	10.9

These arrearage findings for all four IOUs do not support the hypothesis that enrolling in the CARE rate reduced customer arrearages.

Pilot Impacts on CARE Enrollment

The section above presents data on the number of CBO participants and their matched non-participants enrolled on the CARE rate. The following subsection presents findings from the assessment of the impact of the CBO Pilot on CARE enrollment during the pilot's post-enrollment period. Verdant used two approaches to assess the pilot's impact on participation in CARE and other programs. The first was to use a contingency table to compare the frequencies of CBO participants and matched non-participant controls that enrolled in the other program in the post-period after being inactive in the pre-period. These contingency table frequencies allow one to assess whether the number of pilot participants that enrolled in the other program is markedly higher than expected, which can be tested for significance using a Chi-square statistic.

The second approach uses a logit model to predict enrollment in the other program in the post-period as a function of CBO pilot participation and other program pre-period activity. This second term controls for those customers that had been active in the other program previously, which is strongly correlated to enrollment in the other program in the post-period. Incorporating the binary variable indicating other program enrollment in the pre-period, enabled the logit model to estimate the impact of the CBO Pilot on other program enrollment while maintaining the balance of pilot participants and matched non-participant controls.

Both approaches to estimating the impact of CBO Pilot participation on other program participation result in similar conclusions with respect to the pilot impacts, but the two approaches have different advantages when it comes to interpretation of the results. For the contingency table, the advantages are its transparency and ease of interpretation. One can easily compare the observed and expected frequencies, combined with the Chi-square statistic, to understand how the pilot influenced other program participation. The logit model, in contrast, results in a single coefficient that reflects the pilot's influence on log odds, which beyond its sign and statistical significance is not as easily interpreted. However, the logit model's results can also be used to calculate specific scenario probabilities of other program enrollment as well as the average marginal effect, which shows the increase in percent likelihood of other program enrollment.

For the sake of brevity, we will present only one set of results (the logit model) for the remaining analyses. However, the contingency tables are presented in Appendix D.

The logit model results for PG&E enrollment in CARE are presented in Table 6-9. For all logit tables presented, the average marginal effects that are statistically significant will be highlighted in green. The information provided in the table requires detailed explanation, which will help with understanding all other logit model results presented in this section.

TABLE 6-9: PG&E LOGIT MODEL FINDINGS FOR CARE ENROLLMENT POST CBO PILOT

CBO Participant Status	Active CARE Pre	Count	CARE Predicted Enrollment Probability
Matched Non-Participant	No	827	59.8%
	Yes	1,035	11.8%
Participant	No	873	73.5%
	Yes	989	19.9%
Impact Coefficient: 0.6251, Std. Error: 0.0802, <i>p</i> -value: 0.0000			
Average Marginal Effect: 0.1072			

The key result from the logit model is the coefficient for the variable representing CBO Pilot participation, which in this case reflects the pilot's impact on CARE program enrollment. This coefficient is presented in row five of the table (Impact Coefficient), and the positive value indicates that pilot participation increased the likelihood of CARE enrollment in the post-period. The standard error, *t*-statistic, and *p*-value point to the statistical significance of the coefficient.

The coefficient represents a change in log odds, which indicate the direction of impacts and their statistical significance but is not otherwise intuitive or easy to interpret. To better understand the logit model results, we translate the coefficients CARE enrollment probabilities for the different scenarios or permutations associated with the model's independent variables. The third row in Table 6-9, shows that PG&E's CBO Pilot participants who were not previously active in CARE have a 73.5% chance of enrolling in

CARE in the post-period, the highest of any scenario and nearly 14 percentage points higher than the CBO non-participants' likelihood of enrolling if they were not already active in CARE. Additionally, the Average Marginal Effect (AME) is presented, which represents the average of individual marginal effects across the sample. In this case, the model shows that PG&E's CBO Pilot participation is associated with a 10.7 percentage point increase in the probability of CARE enrollment in the post-period, holding pre-period program activity constant.

For the remaining results in this section, we present the logit model results over the contingency tables for two reasons. First, the direct estimation of impact based on the participant status provides a more direct way of addressing the key research question. Second, we feel that predicted probabilities and AME provide the reader with a more readily interpretable means of assessing the nature of the impacts.

Table 6-10 shows how participation in the CBO Pilot translates into CARE enrollment for SCE using the logit model coefficients for the different scenarios or permutations associated with the model's independent variables. The third row shows that SCE's CBO Pilot participants who were previously not active in CARE have a 35.5% chance of enrolling in CARE in the post-period, the highest of any scenario and nearly seven percentage points higher than the CBO non-participants' likelihood of enrolling if they were not already active in CARE. The fifth row of Table 6-10, however, presents the logit model's impact parameter estimate for the estimated effect of the CBO Pilot on CARE enrollment in the post-period, its standard error, and the *p*-value. These statistics indicate that the logit model found that the CBO Pilot did not lead to a statistically significant increase in CARE enrollment for SCE's CBO participants.

TABLE 6-10: SCE LOGIT MODEL FINDINGS FOR CARE ENROLLMENT POST CBO PILOT

CBO Participant Status	Active CARE Pre	Count	CARE Predicted Enrollment Probability
Matched Non-Participant	No	68	27.2%
	Yes	170	5.0%
Participant	No	24	35.5%
	Yes	214	7.2%

Impact Coefficient: 0.3897, Std. Error: 0.332, *p*-value: 0.2402

Average Marginal Effect: 0.0340

Table 6-11 shows findings from the analysis of SDG&E's CBO Pilot's impact on CARE enrollment using the logit model coefficients for the different scenarios or permutations associated with the model's independent variables. The fifth row of the table presents the logit model's impact coefficient for the effect of CBO Pilot participation on the likelihood of CARE enrollment in the CBO's post-enrollment period. The statistics presented in the fifth-row show that for SDG&E's CBO Pilot participants, pilot participation led to a statistically significant increase in the likelihood of CARE enrollment. The third row shows that SDG&E's CBO Pilot participants who were previously not active in CARE had a 28.1% chance of enrolling in CARE in the post-period, the highest of any scenario and over 10 percentage points higher than the CBO

non-participants' likelihood of enrolling if they were not already active in CARE. Additionally, the AME of the model shows that SDG&E's CBO Pilot participation is associated with a 6.95 percentage point increase in the probability of CARE enrollment in the post-period, holding pre-period program activity constant.

TABLE 6-11: SDG&E LOGIT MODEL FINDINGS FOR CARE ENROLLMENT POST CBO PILOT

CBO Participant Status	Active CARE Pre	Count	CARE Predicted Enrollment Probability
Matched Non-Participant	No	147	17.8%
	Yes	459	9.1%
Participant	No	81	28.1%
	Yes	525	15.3%
Impact Coefficient: 0.5886, Std. Error: 0.172, <i>p</i> -value: 0.0006			
Average Marginal Effect: 0.0695			

Table 6-12 shows the logit model findings for enrollment in CARE in the post-period for SoCalGas participants and matched non-participants. The predicted probability for SoCalGas participants and matched non-participants who were active in CARE in the pre-period to enroll in the post-period were very similar (4.7% and 4.5%, respectively). Among those not active in CARE during the pre-period, predicted probabilities of enrolling in the post-period were also comparable (19.9% vs. 19.1%). In line with these results, the model indicates no statistically significant pilot impact on CARE enrollment for SoCalGas.

TABLE 6-12: SOCALGAS LOGIT MODEL FINDINGS FOR CARE ENROLLMENT POST CBO PILOT

CBO Participant Status	Active CARE Pre	Count	CARE Predicted Enrollment Probability
Matched Non-Participant	No	63	19.1%
	Yes	200	4.5%
Participant	No	30	19.9%
	Yes	233	4.7%
Impact Coefficient: 0.0545, Std. Error: 0.355, <i>p</i> -value: 0.8781			
Average Marginal Effect: 0.0035			

Summarizing our analysis of CARE enrollment and the impact of the CBO Pilot on enrollment in the low-income rate:

- PG&E's data shows a substantial increase in CARE enrollment during the CBO post-period for both pilot participants and their matched non-participants. The logistic analysis of the CBO Pilot's impact on CARE found that the pilot led to a statistically significant increase in CARE enrollment.
- The analysis found that SDG&E's CBO Pilot led to a statistically significant increase in CARE enrollment relative to the pre-period and the enrollment of the matched non-participants.
- The logistic analysis of SCE's and SoCalGas' CBO Pilot found no statistically significant impact of the pilot on CARE enrollment.

6.3.2 AMP Enrollment

This section summarizes the enrollment in AMP for pilot participants and their matched controls.³³ AMP is a utility program designed to help customers learn to pay their utility bill on time and reduce and eliminate their outstanding arrears. We provide the following analyses and information to assess the relationship between AMP enrollment and arrearage reduction for participants and their matched controls.

AMP enrollment varied by IOU during the pre- and post-enrollment periods:

- PG&E:
 - 36% of participants were enrolled in AMP in pre → 52% enrolled post-period
 - 36% of non-participants were enrolled in AMP in pre → 44% enrolled post-period
- SCE:
 - 13% of participants were enrolled in AMP in pre → 28% enrolled post-period
 - 13% of non-participants were enrolled in AMP in pre → 21% enrolled post-period
- SDG&E:
 - 25% of participants were enrolled in AMP in pre → 38% enrolled post-period
 - 27% of non-participants were enrolled in AMP in pre → 33% enrolled post-period
- SoCalGas:
 - 51% of participants were enrolled in AMP in pre → 42% enrolled post-period
 - 44% of non-participants were enrolled in AMP in pre → 27% enrolled post-period

Figure 6-3 shows the percentage-point change in AMP active enrollment from the pilot pre-period to the post-period, by CBO participation status. For PG&E, SCE, and SDG&E, CBO Pilot participant groups show a larger increase in AMP enrollment than non-participant groups. While all three electric and both dual fuel utilities have a larger increase in AMP participation among CBO participants than non-participants, it is important to note that AMP participation is increasing among both groups of CBO eligible customers which may imply that utility education and marketing of the AMP program to customers with arrears is driving the increase in AMP participation.

³³ There were significant data issues with the pre-period AMP enrollment data for SoCalGas, therefore additional data has been requested, and their AMP enrollment is not included in this report.

FIGURE 6-3: PERCENTAGE-POINT CHANGE IN AMP ENROLLMENT BY UTILITY FOR CBO PILOT PARTICIPANTS AND NON-PARTICIPANTS

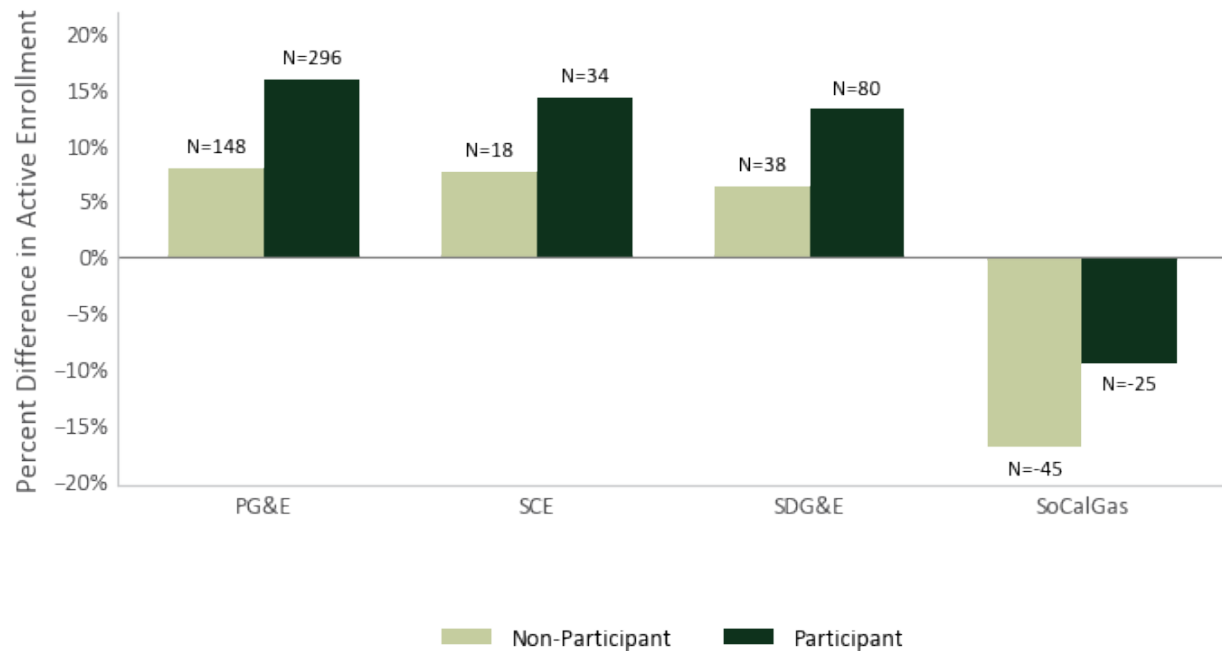


Table 6-13 shows a summary of arrears by AMP active status for PG&E. As shown, both participants and non-participants increased their AMP enrollment, with 36% of participants in the CBO Pilot enrolled in AMP in the pre-period growing to 52% in the post-period, and 36% of matched non-participants growing to 44% in the post-period.

For customers who were active in AMP in the pre-period and inactive in the post-period, arrears decreased by an average of \$938. This suggests that many of the customers who were enrolled in AMP in the pre-period but were no longer active in the post-period reduced their arrears as a result. Customers who were active in AMP in both the pre-period and post-period reduced their arrears by an average of \$251. This reduction was similar to that of customers who were not active in AMP in either period, who saw an average reduction of \$231. Customers who became active in AMP in the post-period after not being active in the pre-period saw a slight increase in arrears, by an average of \$41. This does not support the hypothesis that joining AMP in the post-period helped to decrease customer arrears.

TABLE 6-13: PG&E ARREARS SUMMARY BY AMP AND CBO PILOT STATUS

CBO Participant Status	Active AMP Pre	Active AMP Post	Count	Mean Arrears Pre	Mean Arrears Post	Mean Months Active AMP Pre	Mean Months Active AMP Post
Matched Non-Participant	No	No	775	\$1,421	\$1,141	0.0	0.0
		Yes	422	\$1,817	\$1,877	0.0	6.5
	Yes	No	274	\$1,812	\$832	4.4	0.0
		Yes	391	\$1,693	\$1,374	3.3	5.9
Participant	No	No	591	\$1,403	\$1,206	0.0	0.0
		Yes	600	\$1,742	\$1,764	0.0	6.4
	Yes	No	304	\$1,729	\$833	4.6	0.0
		Yes	367	\$1,704	\$1,521	3.6	5.6

Table 6-14 provides the average arrears for SCE customers by AMP enrollment status and CBO Pilot participation. Overall, SCE customers who participated in the CBO Pilot experienced a decrease in arrears on average between the pre- and post-periods across all AMP enrollment groups. In contrast, every matched non-participant group experienced an increase in arrears on average over the same period.

Among customers who were enrolled in AMP during both the pre- and post-periods, CBO Pilot participants saw their average arrears decrease slightly by \$79, from \$3,078 to \$2,999 (n=9). In comparison, matched non-participants who remained enrolled in AMP throughout both periods experienced an average increase of \$418, from \$1,650 to \$2,068 (n=13). These groups are relatively small, so the results should be interpreted with caution.

TABLE 6-14: SCE ARREARS SUMMARY BY AMP AND CBO PILOT STATUS

CBO Participant Status	Active AMP Pre	Active AMP Post	Count	Mean Arrears Pre	Mean Arrears Post	Mean Months Active AMP Pre	Mean Months Active AMP Post
Matched Non-Participant	No	No	171	\$1,441	\$1,509	0.0	0.0
		Yes	36	\$1,678	\$1,733	0.0	6.1
	Yes	No	18	\$2,708	\$3,141	4.8	0.0
		Yes	13	\$1,650	\$2,068	4.5	6.2
Participant	No	No	149	\$1,492	\$1,211	0.0	0.0
		Yes	57	\$1,728	\$1,642	0.0	5.6
	Yes	No	23	\$1,545	\$1,158	7.4	0.0
		Yes	9	\$3,078	\$2,999	7.1	4.2

Table 6-15 summarizes arrears by AMP participation status before and after CBO enrollment for SDG&E customers. Customers who enrolled in AMP in the post-period generally experienced increases in arrears, while customers who were not enrolled in AMP or exited the program experienced decreases. Customers who were enrolled in AMP in both the pre- and post-period generally experienced a decrease in arrears.

The percentage of participants and non-participants enrolled in AMP increased following enrollment in the pilot.

TABLE 6-15: SDG&E ARREARS SUMMARY BY AMP AND CBO PILOT STATUS

CBO Participant Status	Active AMP Pre	Active AMP Post	Count	Mean Arrears Pre	Mean Arrears Post	Mean Months Active AMP Pre	Mean Months Active AMP Post
Matched Non-Participant	No	No	339	\$1,164	\$959	0.0	0.0
		Yes	103	\$1,614	\$1,683	0.0	4.5
	Yes	No	65	\$1,233	\$1,021	7.5	0.0
		Yes	99	\$1,605	\$1,018	5.4	4.7
Participant	No	No	310	\$1,033	\$873	0.0	0.0
		Yes	143	\$1,780	\$1,822	0.0	4.1
	Yes	No	63	\$1,239	\$981	7.4	0.0
		Yes	90	\$1,619	\$1,261	5.4	3.9

Table 6-16 shows the summary of arrears by AMP and pilot participation status for SoCalGas. SoCalGas is the only utility who had fewer customers enrolled in AMP in the post-period compared to the pre-period. For customers who were active in AMP in the pre-period but not in the post-period, arrearages increased by an average of \$337 for non-participants and \$347 for participants. For every other customer segment, average arrearages decreased from the pre- to post-period. The largest arrears reductions were for the customers who were not on AMP in the pre-period but then became enrolled in AMP in the post-period, with an average reduction of \$523 for non-participants and \$504 for participants.

TABLE 6-16: SOCALGAS ARREARS SUMMARY BY AMP AND CBO PILOT STATUS

CBO Participant Status	Active AMP Pre	Active AMP Post	Count	Mean Arrears Pre	Mean Arrears Post	Mean Months Active AMP Pre	Mean Months Active AMP Post
Matched Non-Participant	No	No	132	\$900	\$736	0.0	0.0
		Yes	16	\$751	\$228	0.0	7.8
	Yes	No	61	\$995	\$1,332	3.9	0.0
		Yes	54	\$978	\$482	2.9	7.0
Participant	No	No	86	\$843	\$763	0.0	0.0
		Yes	42	\$1,085	\$581	0.0	6.9
	Yes	No	67	\$1,024	\$1,371	3.8	0.0
		Yes	68	\$831	\$500	3.0	6.6

Pilot Impacts on AMP Enrollment

Similar to the CARE impacts section, the evaluation team used a logit model to predict enrollment in AMP in the post-period as a function of CBO Pilot participation and pre-period AMP enrollment status. Table 6-17 through Table 6-20 show the predicted likelihood of enrolling in AMP following participation in the CBO Pilot, holding pre-period AMP enrollment status constant.

Table 6-17 shows the logit model findings for the probability of customer segments being enrolled in AMP in the post-period, given different AMP enrollment statuses in the pre-period, for PG&E participants and non-participants. Participants who were not enrolled in AMP in the pre-period had an estimated 39.7% probability of enrolling in AMP in the post-period, compared to an estimated 30.1% probability for non-participants who were not enrolled in AMP in the pre-period. The impact coefficient, standard error, and p -value are shown below the table and indicate a statistically significant positive effect of CBO Pilot participation on the probability of AMP enrollment in the post-period, holding pre-period AMP status constant. The average marginal effect of 0.0879 indicates that, on average, participation in the CBO Pilot is associated with an 8.8 percentage point increase in the probability of being enrolled in AMP in the post-period.

TABLE 6-17: PG&E LOGIT MODEL FINDINGS FOR AMP ENROLLMENT POST CBO PILOT

CBO Participant Status	Active AMP Pre	Count	AMP Predicted Enrollment Probability
Matched Non-Participant	No	1,197	30.1%
	Yes	665	18.8%
Participant	No	1,191	39.7%
	Yes	671	26.2%
Impact Coefficient: 0.4247, Std. Error: 0.072, p -value: 0.0000			
Average Marginal Effect: 0.0879			

Table 6-18 provides SCE's logit model findings for the predicted probability of CBO participants and non-participants enrolling in AMP in the post-period, by pre-period AMP enrollment status. SCE's participants who were not enrolled in AMP prior to the pilot had a higher predicted probability of enrolling in AMP after enrollment in the pilot than non-participants, with a probability of 24.5% for participants and 14.3% for non-participants. This is also true for customers who were enrolled in AMP in the pre-period, with these participants having a 42.3% predicted probability of enrolling in the post-period compared to 27.3% for non-participants. The model predicts that enrolling in the CBO Pilot gives a statistically significant positive impact on enrollment in AMP in the post-period for SCE customers ($p=0.0039$). On average, participation in the CBO pilot creates a 10.9 percentage point increase in the probability of being enrolled in AMP in the post-period.

TABLE 6-18: SCE LOGIT MODEL FINDINGS FOR AMP ENROLLMENT POST CBO PILOT

CBO Participant Status	Active AMP Pre	Count	AMP Predicted Enrollment Probability
Matched Non-Participant	No	207	14.3%
	Yes	31	27.3%
Participants	No	206	24.5%
	Yes	32	42.3%
Impact Coefficient: 0.6678, Std. Error: 0.232, <i>p</i> -value: 0.0039			
Average Marginal Effect: 0.1086			

Table 6-19 presents SDG&E's logit model findings on the predicted probability post-period AMP enrollment by CBO Pilot participation status and pre-period AMP enrollment status. Among customers who were not enrolled in AMP during the pre-period, CBO participants had an estimated 26.5% probability of enrolling in AMP in the post-period, compared to 20.5% for non-participants. Among customers who were enrolled in AMP during the pre-period, participants also had a higher predicted probability of being enrolled in the post-period than non-participants, at 10.0% compared to 7.4%. The model estimates that participation in the CBO Pilot increased the probability of post-period AMP enrollment by 5.7 percentage points on average. This effect was statistically significant ($p = 0.0168$), suggesting that CBO Pilot participants were more likely than comparable non-participants to be enrolled in AMP after CBO Pilot enrollment.

TABLE 6-19: SDG&E LOGIT MODEL FINDINGS FOR AMP ENROLLMENT POST CBO PILOT

CBO Participant Status	Active AMP Pre	Count	AMP Predicted Enrollment Probability
Matched Non-Participant	No	442	21.5%
	Yes	164	11.6%
Participants	No	453	27.8%
	Yes	153	15.6%
Impact Coefficient: 0.3434, Std. Error: 0.141, <i>p</i> -value: 0.0150			
Average Marginal Effect: 0.0574			

Table 6-20 presents the logit model findings for SoCalGas customers on predicted probability of enrollment in AMP in the post-period by AMP status in the pre-period and pilot enrollment. Among customers who were not initially active in AMP, the predicted probability enrolling in AMP in the post-period is 7.8% for non-participants and 12.8% for participants. Among customers who were active in AMP in the pre-period, the predicted probability is also higher for participants, at 30.8% compared to 20.4% for non-participants. The model shows a statistically significant impact of the pilot on AMP enrollment, amounting to a 7.6 percentage point increase in likelihood of enrollment due to the pilot. It's important to note, however, that AMP enrollment fell for both participants and non-participants at SoCalGas, so this increased likelihood reflects a comparison to the non-participant post-period group rather than to pre-period enrollment values.

TABLE 6-20: SOCALGAS LOGIT MODEL FINDINGS FOR AMP ENROLLMENT POST CBO PILOT

CBO Participant Status	Active AMP Pre	Count	AMP Predicted Enrollment Probability
Matched Non-Participant	No	148	7.8%
	Yes	115	20.4%
Participants	No	128	12.8%
	Yes	135	30.8%
Impact Coefficient: 0.5528, Std. Error: 0.240, <i>p</i> -value: 0.0210			
Average Marginal Effect: 0.0759			

6.3.3 LIHEAP Enrollment

This section summarizes the enrollment in LIHEAP for pilot participants and their matched controls. Eligible utility customers facing high utility bill burden can turn to the Federal LIHEAP program for assistance paying their home heating and cooling costs. We provide the following analyses and information to assess the relationship between LIHEAP enrollment and arrearage reduction for participants and their matched controls.

LIHEAP enrollment varied by IOU and CBO during the pre- and post-enrollment periods:

- PG&E:
 - 10% of participants were enrolled in LIHEAP in pre → 15% enrolled post-period
 - 6% of non-participants were enrolled in LIHEAP in pre → 6% enrolled post-period
- SCE CAPSBC:
 - 33% of participants were enrolled in LIHEAP in pre → 82% enrolled post-period
 - 8% of non-participants were enrolled in LIHEAP in pre → 3% enrolled post-period
- SCE UWTC:
 - 9% of participants were enrolled in LIHEAP in pre → 9% enrolled post-period
 - 6% of non-participants were enrolled in LIHEAP in pre → 3% enrolled post-period
- SDG&E:
 - 79% of participants were enrolled in LIHEAP in pre → 90% enrolled post-period
 - 76% of non-participants were enrolled in LIHEAP in pre → 86% enrolled post-period
- SoCalGas:
 - 4% of participants were enrolled in LIHEAP in pre → 2% enrolled post-period
 - 1% of non-participants were enrolled in LIHEAP in pre → 3% enrolled post-period

The share of participants enrolled in LIHEAP differed substantially across utilities, ranging from a high of 90% for SDG&E in the post-pilot period to a low of 1% for SoCalGas non-participants during the pre-pilot period. PG&E's, SCE's CAPSBC, and SDG&E's pilot participants increased their participation in LIHEAP during the post-CBO Pilot period. As Figure 6-4 illustrates, however, SCE's CAPSBC CBO participants have close to a 50 percentage point increase in their LIHEAP enrollment between the pre- and post-pilot period, indicating a strong effect of the CBO Pilot as implemented by CAPSBC on LIHEAP participation.

FIGURE 6-4: PERCENTAGE-POINT CHANGE IN LIHEAP ENROLLMENT BY UTILITY FOR CBO PARTICIPANTS AND NON-PARTICIPANTS

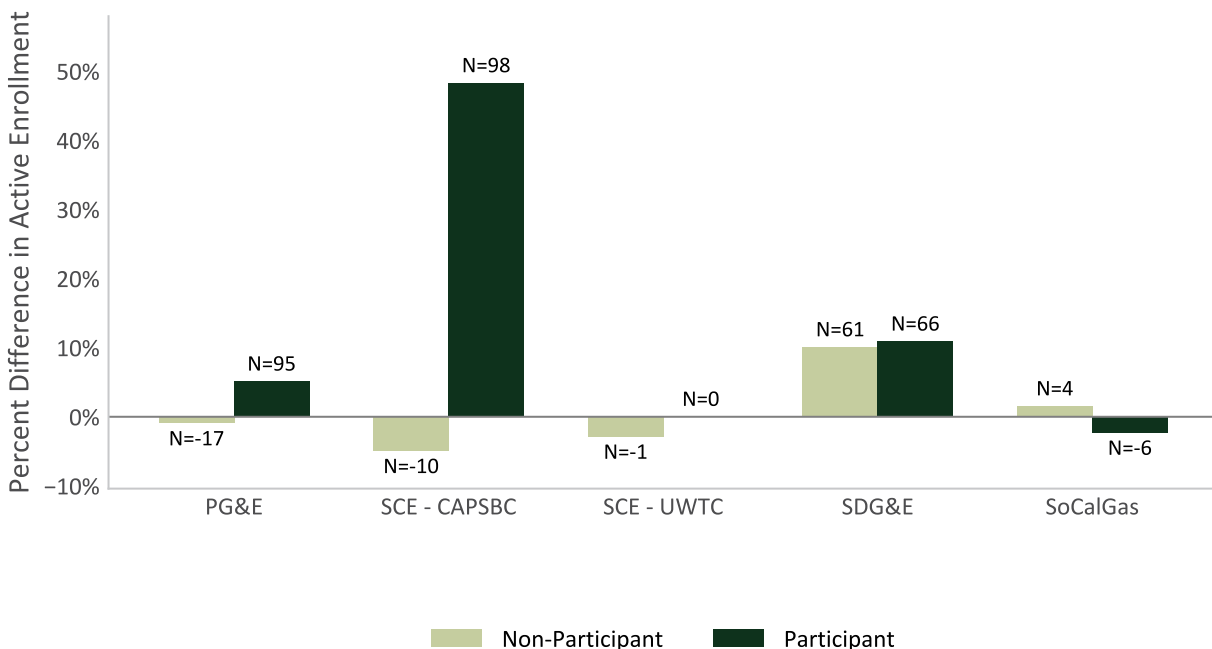


Table 6-21 through Table 6-24 provide additional information on LIHEAP participation and average payment by CBO Pilot participation status.

Table 6-21 provides a summary of the counts and average LIHEAP payments for PG&E's CBO Pilot participants and non-participants. The pilot appears to have increased LIHEAP participation relative to the pre-period and to matched non-participants.

TABLE 6-21: PG&E LIHEAP SUMMARY BY CBO PILOT STATUS

CBO Participant Status	LIHEAP Pre	LIHEAP Post	Count	Mean LIHEAP Payment Pre	Mean LIHEAP Payment Post
Matched Non-Participant	No	No	1,648	-	-
		Yes	94	-	\$1,201
	Yes	No	111	\$1,096	-
		Yes	9	\$1,334	\$1,289
Participant	No	No	1,419	-	-
		Yes	255	-	\$1,227
	Yes	No	160	\$1,120	-
		Yes	28	\$990	\$1,095

The summary of the counts and average LIHEAP payments for SCE’s CAPSBC and UWTC participants and non-participants is presented in Table 6-22 below. SCE’s CBO Pilot LIHEAP findings have been split by CBO due to the substantial difference in the CBOs’ ability to encourage LIHEAP enrollment, as illustrated in Figure 6-4. Approximately 33% of CAPSBC’s participants and 8% of their non-participants participated in LIHEAP in the CBO Pilot’s pre-enrollment period. During the post-pilot enrollment period, CAPSBC’s participant share receiving LIHEAP increased by over 50 percentage points.

TABLE 6-22: SCE LIHEAP SUMMARY BY CBO PILOT STATUS

CBO	CBO Participant Status	LIHEAP Pre	LIHEAP Post	Count	Mean LIHEAP Payment Pre	Mean LIHEAP Payment Post
CAPSBC	Matched Non-Participant	No	No	183	-	-
			Yes	3	-	\$1,479
		Yes	No	13	\$1,163	-
			Yes	4	\$2,376	\$901
	Participant	No	No	28	-	-
			Yes	107	-	\$1,314
		Yes	No	9	\$728	-
			Yes	59	\$807	\$1,109
UWTC	Matched Non-Participant	No	No	32	-	-
			Yes	1	-	\$1,293
		Yes	No	2	\$754	-
	Participant	No	No	30	-	-
			Yes	2	-	\$1,036
		Yes	No	2	\$1,071	-
			Yes	1	\$729	\$694

Table 6-23 provides a summary of the counts and average LIHEAP payments for SDG&E’s CBO Pilot. A substantial share of SDG&E’s CBO Pilot participants (79% to 89%) and non-participants (76% to 86%) received a LIHEAP payment in the pre- and the post-pilot period. While SDG&E’s share of CBO participants

receiving LIHEAP payments exceeds that of the three other IOUs, the increase in the share of CBO participants receiving LIHEAP is only ten percentage points and the CBO non-participant share receiving LIHEAP also increased by ten percentage points. The similar increase in LIHEAP participation from CBO participants and non-participants implies that the CBO Pilot did not cause the CBO participants to increase their participation relative to others.

TABLE 6-23: SDG&E LIHEAP SUMMARY BY CBO PILOT STATUS

CBO Participant Status	LIHEAP Pre	LIHEAP Post	Count	Mean LIHEAP Payment Pre	Mean LIHEAP Payment Post
Matched Non-Participant	No	No	53	-	-
		Yes	91	-	\$1,220
	Yes	No	30	\$458	-
		Yes	432	\$617	\$1,217
Participant	No	No	36	-	-
		Yes	91	-	\$1,011
	Yes	No	25	\$676	-
		Yes	454	\$573	\$1,127

Table 6-24 provides a summary of the counts and average LIHEAP payments for SoCalGas's CBO Pilot participants and non-participants. Very few of SoCalGas' pilot participants or non-participants received LIHEAP payments.

TABLE 6-24: SOCALGAS LIHEAP SUMMARY BY CBO PILOT STATUS

CBO Participant Status	LIHEAP Pre	LIHEAP Post	Count	Mean LIHEAP Payment Pre	Mean LIHEAP Payment Post
Matched Non-Participant	No	No	254	-	-
		Yes	6	-	\$1,084
	Yes	No	2	\$1,418	-
		Yes	1	\$496	\$1,190
Participant	No	No	247	-	-
		Yes	5	-	\$995
	Yes	No	11	\$680	-

CBO Pilot Impacts on LIHEAP Enrollment

The evaluation team used a logit model to predict enrollment in the LIHEAP program in the post-period as a function of CBO Pilot participation and LIHEAP program pre-period activity. This analysis approach controls for customers that had been active in LIHEAP in the pre-CBO period, as enrollment in LIHEAP prior to the CBO Pilot indicates that the customer is aware of LIHEAP and may be more likely to access LIHEAP in the post-period. The model's coefficient on the binary variable for CBO participation in the post-period

is the parameter estimate of the pilot's impact on LIHEAP participation. Table 6-25 through Table 6-28 present findings for the impact of the CBO Pilot on the likelihood of enrolling in the Federal LIHEAP program using the logit model results.

The estimated impact of PG&E's CBO Pilot on LIHEAP enrollment is presented in Table 6-25. The logit model results support the conclusion that PG&E's CBO Pilot increased the likelihood of LIHEAP enrollment by pilot participants to 15% while the next highest likelihood of participation was almost ten percentage points less. The logit model's impact coefficient was statistically significant with a p -value of 0.0 and the estimated marginal effect of the pilot was 0.09.

TABLE 6-25: PG&E LOGIT MODEL FINDINGS FOR LIHEAP ENROLLMENT POST CBO PILOT

CBO Participant Status	Received LIHEAP in Pre	Count	Predicted LIHEAP Probability
Matched Non-Participant	No	1,742	5.4%
	Yes	120	0.0%
Participant	No	1,674	15.2%
	Yes	188	0.0%
Impact Coefficient: 1.1476, Std. Error: 0.126, p -value: 0.0000			
Average Marginal Effect: 0.0902			

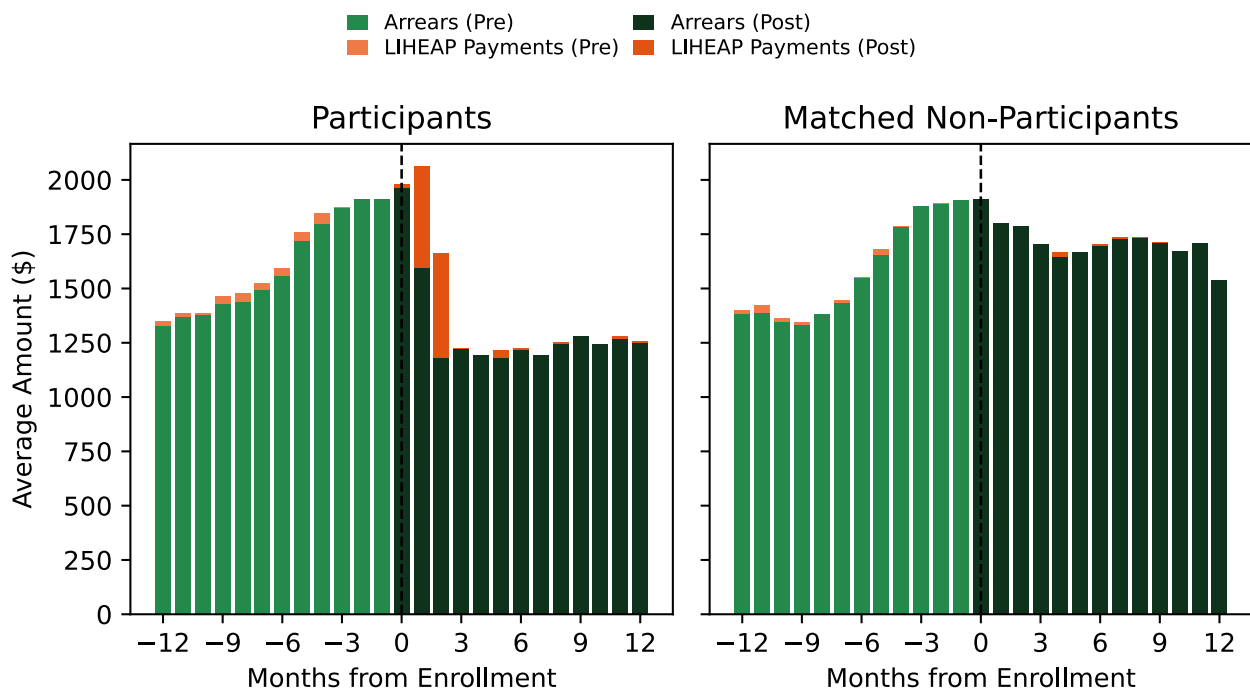
The estimated impact of SCE's CBO Pilot on LIHEAP enrollment is presented in Table 6-26. The logit model results support the conclusion that SCE's CBO Pilot significantly and substantially increased the likelihood of LIHEAP enrollment by pilot participants (to 65% across the two SCE CBOs, CAPSBC and UWTC). The next highest likelihood of participation was over 60 percentage points less for non-participants who had not participated in LIHEAP in the pre-period. The logit model's impact coefficient was statistically significant with a coefficient of 4.6 and a p -value of 0.0. The estimated average marginal effect of the pilot was 0.51. The estimated impact of SCE's CBO Pilot on LIHEAP enrollment is supportive of the conclusion that the pilot substantially and statistically significantly increased LIHEAP enrollment and this increase in LIHEAP participation decreased pilot customer arrears.

TABLE 6-26: SCE LOGIT MODEL FINDINGS FOR LIHEAP ENROLLMENT POST CBO PILOT

CBO Participant Status	Received LIHEAP in Pre	Count	Predicted LIHEAP Probability
Matched Non-Participant	No	219	1.8%
	Yes	19	0.0%
Participant	No	167	65.3%
	Yes	71	0.0%
Impact Coefficient: 4.6152, Std. Error: 0.530, p -value: 0.0000			
Average Marginal Effect: 0.5145			

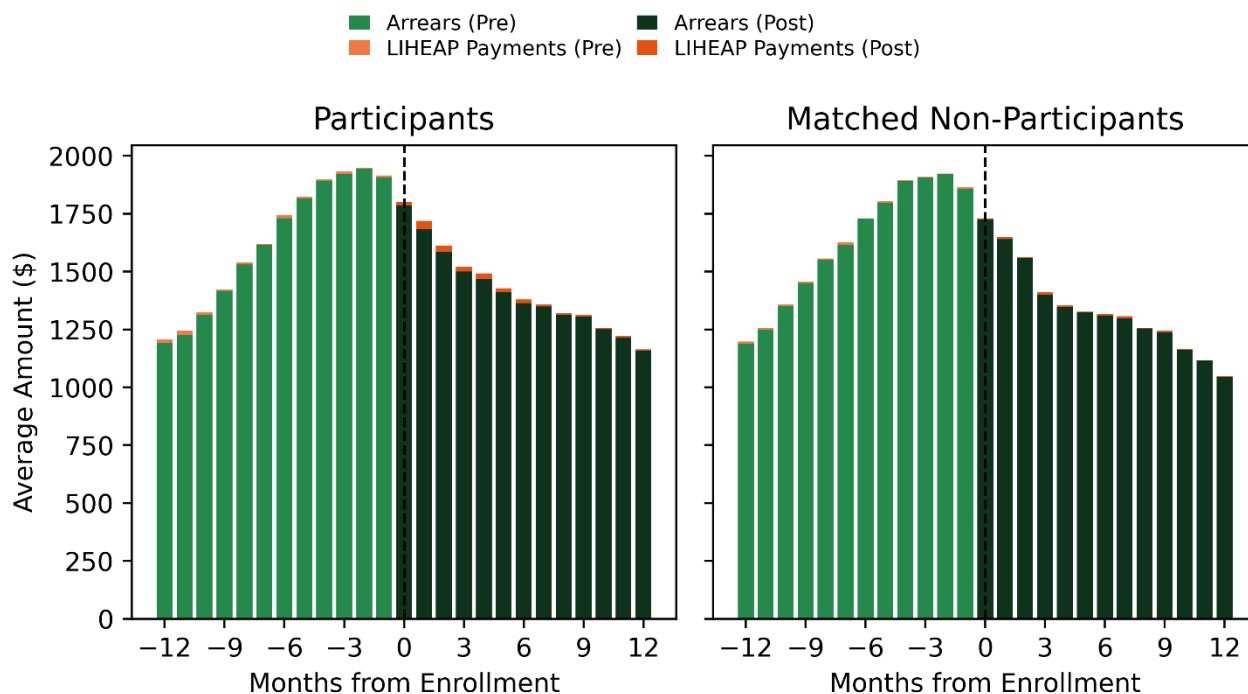
The LIHEAP enrollment results for SCE merit additional discussion because SCE was the only IOU to show a significant decrease in arrears. As shown above (Table 6-26), LIHEAP payments can be substantial, so this increase in enrollment is likely the driving factor behind SCE’s arrearage impacts. This effect is clearly illustrated in Figure 6-5, which shows the average arrears and LIHEAP payments for pilot participants and their matched controls associated with CAPSBC by the months from enrollment. As the left side of the figure shows, average LIHEAP payments in the first two months after the enrollment month are clearly aligned with the marked drops in average arrears. In contrast, the matched non-participants have barely discernible LIHEAP payments in both before and after the enrollment period.

FIGURE 6-5: AVERAGE ARREARS AND LIHEAP PAYMENTS FOR SCE (CAPSBC) BY MONTHS FROM ENROLLMENT



It is helpful to contrast CAPSBC plot with the same figure for PG&E, which is shown for its lone CBO CAPK in Figure 6-6. Similar to CAPSBC, the process evaluation found that LIHEAP was also identified as an important tool for combatting debt for CAPK (though referring participants was not the primary approach). This effect is visible, with a small but clear increase in LIHEAP payments for the participants in the post-period, particularly when contrasted with the matched non-participants. However, the effect is a small fraction of what one sees with CAPSBC, so even though PG&E’s logit model also showed a significant effect in increasing LIHEAP participation, the numbers were not enough for the decline in arrears to be significant in the 2SDiD modeling.

FIGURE 6-6: AVERAGE ARREARS AND LIHEAP PAYMENTS FOR PG&E (CAPK) BY MONTHS FROM ENROLLMENT



The estimated impact of SDG&E’s CBO Pilot on LIHEAP enrollment is presented in Table 6-27. The logit model results imply that SDG&E’s CBO Pilot did not significantly impact the likelihood of LIHEAP enrollment by pilot participants. The logit model’s impact coefficient of 0.38 was not statistically significantly different from zero (p -value of 0.139) and the estimated marginal effect of the pilot was 0.02. These results support the conclusion that SDG&E’s CBO Pilot did not increase participants’ likelihood of participation in LIHEAP.

TABLE 6-27: SDG&E LOGIT MODEL FINDINGS FOR LIHEAP ENROLLMENT POST CBO PILOT

CBO Participant Status	Received LIHEAP in Pre	Count	Predicted LIHEAP Probability
Matched Non-Participant	No	144	63.2%
	Yes	462	0.0%
Participant	No	127	71.7%
	Yes	479	0.0%
Impact Coefficient: 0.3868, Std. Error: 0.262, <i>p</i> -value: 0.1398			
Average Marginal Effect: 0.0189			

The estimated impact of SoCalGas’s CBO Pilot on LIHEAP enrollment is presented in Table 6-28. The logit model results imply that SoCalGas’s CBO Pilot did not significantly impact the likelihood of LIHEAP enrollment by pilot participants. The logit model’s impact coefficients imply that the predicted probability of LIHEAP participation is approximately 2% for both CBO participants and their matched non-participants. The impact coefficient for the logit model is -0.15, implying the model estimated that the CBO Pilot decreased the likelihood of participation (though the estimate is statistically insignificant *p*-value of 0.8). These results support the conclusion that SoCalGas’s CBO Pilot did not increase participants’ likelihood of participation in LIHEAP.

TABLE 6-28: SOCALGAS LOGIT MODEL FINDINGS FOR LIHEAP ENROLLMENT POST CBO PILOT

CBO Participant Status	Received LIHEAP in Pre	Count	Predicted LIHEAP Probability
Matched Non-Participant	No	260	2.3%
	Yes	3	0.0%
Participant	No	252	2.0%
	Yes	11	0.0%
Impact Coefficient: -0.1544, Std. Error: 0.612, <i>p</i> -value: 0.8009			
Average Marginal Effect: -0.0031			

6.3.4 ESA Enrollment

This section summarizes the enrollment in ESA for pilot participants and their matched controls. The ESA program provides no-cost weatherization services, energy-efficient appliances, and home repairs to income-qualified renters and homeowners to help them lower their utility bills and improve home comfort. Like LIHEAP, ESA generally has a single date of participation, rather than an ongoing enrollment period. Unlike LIHEAP, ESA is a program that is unlikely to have repeated involvement, with most participants taking part in single projects.

ESA enrollment varied by IOU during the pre- and post-enrollment periods as follows:

- PG&E:
 - 14% of participants were enrolled in ESA in pre → 15% enrolled post-period

- 11% of non-participants were enrolled in ESA in pre → 10% enrolled post-period
- SCE:
 - 1% of participants were enrolled in ESA in pre → 7% enrolled post-period
 - 4% of non-participants were enrolled in ESA in pre → 6% enrolled post-period
- SDG&E:
 - 0.5% of participants were enrolled in ESA in pre → 2% enrolled post-period
 - 1% of non-participants were enrolled in ESA in pre → 2% enrolled post-period
- SoCalGas:
 - 3% of participants were enrolled in ESA in pre → 2.3% enrolled post-period
 - 2.3% of non-participants were enrolled in ESA in pre → 1.9% enrolled post-period

As shown in Table 6-29, for PG&E the CBO Pilot participants and the control group had only small shifts in their ESA participation. For example, the share of pilot participants that enrolled in ESA increased from 14% in the pre-period to just over 15% in the post. These small changes in ESA enrollment suggest that PG&E’s CBO was not successful in using the ESA program to help participants reduce their arrears.

TABLE 6-29: PG&E ESA SUMMARY BY CBO PILOT STATUS

CBO Participant Status	ESA Pre	ESA Post	Count
Matched Non-Participant	No	No	1,489
		Yes	161
	Yes	No	186
		Yes	26
Participant	No	No	1,358
		Yes	244
	Yes	No	223
		Yes	37

For SCE, Table 6-30 shows that both CBO Pilot participants and non-participants increased their participation in ESA. While the control group segments show a modest increase from 10 homes in the pre-period to 14 (13 new enrollments and one repeat) in the post, the pilot participants increased from three enrollments in the pre-period to 16 new enrollments in the post-period. ESA participation, however, is modest in both the pre- and post-periods.

TABLE 6-30: SCE ESA SUMMARY BY CBO PILOT STATUS

CBO Participant Status	ESA Pre	ESA Post	Count
Matched Non-Participant	No	No	215
		Yes	13
	Yes	No	9
		Yes	1
Participant	No	No	219
		Yes	16
	Yes	No	3
		Yes	0

Table 6-31 presents SDG&E's enrollment in ESA by CBO Pilot status. SDG&E's CBO participants and matched non-participants exhibited the lowest participation in ESA, relative to the other IOUs, in either the pre- or post-enrollment periods.

TABLE 6-31: SDG&E ESA SUMMARY BY CBO PILOT STATUS

CBO Participant Status	ESA Pre	ESA Post	Count
Matched Non-Participant	No	No	591
		Yes	10
	Yes	No	5
		Yes	0
Participant	No	No	589
		Yes	14
	Yes	No	3
		Yes	0

ESA participation for SoCalGas is presented in Table 6-32. Similar to SDG&E, SoCalGas also had very few ESA enrollments in the pre- and post-period.

TABLE 6-32: SOCALGAS ESA SUMMARY BY CBO PILOT STATUS

CBO Participant Status	ESA Pre	ESA Post	Count
Matched Non-Participant	No	No	252
		Yes	5
	Yes	No	6
		Yes	0
Participant	No	No	249
		Yes	6
	Yes	No	8
		Yes	0

CBO Pilot Impacts on ESA Enrollment

Verdant modeled the CBO Pilot impacts on ESA enrollment using the same logit model approach used for the assessment of other programs, in this case predicting the likelihood of participation ESA in the post-period as a function of pilot participation and previous ESA activity.

As shown in row 5 of Table 6-33, despite the modest increase in CBO Pilot participants active in ESA in the post-period, the statistical model found the effect to be statistically significant. Consistent with the summary previously discussed, the effect is small, with the coefficient translating into an AME of just under five percentage points (0.0478). The statistical significance is due in large part to the high number of pilot participants for PG&E, but it does stand to reason that funneling pilot participants into programs such as ESA should be an achievable objective and help participants reduce their relatively high energy consumption.

TABLE 6-33: PG&E LOGIT MODEL FINDINGS FOR ESA ENROLLMENT POST CBO PILOT

CBO Participant Status	Participated in ESA in Pre	Count	Predicted ESA Participation Probability
Matched Non-Participant	No	1,650	9.8%
	Yes	212	0.0%
Participant	No	1,602	15.2%
	Yes	260	0.0%

Impact Coefficient: 0.5079, Std. Error: 0.108, *p*-value: 0.0000

Average Marginal Effect: 0.0478

In contrast to PG&E, SCE, SDG&E and SoCalGas did not show significant CBO Pilot impacts with respect to ESA participation. As seen in Table 6-34, Table 6-35, and Table 6-36, while the impact coefficients were positive, none of the results were statistically significant, and they translated into very small average marginal effects. For the three utilities, the comparison of the predicted ESA participation for pilot participants and the control homes are very similar (e.g., 6.8% for pilot participants compared to 5.7% for

the control for SCE). This smaller number of CBO Pilot participants is partially responsible for this result, but also the smaller shares that were associated with ESA.

TABLE 6-34: SCE LOGIT MODEL FINDINGS FOR ESA ENROLLMENT POST CBO PILOT

CBO Participant Status	Participated in ESA in Pre	Count	Predicted ESA Participation Probability
Matched Non-Participant	No	228	5.7%
	Yes	10	0.0%
Participant	No	235	6.8%
	Yes	3	0.0%
Impact Coefficient: 0.1892, Std. Error: 0.386, <i>p</i> -value: 0.6236			
Average Marginal Effect: 0.0108			

TABLE 6-35: SDG&E LOGIT MODEL FINDINGS FOR ESA ENROLLMENT POST CBO PILOT

CBO Participant Status	Participated in ESA in Pre	Count	Predicted ESA Participation Probability
Matched Non-Participant	No	601	1.7%
	Yes	5	0.0%
Participant	No	603	2.3%
	Yes	3	0.0%
Impact Coefficient: 0.3399, Std. Error: 0.418, <i>p</i> -value: 0.4163			
Average Marginal Effect: 0.0065			

TABLE 6-36: SOCALGAS LOGIT MODEL FINDINGS FOR ESA ENROLLMENT POST CBO PILOT

CBO Participant Status	Participated in ESA in Pre	Count	Predicted ESA Participation Probability
Matched Non-Participant	No	257	1.9%
	Yes	6	0.0%
Participant	No	255	2.4%
	Yes	8	0.0%
Impact Coefficient: 0.1943, Std. Error: 0.612, <i>p</i> -value: 0.7509			
Average Marginal Effect: 0.0040			

6.3.5 Utility-Specific Program Enrollment

This section further explores how the CBO pilot impacted enrollment in utility-specific budgeting and assistance programs.

PG&E Match My Payment

Match My Payment (MMP) is a PG&E-specific debt-relief program in which participants can receive up to \$1,000 in matching payments toward past-due bills. To qualify, customers must have a past-due balance of at least \$100, a household income not exceeding 400% of the federal poverty level, and make a payment of \$50 to \$1,000 toward their arrears, which PG&E matches upon enrollment.

MMP began in June 2025, so all CBO pilot participants and matched non-participants who enrolled in the program did so during the pilot post-period. Therefore, findings are presented as a contingency table showing observed and expected counts of participants and non-participants who received MMP relief in the post-period, since we are not able to estimate a logit model based on changes in pre- and post-period enrollment.

Comparing post-period MMP enrollment between participants and matched non-participants shows a small but statistically significant difference between the two groups. Participants enrolled in MMP at a higher rate (7.9%) than matched non-participants (2.9%), against an expected rate of roughly 5.4% for both groups absent any pilot effect. This shows participants received MMP at a modestly higher rate, but without any pre-enrollment data to serve as a baseline, we cannot say that is due to the pilot. The higher share could simply be associated with other attributes that led participants to be recruited or willing to enroll. The contingency table is shown in Table 6-37 below:

TABLE 6-37: PG&E CBO PILOT PARTICIPATION BY PARTICIPATION IN MMP IN POST CONTINGENCY TABLE

CBO Participant Status	MMP in Post-Period ¹	
	No MMP	MMP
Matched Non-Participant	Observed: 1,808 (97.1%) Expected: 1,762 (96.4%)	Observed: 54 (2.9%) Expected: 100 (5.4%)
Participant	Observed: 1,715 (92.1%) Expected: 1,762 (94.6%)	Observed: 147 (7.9%) Expected: 100 (5.4%)

¹ $\chi^2 = 44.512$, $p = 0.0000$, $\text{dof} = 1$, Cramér's $V = 0.1093$

PG&E Relief for Energy Assistance through Community Help

PG&E's Relief for Energy Assistance through Community Assistance Help (REACH) program provides financial assistance to low-income customers by granting them up to \$800 towards the past due portion of their bill. To be eligible for REACH, one must have received either a 15-day or 48-hour disconnection notice, household income not exceeding 200% of the federal poverty level, and not received REACH assistance within the same calendar year.

The program effects on REACH enrollment were estimated using the logit model approach and indicate a small but statistically significant difference in predicted REACH enrollment probability between participants and non-participants. Among customers with no prior REACH grant, participants had a predicted enrollment probability of 8.2% versus 4.1% for non-participants. Among customers who did receive REACH in the pre-period, participants had a predicted probability of 13.4% versus 7.0% for non-participants. The average marginal effect of participation was a 4.3 percentage point increase in predicted enrollment probability. The logit results are shown in Table 6-38 below.

TABLE 6-38: PG&E LOGIT MODEL FINDINGS FOR REACH ENROLLMENT POST CBO PILOT

CBO Participant Status	Received REACH in Pre	Count	Predicted REACH Probability
Matched Non-Participant	No	1,760	4.1%
	Yes	102	7.0%
Participant	No	1,646	8.2%
	Yes	216	13.4%
Impact Coefficient: 0.7270, Std. Error: 0.142, <i>p</i> -value: 0.0000			
Average Marginal Effect: 0.0427			

SDG&E Neighbor-To-Neighbor

The SDG&E Neighbor-To-Neighbor (NTN) program provides up to \$300 in one-time grants to help offset energy arrearages for SDG&E customers who are not eligible for LIHEAP. In addition to LIHEAP ineligibility, to qualify for the program, customers must certify they are experiencing serious illness, temporary unemployment, disability, or unusual hardship.

Based on the logit model, there was a small, but statistically significant difference in the predicted probability of NTN enrollment between participants and non-participants, as shown below in Table 6-39. Participants who did not receive NTN in the pre-period had a 4.0% predicted probability of enrollment compared to 1.7% for non-participants. This corresponds to a 2.4 percentage point increase in the predicted probability of enrolling in NTN as a participant in the CBO Pilot compared to a non-participant. The small magnitude of the pilot's impact on NTN enrollment was likely due in part to the program's narrow eligibility requirements and correspondingly low enrollment counts.

TABLE 6-39: SDG&E LOGIT MODEL FINDINGS FOR NTN ENROLLMENT POST CBO PILOT

CBO Participant Status	Received NTN in Pre	Count	Predicted NTN Probability
Matched Non-Participant	No	604	1.7%
	Yes	2	0.0%
Participant	No	594	4.0%
	Yes	12	0.0%
Impact Coefficient: 0.9167, Std. Error: 0.381, <i>p</i> -value: 0.0161			
Average Marginal Effect: 0.0236			

SoCalGas Gas Assistance Fund

The SoCalGas Gas Assistance Fund (GAF) provides a one-time grant for customer gas bills up to \$100. To be eligible for GAF, customers must not apply for more than one GAF allowance per program year and meet GAF's household income requirements.

The logit model results for GAF are shown in Table 6-40 below. There is a small but statistically significant difference in the predicted enrollment in GAF between participants and non-participants. For those who

were not enrolled in GAF in the pre-period, there was a 0.4% predicted enrollment in the post-period for non-participants compared to 3.6% for participants. This corresponds to a 3.3 percentage point increase in the predicted likelihood of enrolling in GAF due to the pilot.

TABLE 6-40: SOCALGAS LOGIT MODEL FINDINGS FOR GAF ENROLLMENT POST CBO PILOT

CBO Participant Status	Received GAF in Pre	Count	Predicted GAF Probability
Matched Non-Participant	No	258	0.4%
	Yes	5	0.0%
Participant	No	250	3.6%
	Yes	13	0.0%
Impact Coefficient: 2.2615, Std. Error: 1.058, <i>p</i> -value: 0.0325			
Average Marginal Effect: 0.0310			

6.4 DISCONNECTIONS

This section characterizes the pilot participants and matched control group with respect to disconnection events and disconnections. The main objective here is to ascertain whether the pilot led to a reduced number of disconnections following enrollment. It is worth reiterating here, that while the matched controls do not enroll in the pilot, their assumed pre- and post-periods are aligned with their matched participants, so disconnections are based on aligned time periods, which is important because the utilities were not consistent over time in their rates of disconnection.

Disconnection Summaries

The following section summarizes the counts of pilot participants and matched control accounts that experienced disconnections before and after enrollment, in addition to the average number of disconnections and arrears. If the CBO Pilot decreased arrears, we would expect pilot participants to have fewer disconnections than their matched non-participants in the post-period.

Note that for PG&E and SCE, disconnections and disconnection-related events, such as disconnection notices, were combined into one field and could not be separated. For SoCalGas and SDG&E, the disconnection field represented only true disconnections. More information on the disconnection data can be found in Section 4.3.2.

Disconnections varied by IOU during the pre- and post-enrollment periods:

- PG&E:
 - 8% of participants experienced disconnection events pre → 13% post-period
 - 8% of non-participants experienced disconnection events in pre → 11% post-period

- SCE:
 - 13% of participants experienced disconnection events pre → 14% post-period
 - 18% of non-participants experienced disconnection events pre → 24% post-period
- SDG&E:
 - 3% of participants experienced disconnection events pre → 20% post-period
 - 4% of non-participants experienced disconnection events pre → 18% post-period
- SoCalGas:
 - 0% of participants experienced disconnection events pre → 6% post-period
 - 0% of non-participants experienced disconnection events pre → 8% post-period

The findings listed above show that this population of customers experienced an increase in disconnection events in the post-period relative to the pre-period. The increase in disconnections is highest for SDG&E but there does not appear to be a connection between disconnections and pilot participation.

As seen in Table 6-41, for PG&E, the relative rates of disconnection are similar and overall and there is no evidence that the pilot reduced the number of PG&E pilot participants that experienced a disconnection.

TABLE 6-41: PG&E ARREARS SUMMARY BY DISCONNECTS AND CBO STATUS

CBO Participant Status	Disconnect Pre	Disconnect Post	Count	Mean Disconnects Pre	Mean Disconnects Post	Mean Arrears Pre	Mean Arrears Post
Matched Non-Participant	No	No	1,538	0.00	0.00	\$1,576	\$1,347
		Yes	177	0.00	1.08	\$1,653	\$1,265
	Yes	No	116	1.14	0.00	\$2,260	\$984
		Yes	31	1.16	1.16	\$1,563	\$1,045
Participant	No	No	1,508	0.00	0.00	\$1,583	\$1,412
		Yes	213	0.00	1.08	\$1,932	\$1,327
	Yes	No	114	1.11	0.00	\$1,613	\$1,194
		Yes	27	1.30	1.19	\$1,619	\$1,284

Assuming reconnection implies some effort to pay off arrearages, disconnections have a predictable effect on arrears, though not necessarily where one would expect it. All the groups for PG&E in Table 6-41 reduced their arrears in the post-period, but the largest decreases in arrearages are for customer that experienced a disconnection in the pre-period as they likely needed to make a large payment to reconnect their power. This is especially notable among the non-participants who show a decrease of \$1,276.

For SCE, (see Table 6-42) the pilot participants had distinctly lower rates of disconnection events in the pre-period. Similar to PG&E, both pilot participants and non-participants had higher shares with disconnection events in the post-period, but the increase was far larger for the non-participants.

TABLE 6-42: SCE ARREARS SUMMARY BY DISCONNECTS AND CBO STATUS

CBO Participant Status	Disconnect Pre	Disconnect Post	Count	Mean Disconnects Pre	Mean Disconnects Post	Mean Arrears Pre	Mean Arrears Post
Matched Non-Participant	No	No	153	0.00	0.00	\$1,512	\$1,742
		Yes	42	0.00	1.10	\$1,419	\$1,275
	Yes	No	29	1.03	0.00	\$1,842	\$1,563
		Yes	14	1.07	1.36	\$2,336	\$2,742
Participant	No	No	180	0.00	0.00	\$1,458	\$1,310
		Yes	28	0.00	1.07	\$1,678	\$1,346
	Yes	No	24	1.21	0.00	\$2,271	\$1,606
		Yes	6	1.17	1.00	\$3,333	\$2,604

SDG&E (see Table 6-43) customers had far lower rates of disconnects in the pre-period compared to the other two electric utilities. Both groups, however, exhibited large increases in disconnection events in the CBO post-period, with pilot participants and the control accounts moving to 20% and 18%, respectively.

TABLE 6-43: SDG&E ARREARS SUMMARY BY DISCONNECTS AND CBO STATUS

CBO Participant Status	Disconnect Pre	Disconnect Post	Count	Mean Disconnects Pre	Mean Disconnects Post	Mean Arrears Pre	Mean Arrears Post
Matched Non-Participant	No	No	480	0.00	0.00	\$1,223	\$1,054
		Yes	99	0.00	1.28	\$1,594	\$1,229
	Yes	No	17	1.12	0.00	\$2,186	\$1,386
		Yes	10	1.20	2.00	\$1,803	\$1,459
Participant	No	No	468	0.00	0.00	\$1,270	\$1,145
		Yes	117	0.00	1.29	\$1,527	\$1,216
	Yes	No	16	1.06	0.00	\$1,340	\$1,559
		Yes	5	1.00	1.40	\$819	\$730

These increases in disconnections are likely associated with factors unrelated to the pilot. To confirm that the rise in disconnections was not related to the pilot, Verdant looked at the disconnection data provided for all SDG&E CBO eligible accounts and there is a clear increase in disconnections. For 2024 and 2025, the two years with a full 12 months of data, there were 864, and 1,975 disconnections, respectively, or an increase of 229%. This is a smaller increase than we see for the pilot participants, but this group was experiencing higher levels of arrearages, which would logically correspond to more disconnects. The

control homes were selected to have similar attributes, which would support their higher level of disconnects.

As shown in Table 6-44, SoCalGas had no accounts with a disconnection in the pre-period that were in the final set of participants and matched non-participants, so the only disconnections occurred after pilot enrollment. In the post-enrollment period, the rate of disconnections is lower for both groups compared to the other IOUs, which is likely related to the more labor-intensive nature of disconnecting gas service, which cannot be done remotely. The 5.7% rate of disconnection for participants is lower than the 7.6% for the control group, but because there are no pre-enrollment disconnections, there is no way to assess if the pilot has led to fewer disconnections.

TABLE 6-44: SOCALGAS ARREARS SUMMARY BY DISCONNECTS AND CBO STATUS

CBO Participant Status	Disconnect Pre	Disconnect Post	Count	Mean Disconnects Pre	Mean Disconnects Post	Mean Arrears Pre	Mean Arrears Post
Matched Non-Participant	No	No	243	0.00	0.00	\$895	\$750
		Yes	20	0.00	1.10	\$1,349	\$1,295
Participant	No	No	248	0.00	0.00	\$892	\$768
		Yes	15	0.00	1.07	\$1,463	\$1,690

Pilot Disconnection Impacts

For disconnects, the anticipated effect of the pilot is the opposite of other programs. Whereas one would anticipate that participants would be more likely to enroll in CARE, AMP, or be funneled into ESA, with disconnects the preferred outcome would be a reduction in disconnection events. Consequently, we modeled pilot impacts on disconnections using the same logit model framework, with the dependent variable indicating whether an account experienced fewer disconnections after pilot enrollment (i.e., the dependent variable equals 1 if the home had fewer disconnections post and 0 otherwise).

The results of the logit models are presented in Table 6-45 through Table 6-47. For the three electric utilities, the logit models all showed no statistically significant impact of the pilot on disconnections. There are no logit results for SoCalGas, however. Because their customers had no disconnections in the pre-period, there were no reductions in customer disconnections due to the pilot.

For PG&E, as seen in Table 6-45, the predicted probability of a pilot participant who was disconnected in the pre-enrollment period seeing reduced disconnection events is 85.8%, but for the control group that probability is a very similar 82.3%. The AME is essentially zero. This is consistent with both the previous summary of disconnections by group and period as well as with the small and not statistically significant coefficient.

TABLE 6-45: PG&E LOGIT MODEL FINDINGS FOR FEWER DISCONNECTIONS BY CBO SCENARIO

CBO Participant Status	Disconnected in Pre-Period	Count	Predicted Disconnect Reduction Probability
Matched Non-Participant	No	1,715	0.0%
	Yes	147	82.3%
Participant	No	1,721	0.0%
	Yes	141	85.8%
Impact Coefficient: 0.2624, Std. Error: 0.324, <i>p</i> -value: 0.4181			
Average Marginal Effect: 0.0027			

For SCE, as seen in Table 6-46, there is a larger difference in the predicted probabilities, with participants being 83.3% likely to experience a decrease in disconnections compared to 69.8% for non-participants. However, the coefficient for the impact is not significant, so the relationship between pilot participation and any decline in disconnections is statistically insignificant and weak.

TABLE 6-46: SCE LOGIT MODEL FINDINGS FOR FEWER DISCONNECTIONS BY CBO SCENARIO

CBO Participant Status	Disconnected in Pre-Period	Count	Predicted Disconnect Reduction Probability
Matched Non-Participant	No	195	0.0%
	Yes	43	69.8%
Participant	No	208	0.0%
	Yes	30	83.3%
Impact Coefficient: 0.7732, Std. Error: 0.592, <i>p</i> -value: 0.1914			
Average Marginal Effect: 0.0208			

Finally, for SDG&E we see results similar to SCE's. As shown in Table 6-47, the pilot participants are nearly 10% more likely to experience a reduction in disconnections. However, the model did not result in a significant coefficient. In the case of both SCE and SDG&E, the smaller number of accounts contributed to the insignificant result.

TABLE 6-47: SDG&E LOGIT MODEL FINDINGS FOR FEWER DISCONNECTIONS BY CBO SCENARIO

CBO Participant Status	Disconnected in Pre-Period	Count	Predicted Disconnect Reduction Probability
Matched Non-Participant	No	579	0.0%
	Yes	27	66.7%
Participant	No	585	0.0%
	Yes	21	76.2%
Impact Coefficient: 0.4700, Std. Error: 0.655, <i>p</i> -value: 0.4731			
Average Marginal Effect: 0.0038			

7 CUSTOMER EXPERIENCE

To complement the impact evaluation, the evaluation team conducted a survey to better understand the participants' experience with the pilot. Table 7-1 shows the total population and number of completes from each IOU and CBO. In the results below, the CAPK (n=134) and MAAC (n=36) responses are generally representative of the population of customers served by the CBO, but for the other CBOs there were not enough responding participants (i.e., only 3-12 respondents per CBO) to represent each CBO. As such, SCE and SoCalGas are combined (n=29) to show the directional nature of those participants not served by CAPK or MAAC.

TABLE 7-1: OVERALL POPULATION AND NUMBER OF SURVEY COMPLETES FOR EACH IOU AND CBO

IOU	CBO	Population	Completes
PG&E	CAPK	2,390	134
SCE	CAPSBC	335	12
	UWTC	58	9
SoCalGas	FTBMI	154	3
	SBX	133	5
SDG&E	MAAC	704	36
Total		3,774	199

7.1 OVERALL SATISFACTION AND EXPERIENCE

Satisfaction with the pilot was good, but not universal. The majority (64%) indicated some level of satisfaction; however, roughly one in five respondents were dissatisfied with their experience. This value is largely driven by PG&E since roughly two-thirds of all respondents – and all participants in the pilot – are PG&E (CAPK) participants. When looking across IOUs, satisfaction varies (Figure 7-1),³⁴ and part of the variation in satisfaction could be driven by respondents' engagement with the pilot. Notably, ~80% of respondents recalled signing up for the pilot with only 49% self-reporting they met with a case manager (and some of these individuals actively chose to stop their participation early). This number may seem low given the pilot was designed to provide case management to all participants. There are a few important considerations to understand why only 49% self-reported meeting with a case manager:

³⁴ See Appendix C for a breakdown of all survey questions and responses by IOU.

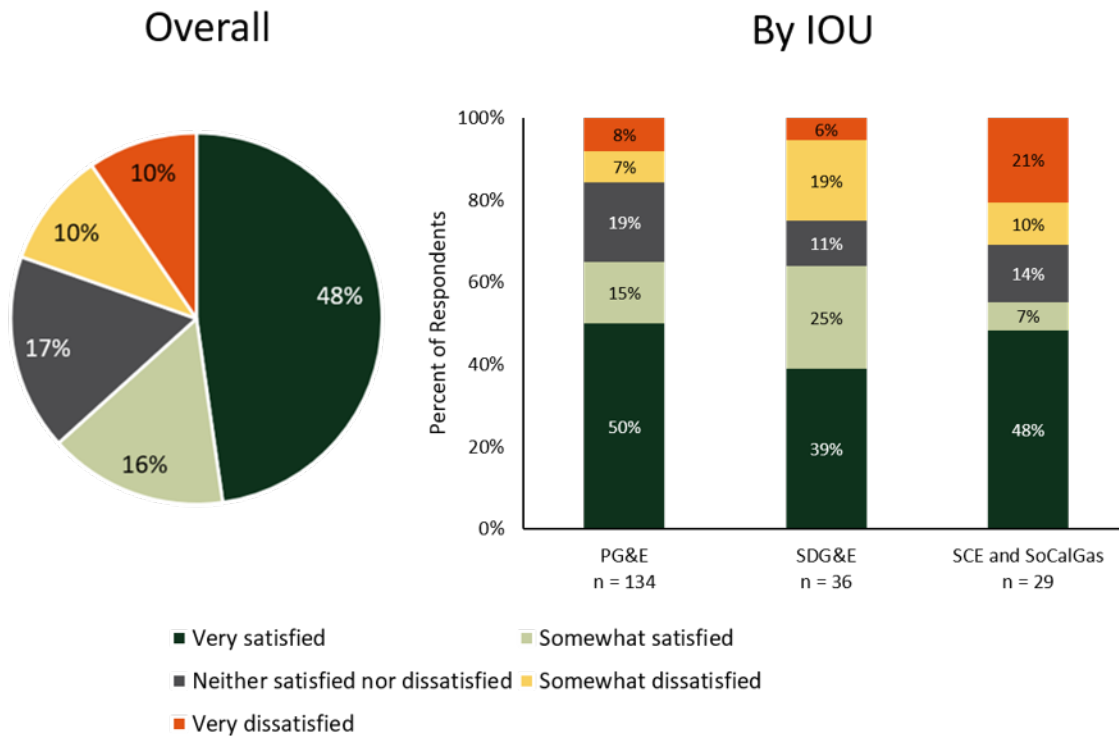
- Some case managers primarily communicated over email, text, or phone and while we worded the question to encompass these kinds of communications, some individuals may have answered that they didn't meet with a case manager if they only received email or text communications.³⁵
 - Email, text, and phone case management could still be impactful and provide necessary information to support participants getting into programs or combatting their debt (see Section 7.2 below for knowledge gained through the pilot – much of which was shared via email or text).
- Participants may not have equated initial meetings with case management and/or may not have expressed interest in follow-up case management. For example, one CBO did not pursue case management meetings if a participant's debt was eliminated with one LIHEAP payment.³⁶
- The high case manager to participant ratios of some CBOs (e.g., 300:1) may have made it challenging to offer case management services/or to all participants.
- Participants may not have responded to communications around scheduling case management touch points. (Note that some of these may also have subsequently been removed from the pilot for their inactivity; however, they are still considered participants in the pilot.)

For those who did engage with the pilot, 78% reported that they found their case manager helpful.

³⁵ Question: Did you ever meet or communicate with a case manager about your past due utility bills? This may have been by phone, video, in person, email, or text.

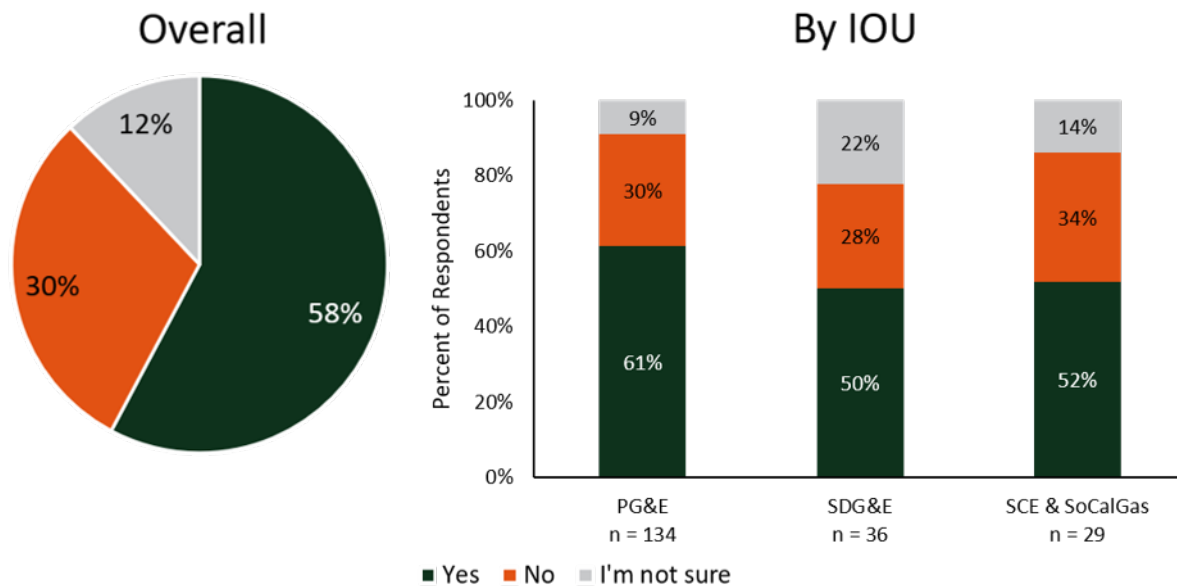
³⁶ The CBO who did not pursue additional case management was CAPSBC and they were the only CBO to show significant reduction in arrearages, suggesting multiple rounds of case management and interaction is not always needed to support debt relief.

FIGURE 7-1: SATISFACTION WITH THEIR EXPERIENCE WITH THE PILOT



When asked what was most helpful about the pilot, respondents pointed to help with lowering bills (i.e., the intended outcome) and receiving assistance from a designated case manager. Overall, around 58% of respondents believed that the pilot did help lower the amount they owed on their utility bill (Figure 7-2).

FIGURE 7-2: DID PARTICIPANTS BELIEVE THAT THE PILOT HELPED THEM LOWER THE AMOUNT THEY OWED

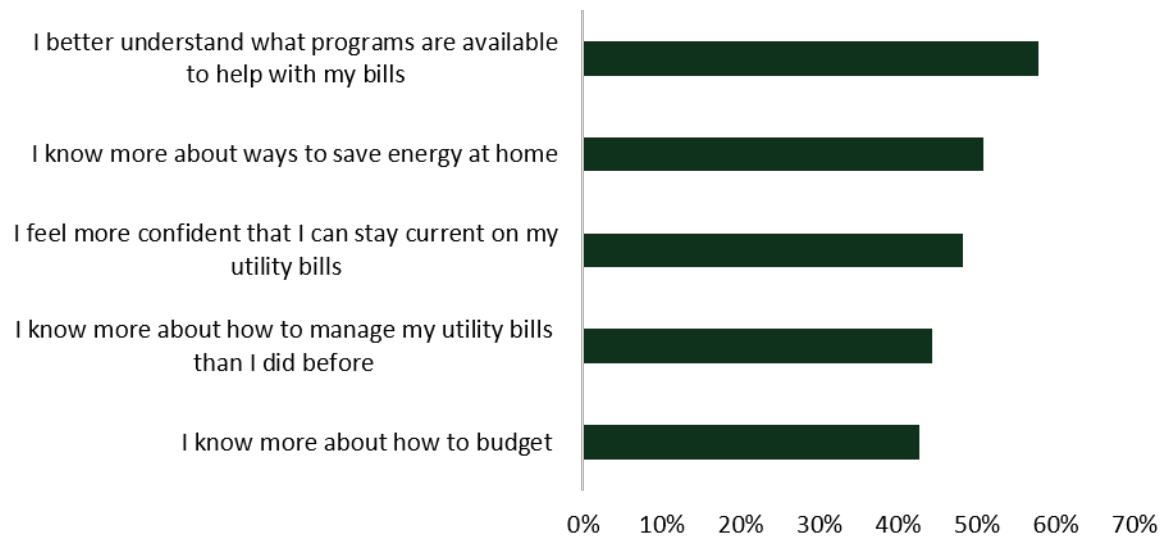


Participants were also asked if there was anything about the pilot that was frustrating or did not work well for them. Most participants (n = 137/199) indicated that there were no issues with the pilot. For those who did respond, their main reasons were not being able to get the help they needed (e.g., they didn't qualify, their debt was too high) or difficulty connecting with a case manager (e.g., it took too much time to connect with a case manager or the communication frequency wasn't enough for the customer).

7.2 VALUE BEYOND DIRECT ENERGY SAVINGS

In addition to reducing arrearages, a core part of the pilot was to educate participants on different aspects to support getting out of and staying out of debt. As such, we explored how participant knowledge changed since starting the pilot. Participant knowledge varied by IOU, but overall participants seemed to have gained knowledge by being in the pilot as 69% (n = 137) of respondents reported agreement to at least one of the questions in Figure 7-3.

FIGURE 7-3: PERCENTAGE OF PARTICIPANTS THAT INDICATED AN INCREASE IN KNOWLEDGE FROM THE PILOT



**Participants were asked, "Compared to before you signed the agreement form, how much do you agree/disagree with the following statements?". The percentages represented in this figure are for those participants who indicated 'Strongly Agree' and 'Agree'.*

As shown in Figure 7-3, the top area where participants gained knowledge was in understanding what programs are available to help with their bills. These survey results are reflected in the impact analysis on other program participation (Section 6.3) which shows an increase in AMP and LIHEAP participation for many of the IOUs.

For additional insights on customer experience, see Appendix C.

8 CONCLUSIONS

8.1 PILOT COSTS VS. IMPACT

A key component of the impact evaluation was to determine if the pilot impacts – including both quantitative impacts (changes in arrearages, program enrollment, etc.) and qualitative impacts (changes in energy and financial education, etc.) - sufficiently outweigh the costs to implement the pilot and thus support expansion of the pilot into a program. In this section we document the overall pilot implementation costs, costs for utility standard engagement, and the overall quantitative impact of the pilot to support our recommendation that the pilot should not be expanded.

The following information around pilot implementation costs and standard utility engagement is included in response to requirements in D. 24-02-046, that stated, ‘The Large Utilities will report which actions constitute standard utility engagement (for the control group) and the associated costs of standard utility engagement’. The evaluation team was provided text and costs by each of the IOUs. The evaluation team was not able to independently verify any of the costs provided below.

8.1.1 Pilot Implementation Costs

Budgets for the CBO Pilot were set by D. 24-02-046. Table 8-1 presents these original pilot budget categories across the four IOUs. These budgets were set based on the original larger participation pool that included additional zip codes and initial enrollment caps of 4,800 (PG&E), 4,800 (SCE and SoCalGas), and 2,400 (SDG&E). The original budget assumed an average spending of \$937 per participant.³⁷ Given limited CBO interest and participation in the pilot, the targeted zip codes and enrollment targets were subsequently reduced.

³⁷ Includes EM&V costs to be comparable to IOU reported costs. \$11,240,000/12,000 capped participants.

TABLE 8-1: ORIGINAL CBO PILOT BUDGET

Budget Category	PG&E	SCE	SoCalGas	SDG&E	Total
CBO Case Management Planning and Overhead	\$80,000	\$40,000	\$40,000	\$40,000	\$200,000
CBO Outreach, Customer Enrollment, and Reporting	\$1,100,000	\$550,000	\$550,000	\$550,000	\$2,750,000
CBO Case Management Services and Reporting	\$2,220,000	\$1,110,000	\$1,110,000	\$1,110,000	\$5,550,000
Total CBO Arrearage Case Management	\$3,400,000	\$1,700,000	\$1,700,000	\$1,700,000	\$8,500,000
EM&V	\$400,000	\$200,000	\$200,000	\$200,000	\$1,000,000
ME&O	\$185,000	\$60,000	\$60,000	\$50,000	\$355,000
IOU Administration*	\$415,000	\$450,000	\$120,000	\$400,000	\$1,385,000
Total IOU EM&V, ME&O, and Administration	\$1,000,000	\$710,000	\$380,000	\$650,000	\$2,740,000
Grand Total	\$4,400,000	\$2,410,000	\$2,080,000	\$2,340,000	\$11,240,000

*Includes SPOC lines

Table 8-2 shows the costs to administer the pilot that were provided by each of the IOUs. These costs reflect each IOUs actual expenditures associated with implementation of the CBO Pilot, including CBO contracts, ME&O, EM&V,³⁸ and administrative support provided through May 31, 2026. As shown in the table below, the overall statewide cost to implement the pilot was \$4,381,295, resulting in an average statewide cost per pilot participant of \$1,160. The implementation cost per participant differed by IOU from a low of \$873 for PG&E to a high of \$1,864 for SoCalGas. It should be noted that the overall per participant cost to implement the pilot as a full program would likely be lower as the pilot required additional upfront costs to get up and running, establish operating protocols, create data collection systems, and identify best practices to optimize future program implementation.

TABLE 8-2: OVERALL COST TO IMPLEMENT THE PILOT FOR EACH IOU

	PG&E	SCE	SoCalGas	SDG&E	Total
Cost to Implement Pilot	\$2,088,294	\$486,411	\$534,950	\$1,271,640	\$4,381,295
Pilot Participants	2,392	393	287	704	3,776
Average Implementation Cost/Participant	\$873	\$1,238	\$1,864	\$1,806	\$1,160

³⁸ The EM&V costs were allocated across that IOUs as follows: 40% for PG&E and 20% for each of the other three IOUs (SCE, SoCalGas, and SDG&E).

8.1.2 Overall Program Impact

To determine whether the pilot should be expanded into a full-scale program, we evaluated the overall impact of the pilot using both impact and customer experience data. Based on this review, we recommend against expanding the pilot into a full-scale program, given the limited arrearage reduction relative to the overall pilot cost and the low satisfaction reported by participants. While we note in Section 7.2 that 69% of survey respondents reported gaining some level of knowledge, this is outweighed by the pilot's limited impact on arrearage reductions (only one CBO achieved a statistically significant effect) and the cost of implementation, which was orders of magnitude greater than the arrearage reduction achieved. Together these findings do not justify continuing this pilot as a program. Additional evidence supporting this recommendation includes the following:

- The overall cost to implement the pilot was \$4,381,295, with an average cost of \$1,160 per participant. This is higher than the budgeted cost of \$937 per enrolled participant, suggesting the pilot was more costly to run than anticipated. It also exceeds the average arrearage reduction of \$495 for participants where a statistically significant impact was noted (CAPSBC).³⁹
- The total pilot-attributable impact on arrearages for SCE's CAPSBC CBO participants (the only CBO where a significant reduction in arrearages was observed) was \$194,535. This is orders of magnitude less than the overall cost to implement the pilot across all IOUs (>\$4M) and less than the cost to implement SCE's portion of the pilot (\$486,411).
- Overall pilot satisfaction was 64%. Many programs set a threshold of 80% satisfaction as a benchmark for success. Additionally, only 58% reported that the pilot helped lower their bills.

We reflect on other program models in section 8.2 that have had greater success with serving customers with utility needs and suggest alternatives for combatting arrearages in CA.

8.1.3 The Cost of Standard Utility Engagement

For this study the IOUs defined standard utility engagement as the services and assistance they provide to customers via their call centers. As described above, each IOU estimated the cost of providing standard utility engagement services to their customers. It's important to note that the services provided by IOU call centers are different from the services provided through the CBO Pilot and thus the costs of the two types of services are not directly comparable. Table 8-3 shows the ways in which the two types of services (those provided by call center vs. through the pilot) differ. The table below is illustrative and not an analytical comparison.

The cost of standard utility engagement is included in this section only because it is required under D. 24-02-046. Any evaluation of the IOU call centers is outside the scope of this evaluation; the information

³⁹ As calculated by the 2sDiD models.

below is simply provided to help show the point that the CBO Pilot and IOU call centers serve different niches and warn against comparing the costs to implement the two.

TABLE 8-3: KEY DIFFERENCES BETWEEN IOU CALL CENTER ENGAGEMENT AND THE CBO PILOT

Category	IOU Call Center	CBO Pilot
Outreach	Mostly inbound, some outbound	Outbound (calls, texts, emails, door to door, community events)
Services Offered	Utility-focused	Utility programs + wrap around services + education
Assistance Approach	Can instantly enroll customers into utility programs; do not offer case management	Work with customers to identify which programs they are eligible for, help customers prepare applications, cannot enroll customers into utility programs*

**While two CBOs were LIHEAP providers, LIHEAP is a federal program, not a utility program*

To calculate the cost of standard utility engagement, each IOU took an approach that best matched the services they provide to their customers. Below we share the documentation provided to us from each IOU on how they calculated these costs:

- **PG&E:** The cost of standard utility engagement represents the estimated annual cost of serving the same (pilot enrolled) customers through traditional utility call center operations and was calculated by multiplying 1) the average cost per customer call, 2) the number of calls received per customer on an annual basis, and 3) the 2,400 pilot enrolled customers.
- **SCE:** The cost of standard utility engagement represents an estimate of the cost to serve the same customers through traditional utility call center operations. The estimate was calculated based on the number of customers enrolled in the pilot, estimated customer touchpoints, the utility's average call handling time, and the utility's average call center labor rate.
- **SoCalGas:** The cost of standard utility engagement represents the estimated cost of serving the same customers through traditional utility call center operations and was calculated using customer enrollment volumes, estimated customer touchpoints, average call handling time, and the utility's average call center labor rate. The call center hourly rate used in the calculation is based on the rate specified in SoCalGas's call center contract. This comparison provides context on the costs associated with delivering customer engagement through community-based organizations versus traditional utility customer service channels.
- **SDG&E:** The cost of standard utility engagement represents the estimated cost of providing the same level of customer support through SDG&E's traditional customer service channels. This estimate was developed using SDG&E call center data to determine the proportion of call center time dedicated to credit-related customer interactions. To align with the pilot design, the analysis assumes four customer touchpoints per participant, consistent with the four sessions delivered by the community-based organization during the pilot. The estimated cost was calculated using the call center hourly labor rate and the time required for each customer interaction.

Table 8-4 shows the cost of providing Standard Utility Engagement services to pilot participants for each of the four IOUs participating in the pilot.

TABLE 8-4: COSTS OF PROVIDING STANDARD UTILITY ENGAGEMENT TO PILOT PARTICIPANTS

PG&E	SCE	SoCalGas	SDG&E	Total
\$15,144	\$8,844	\$5,378	\$13,833	\$43,199

8.2 FINAL REFLECTIONS AND RECOMMENDATIONS

The CBO Pilot provided individualized case management services to help customers address their arrearages. Only two of the participating CBOs were LIHEAP providers with the ability to directly assist in reducing arrearages, and only one of these CBOs made LIHEAP its top priority within the pilot. This left the remaining CBOs able only to share eligible utility programs (limited to low-income customers) and provide education to participants. As the impact results show, these information-forward approaches had no measurable effect on customer arrears. An impact was found only where LIHEAP was prioritized and provided immediately to participants alongside in-person education. The ineffectiveness of information-only approaches, combined with the pilot’s high implementation costs and low participation satisfaction, suggests that it should not be expanded into a full-scale program.

California currently has other programs where similar case management activities occur without some of the key challenges noted in this pilot. The best example is the Community Help and Awareness of Natural Gas and Electricity Services (CHANGES) program, which uses a network of 25 CBOs to serve limited-English speaking customers throughout the state. Many of the services offered through the CBO Pilot are also supported by CHANGES, including LIHEAP and CARE/FERA enrollment support, payment plan negotiation, and AMP enrollment. CHANGES also benefits from a standardized data collection system used across all 25 CBOs and an extensive training program to set caseworkers up for success. While CHANGES is not an arrearage-focused program, its extensive LIHEAP and AMP enrollment support⁴⁰ suggests it is likely helping to combat arrearages for this population. Given the demonstrated success of the CHANGES program and the limited impact of the CBO Pilot, we recommend that future pilot arrearage-focused initiatives be modeled more closely on the CHANGES program approach.

We document additional findings and recommendations for the pilot below.

⁴⁰ CHANGES Program Annual Report Program Year: July 1, 2024 – June 30th, 2025.

8.2.1 Program Impact Evaluation Findings and Recommendations

Findings

- A time-series analysis of arrearages found that many CBO participants were able to reduce their balances, though overall still continued to carry arrears. [Section 6.1] This same declining trend was observed among most non-participants, and the 2sDiD model confirmed that the reduction in arrearages for PG&E, SDG&E, and SoCalGas was not statistically significant. [Section 6.2.1] Across all utilities, the CBO Pilot had a limited overall impact on arrearages, with CAPSBC's (SCE) participants the only group to show a statistically significant reduction. [Section 6.2.1]
- When segmenting electric customers by NEM status, SCE's non-NEM customers were the only segment with a statistically significant decrease in arrears. All other segments showed no significant decline [Section 6.2.2].
- When looking at reductions in arrearages by customer unenrollment status, three customer segments had statistically significant results: [Section 6.2.3]
 - SCE participants who remained enrolled in the pilot had the largest statistically significant impact on arrearages (a \$359 reduction from the pre- to the post-period).
 - PG&E participants who remained enrolled in the pilot had a small (\$78) but statistically significant increase in arrears.
 - SDG&E participants who unenrolled from the pilot showed a statistically significant increase in arrears (\$162).
- The CBO Pilot led to a statistically significant increase in other program participation, with the largest marginal increase associated with LIHEAP enrollment for SCE's participants served by CAPSBC [Section 6.3].
 - While the CBO Pilot increased enrollment in several programs, the increase was typically limited to a marginal increase of ten percentage points or less. This modest increase in other program participation may have reduced arrears for a small number of customers, but it likely had little effect on the overall average arrearages of participants relative to non-participants.
 - SCE's CAPSBC increased participants' enrollment in LIHEAP by over 50% and this increase in LIHEAP enrollment is likely responsible for the CBO's impact on arrears.
- Prior to the pilot, SCE's and SDG&E's eligible populations had a high rate of enrollment in the low-income CARE rate (70-90% of both participants and non-participants). This left few opportunities for CBOs to further increase CARE enrollment levels within these populations[Section 6.3.1].
 - PG&E's pre-pilot CARE enrollment share was 53% for participants and 56% for non-participants, leaving a substantial share of eligible customers unenrolled. By the end of the post-pilot period, 89% of participants and 80% of non-participants were enrolled in CARE. Because enrollment increased in both participant and non-participant groups, it is likely that most of the increase is attributable to PG&E's broad ME&O efforts; the pilot's marginal impact accounts for a 10.7 percentage point increase in participant enrollment.

- SDG&E pilot participants saw a smaller, but also statistically significant impact on CARE enrollment, with pilot participation in SDG&E's pilot accounting for a 6.95 percentage point increase in participants' CARE enrollment in the post-period.
- Pilot participation for SCE and SoCalGas did not lead to a statistically significant increase in CARE enrollment.
- Across utilities, enrollment in the CBO Pilot caused a statistically significant increase in AMP enrollment [Section 6.3.2].
- SCE's CAPSBC increased participants' LIHEAP enrollment by over 50%, and this increase is likely responsible for CAPSBC impact on arrears [Section 6.3.3].
- PG&E's pilot participants saw a small but statistically significant increase in LIHEAP enrollment, with an estimated marginal effect of 0.09 [Section 6.3.3].
- PG&E's CBO Pilot led to a small (approximately five percentage points) but statistically significant increase in ESA enrollment. PG&E's pilot eligible population consumes substantially more electricity than the average home in PG&E's territory, which helps to explain their high arrearage levels [Section 6.3.4].
- PG&E's CBO Pilot led to a small, but statistically significant difference between participants and non-participants who received MMP relief in the post-period, with participants enrolling at a higher rate (7.9%) than non-participants (2.9%) [Section 6.3.5].
- PG&E's CBO Pilot led to a small but statistically significant increase in REACH enrollment of approximately 4 percentage points [Section 6.3.5].
- SDG&E's CBO pilot caused a 2.4 percentage-point increase in the predicted probability of enrolling in SDG&E's NTN as a participant in the pilot compared to a non-participant [Section 6.3.5].
- Participation in SoCalGas's Pilot led to a 3.3 percentage-point increase in customers' predicted probability of enrolling in GAF [Section 6.3.5].
- Despite the significant increased enrollment in other utility programs, with the exception of LIHEAP and CAPSBC, there is no evidence that this resulted in any significant decrease in arrearage levels. The number of increased participants in these programs was too few and/or the impacts were too small [Section 6].
- Participants and non-participants across utilities experienced an increase in disconnection events in the post-period compared to the pre-period [Section 6.3.5].
- The pilot had no statistically significant impact on customer disconnections [Section 6.3.5].

Recommendations

- Many of the CBO Pilot's impacts appear to be associated with increased participation in other programs designed to reduce arrears, energy usage, or bills. Depending on the actual time of enrollment, some of these other programs may take time to show CBO Pilot impacts. For example, customers that enrolled in AMP seven months after pilot enrollment will not show the full effect on arrears until well after the pilot's one year post-enrollment period is over.⁴¹ Extending the period of observation for up to another year could determine whether enrollment in those other programs results in an actual reduction of arrears.
- CAPSBC had the largest marginal impact on LIHEAP enrollments, directly combating and reducing participant debt. Results from this pilot suggest that debt reduction impacts derive from direct debt relief paired with education and instant program enrollment assistance (as was the case with CAPSBC and LIHEAP).
- Given the relatively high energy usage of PG&E's eligible population, targeting ESA to customers with high energy and high arrearages could help these customers reduce their usage, reduce their arrears, and maintain their utility bill payment.
- With the high cost of the pilot and the small overall impact on arrears, there is no justification for rolling out the CBO Pilot to a broader population as a utility program.

8.2.2 Customer Experience Findings

- 64% of respondents indicated some level of satisfaction, but one in five respondents were dissatisfied with their experience. [Section 7.1]
- 58% of respondents believed the pilot helped them lower the amount they owed; 30% said it didn't. [Section 7.1]
- 69% of respondents indicated they learned something during the pilot. Respondents gained more knowledge in the following areas: [Section 7.2]
 - What programs were available to help lower bills
 - Ways to save energy
 - How to stay current on utility bills
 - How to manage their utility bills
 - How to budget

⁴¹ Some programs in which pilot participants enrolled, such as AMP and CARE, have gradual effects on customer bills and arrearages. As a result, the full impact of these programs may not be observable within the study period. For example, under AMP, a customer's eligible debt is forgiven after 12 months of remaining current on their bills. If a participant customer enrolled in AMP in March 2026 and the analysis only includes data through May 2026, the analysis would capture only the initial months following enrollment and would not reflect the program's full potential impact on the customer's arrearages.

8.2.3 Pilot Cost Findings and Recommendations

Findings

- The total cost to implement the CBO Pilot was \$4,381,295 with an average cost per participant of \$1,160. [Section 8.1.1]
- The total cost of standard utility engagement was \$43,199. [Section 8.1.3]
- The total pilot attributable impact on arrearages was \$194,535 with an average arrearage reduction of \$495. This is significantly less than the cost to implement the pilot and the per participant cost [Section 8.1.2]
- Even just using SCE (as their CBO was the only one to have a significant impact on the pilot), the overall cost to implement the pilot was \$486,411 and the per participant cost was \$1,238. [Section 8.1.1]
- The CBO Pilot was unsuccessful in reducing arrearages for all participants except for those who worked with CAPSBC. The average reduction in arrears for these participants was \$495, but it cost, on average, \$1,238 per participant to run the pilot for SCE. The lack of pilot impacts on arrearages, the cost difference between how much arrears were reduced vs. how much was spent to reduce the arrears, and the dissatisfaction of survey respondents (<80% satisfaction) supports the assertion that the pilot was unsuccessful in meeting its objectives. [Section 8.1]

Recommendations

- Given the costs to implement the pilot, the limited arrearage reduction impact, and the low customer satisfaction with the pilot, we do not recommend the pilot be expanded into a program.
 - Future arrearage pilots and efforts should consider following an established and successful case management model, such as the CHANGES program.



APPENDIX A CBO PROCESS EVALUATION REPORT

Click on the link below to access the CBO Process Evaluation that was completed March 10th, 2026.



CBO_Pilot_Process_E
valuation_FINAL_03_1

APPENDIX B CBO PROCESS RECOMMENDATIONS

Click on the link below to access the CBO process recommendations.



CBO_Recommendati
ons_04_17_26.pdf

APPENDIX C CBO PILOT SUMMARY OF SURVEY RESULTS

Click on the link below to access the



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APPENDIX D PROGRAM CONTINGENCY TABLES

D.1 CARE CONTINGENCY TABLES

TABLE D-1: PG&E CBO PILOT PARTICIPATION BY MOVE TO CARE IN POST CONTINGENCY TABLE

CBO Participant Status	Moved to CARE in Post	
	Did not Move to CARE	Moved to CARE
Matched Non-Participant	Observed: 1,290 (69.3%) Expected: 1,188 (63.8%)	Observed: 572 (30.7%) Expected: 674 (36.2%)
Participant	Observed: 1,086 (58.3%) Expected: 1,188 (63.8%)	Observed: 776 (41.7%) Expected: 674 (36.2%)

1 $\chi^2 = 47.914$, $p = 0.0000$, $dof = 1$, Cramér's $V = 0.1134$

TABLE D-2: SCE CBO PILOT PARTICIPATION BY MOVE TO CARE IN POST CONTINGENCY TABLE

CBO Participant Status	Moved to CARE in Post	
	Did not Move to CARE	Moved to CARE
Matched Non-Participant	Observed: 211 (88.7%) Expected: 212 (89.3%)	Observed: 27 (11.3%) Expected: 26 (10.7%)
Participant	Observed: 214 (89.9%) Expected: 212 (89.3%)	Observed: 24 (10.1%) Expected: 26 (10.7%)

1 $\chi^2 = 0.088$, $p = 0.7669$, $dof = 1$, Cramér's $V = 0.0136$

TABLE D-3: SDG&E CBO PILOT PARTICIPATION BY MOVE TO CARE IN POST CONTINGENCY TABLE

CBO Participant Status	Moved to CARE in Post	
	Did not Move to CARE	Moved to CARE
Matched Non-Participant	Observed: 594 (98.0%) Expected: 590 (97.4%)	Observed: 12 (2.0%) Expected: 16 (2.6%)
Participant	Observed: 586 (96.7%) Expected: 590 (97.4%)	Observed: 20 (3.3%) Expected: 16 (2.6%)

1 $\chi^2 = 1.573$, $p = 0.2098$, $dof = 1$, Cramér's $V = 0.0360$

TABLE D-4: SOCALGAS CBO PILOT PARTICIPATION BY MOVE TO CARE IN POST CONTINGENCY TABLE

CBO Participant Status	Moved to CARE in Post	
	Did not Move to CARE	Moved to CARE
Matched Non-Participant	Observed: 242 (92.0%) Expected: 245 (93.2%)	Observed: 21 (8.0%) Expected: 18 (6.8%)
Participant	Observed: 248 (94.3%) Expected: 245 (93.2%)	Observed: 15 (5.7%) Expected: 18 (6.8%)

1 $\chi^2 = 0.745$, $p = 0.3879$, $dof = 1$, Cramér's $V = 0.0376$

D.2 AMP CONTINGENCY TABLES

TABLE D-5: PG&E CBO PILOT PARTICIPATION BY MOVE TO AMP IN POST CONTINGENCY TABLE

CBO Participant Status	Moved to AMP in Post	
	Did not Move to AMP	Moved to AMP
Matched Non-Participant	Observed: 1,415 (76.0%) Expected: 1,338 (71.9%)	Observed: 447 (24.0%) Expected: 524 (28.1%)
Participant	Observed: 1,262 (67.8%) Expected: 1,338 (71.9%)	Observed: 600 (32.2%) Expected: 524 (28.1%)

1 $\chi^2 = 30.697$, $p = 0.0000$, $dof = 1$, Cramér's $V = 0.0908$

TABLE D-6: SCE CBO PILOT PARTICIPATION BY MOVE TO AMP IN POST CONTINGENCY TABLE

CBO Participant Status	Moved to AMP in Post	
	Did not Move to AMP	Moved to AMP
Matched Non-Participant	Observed: 1,415 (76.0%) Expected: 1,338 (71.9%)	Observed: 447 (24.0%) Expected: 524 (28.1%)
Participant	Observed: 1,262 (67.8%) Expected: 1,338 (71.9%)	Observed: 600 (32.2%) Expected: 524 (28.1%)

1 $\chi^2 = 7.912$, $p = 0.0049$, $dof = 1$, Cramér's $V = 0.1289$

TABLE D-7: SDG&E CBO PILOT PARTICIPATION BY MOVE TO AMP IN POST CONTINGENCY TABLE

CBO Participant Status	Moved to AMP in Post	
	Did not Move to AMP	Moved to AMP
Matched Non-Participant	Observed: 598 (98.7%) Expected: 592 (97.7%)	Observed: 8 (1.3%) Expected: 14 (2.3%)
Participant	Observed: 586 (96.7%) Expected: 592 (97.7%)	Observed: 20 (3.3%) Expected: 14 (2.3%)

1 $\chi^2 = 4.424$, $p = 0.0354$, $dof = 1$, Cramér's $V = 0.0604$

TABLE D-8: SOCALGAS CBO PILOT PARTICIPATION BY MOVE TO AMP IN POST CONTINGENCY TABLE

CBO Participant Status	Moved to AMP in Post	
	Did not Move to AMP	Moved to AMP
Matched Non-Participant	Observed: 233 (88.6%) Expected: 222 (84.6%)	Observed: 30 (11.4%) Expected: 40 (15.4%)
Participant	Observed: 212 (80.6%) Expected: 222 (84.6%)	Observed: 51 (19.4%) Expected: 40 (15.4%)

1 $\chi^2 = 5.837$, $p = 0.0157$, $dof = 1$, Cramér's $V = 0.1053$

D.3 LIHEAP CONTINGENCY TABLES

TABLE D-9: PG&E CBO PILOT PARTICIPATION BY MOVE TO LIHEAP IN POST CONTINGENCY TABLE

CBO Participant Status	Moved to LIHEAP in Post	
	Did not Move to LIHEAP	Moved to LIHEAP
Matched Non-Participant	Observed: 1,768 (95.0%) Expected: 1,688 (90.6%)	Observed: 94 (5.0%) Expected: 174 (9.4%)
Participant	Observed: 1,607 (86.3%) Expected: 1,688 (90.6%)	Observed: 255 (13.7%) Expected: 174 (9.4%)

1 $\chi^2 = 80.938$, $p = 0.0000$, $dof = 1$, Cramér's $V = 0.1474$

TABLE D-10: SCE CBO PILOT PARTICIPATION BY MOVE TO LIHEAP IN POST CONTINGENCY TABLE

CBO Participant Status	Moved to LIHEAP in Post	
	Did not Move to LIHEAP	Moved to LIHEAP
Matched Non-Participant	Observed: 234 (98.3%) Expected: 182 (76.3%)	Observed: 4 (1.7%) Expected: 56 (23.7%)
Participant	Observed: 129 (54.2%) Expected: 182 (76.3%)	Observed: 109 (45.8%) Expected: 56 (23.7%)

1 $\chi^2 = 125.513$, $p = 0.0000$, $\text{dof} = 1$, Cramér's $V = 0.5135$

TABLE D-11: SDG&E CBO PILOT PARTICIPATION BY MOVE TO LIHEAP IN POST CONTINGENCY TABLE

CBO Participant Status	Moved to LIHEAP in Post	
	Did not Move to LIHEAP	Moved to LIHEAP
Matched Non-Participant	Observed: 515 (85.0%) Expected: 515 (85.0%)	Observed: 91 (15.0%) Expected: 91 (15.0%)
Participant	Observed: 515 (85.0%) Expected: 515 (85.0%)	Observed: 91 (15.0%) Expected: 91 (15.0%)

1 $\chi^2 = 0.000$, $p = 1.0000$, $\text{dof} = 1$, Cramér's $V = 0.0000$

TABLE D-12: SOCALGAS CBO PILOT PARTICIPATION BY MOVE TO LIHEAP IN POST CONTINGENCY TABLE

CBO Participant Status	Moved to LIHEAP in Post	
	Did not Move to LIHEAP	Moved to LIHEAP
Matched Non-Participant	Observed: 257 (97.7%) Expected: 258 (97.9%)	Observed: 6 (2.3%) Expected: 6 (2.1%)
Participant	Observed: 258 (98.1%) Expected: 258 (97.9%)	Observed: 5 (1.9%) Expected: 6 (2.1%)

1 $\chi^2 = 0.000$, $p = 1.0000$, $\text{dof} = 1$, Cramér's $V = 0.0000$

D.4 ESA CONTINGENCY TABLES

TABLE D-13: PG&E CBO PILOT PARTICIPATION BY MOVE TO ESA IN POST CONTINGENCY TABLE

CBO Participant Status	Moved to ESA in Post	
	Did not Move to ESA	Moved to ESA
Matched Non-Participant	Observed: 1,701 (91.4%) Expected: 1,660 (89.1%)	Observed: 161 (8.6%) Expected: 202 (10.9%)
Participant	Observed: 1,618 (86.9%) Expected: 1,660 (89.1%)	Observed: 244 (13.1%) Expected: 202 (10.9%)

1 $\chi^2 = 18.628$, $p = 0.0000$, $\text{dof} = 1$, Cramér's $V = 0.0707$

TABLE D-14: SCE CBO PILOT PARTICIPATION BY MOVE TO ESA IN POST CONTINGENCY TABLE

CBO Participant Status	Moved to ESA in Post	
	Did not Move to ESA	Moved to ESA
Matched Non-Participant	Observed: 225 (94.5%) Expected: 224 (93.9%)	Observed: 13 (5.5%) Expected: 14 (6.1%)
Participant	Observed: 222 (93.3%) Expected: 224 (93.9%)	Observed: 16 (6.7%) Expected: 14 (6.1%)

1 $\chi^2 = 0.147$, $p = 0.7015$, $\text{dof} = 1$, Cramér's $V = 0.0176$

TABLE D-15: SDG&E CBO PILOT PARTICIPATION BY MOVE TO ESA IN POST CONTINGENCY TABLE

CBO Participant Status	Moved to ESA in Post	
	Did not Move to ESA	Moved to ESA
Matched Non-Participant	Observed: 596 (98.3%) Expected: 594 (98.0%)	Observed: 10 (1.7%) Expected: 12 (2.0%)
Participant	Observed: 592 (97.7%) Expected: 594 (98.0%)	Observed: 14 (2.3%) Expected: 12 (2.0%)

1 $\chi^2 = 0.383$, $p = 0.5362$, $\text{dof} = 1$, Cramér's $V = 0.0178$

TABLE D-16: SOCALGAS CBO PILOT PARTICIPATION BY MOVE TO ESA IN POST CONTINGENCY TABLE

CBO Participant Status	Moved to ESA in Post	
	Did not Move to ESA	Moved to ESA
Matched Non-Participant	Observed: 258 (98.1%) Expected: 258 (97.9%)	Observed: 5 (1.9%) Expected: 6 (2.1%)
Participant	Observed: 257 (97.7%) Expected: 258 (97.9%)	Observed: 6 (2.3%) Expected: 6 (2.1%)

1 $\chi^2 = 0.000$, $p = 1.0000$, $\text{dof} = 1$, Cramér's $V = 0.0000$