



Demand Side Analytics

DATA DRIVEN RESEARCH AND INSIGHTS

FINAL EVALUATION PLAN

PY 2025 SDG&E Small CPP Critical Peak Pricing Impact Evaluation



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1 INTRODUCTION

This evaluation plan lays out the requirements and analysis approach to evaluate load impacts for SDG&E's Small Commercial and Agricultural CPP-TOU rates. Since no CPP event days were called in 2025, no new ex post results will be reported. The analysis will instead involve incorporating the 2023-2024 estimated impacts into an ex ante forecast.

There are two main objectives for this evaluation plan. The primary objective is to engage in science and avoid after-the-fact analysis, where there is a temptation to modify models to find the desired results. This requires:

- Specifying the intervention and documenting the hypothesis
- Establishing the sample size and the ability to detect a meaningful effect
- Identifying the data that will be collected and analyzed
- Identifying the outcomes that will be analyzed and segments of interest, and
- Documenting in advance the statistical techniques and models that will be used to estimate energy savings and demand reductions.

The goal is to leave little to no ambiguity regarding what data will be collected or how the data will be analyzed. The secondary objective is to comply with the California Load Impact Evaluation Planning Protocols.¹

1.1 SUMMARY OF SDG&E'S SMALL CPP RATES

A brief summary of SDG&E's Small CPP rates is outlined in the table below:

Table 1: Summary of SDG&E's Small Commercial & Agricultural CPP-TOU Rates

Rate Feature	Response
Peak Window	4-9 pm year round (previously was 2-6 pm until PY 2022)
Number of Events (2025)	0
Event Triggers	Day-ahead system load forecast > 4,000 MW (Can also be triggered for high temp.'s, extreme conditions, emergencies)

¹ The full set of load impact protocols can be found here: <https://www.cpuc.ca.gov/industries-and-topics/electrical-energy/electric-costs/demand-response-dr/demand-response-load-impact-protocols>, with additional updates here: <https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M549/K296/549296803.PDF>

Rate Feature	Response
Default rate for C&I customers (bundled)?	Yes
CCAs included?	No
Incentive	Lower energy rates (per kWh) during other summer peak hours (demand charges vary)
Bill Protection	Yes, for first year
Loads for Impact Evaluation	Net loads

1.2 CALIFORNIA LOAD IMPACT PROTOCOLS

The California Load Impact Protocols require that for every demand response program and dynamic evaluation, an evaluation plan be produced that establishes a budget, a schedule, and a preliminary approach to meeting the evaluation and reporting requirements. The evaluation plan should also develop an approach to determine what additional requirements, if any, will be met in order to address needs that may arise for long-term resource planning or other applications, such as customer settlement or CAISO operations.

At a high level, the requirements for a load impact evaluation are to provide:

- Impact estimates for each of the 24 hours on various event-day types for event-based resource options (and other day types for non-event based resources)
- Uncertainty-adjusted impacts, reported for the 10th, 30th, 50th, 70th, and 90th percentiles, reflecting the uncertainty associated with the precision of the model parameters and potentially reflecting uncertainty in key drivers of demand response, such as weather
- Outputs that utilize a common format for ex post evaluation (a slightly different reporting format is required for ex ante estimation)
- Ex ante estimates for each day type
- Various statistical measures so that reviewers can assess the accuracy, precision and other relevant characteristics of the impact estimates
- Ex ante estimates that utilize all relevant information from ex post evaluations whenever possible, even if it means relying on studies from other utilities or jurisdictions
- Detailed reports that document the evaluation objectives, impact estimates, methodology, and recommendations for future evaluations

1.3 SUMMARY OF STUDY DESIGN AND EVALUATION CRITERIA

Table 2 lists the study design question in the California Load Impact Protocols and details how the evaluation plan addresses each study design issue:

Table 2: Study Design Questions

#	Study Design Question	Response
1	Will the evaluation rely on a control group?	n/a – No PY 2025 events for ex post. Previous years' ex post estimates, which will be used in the ex ante projections, used control groups.
2	Will the evaluation rely on data from non-event days to establish a baseline?	n/a – No PY 2025 events for ex post.
3	Will the study rely on a sample or include the full population of participants?	Full population.
4	Is the study designed to detect a specific effect size? And, if so, how was statistical power assessed?	No. We anticipate sufficient precision from sample sizes at least as large as in previous evaluations.
5	What is the study's threshold for statistical significance?	90% confidence using a two-tailed test
6	What is the size of the control and treatment groups, if applicable?	n/a – No PY 2025 events for ex post.
7	How will the evaluation address outliers?	n/a – No PY 2025 events for ex post. In previous years, individual customer regressions were used for sites with outlier loads.
8	How will the evaluation address attrition?	Ex ante projections will incorporate any information about changes in enrollments over time.
9	How will standard errors be calculated?	Calculated in previous ex post evaluations.
11	Will energy savings be estimated?	No
12	Will overlap with energy efficiency programs be estimated?	No

2 GENERAL APPROACH AND METHODS

The primary goal of any load impact evaluation is to answer two key questions:

1. What were the ex post load impacts in the current evaluation period?
2. What are the program's estimated load impacts going forward?

This second question is of particular importance as it can be leveraged for long term resource planning and DR capacity for resource adequacy.

In this document, we focus on developing a plan to produce unbiased ex post estimates, with these estimates then fed into a robust ex ante estimation process. Key issues to be addressed in developing the ex post and ex ante impacts are summarized in Table 3:

Table 3: General Considerations for CPP Load Impact Evaluations

Evaluation Consideration	Framework
Will both ex post and ex ante impacts be produced?	No, only ex ante for PY 2025.
What, if any, changes are expected over the forecast horizon to either the program or participant characteristics? Should these be incorporated into ex ante estimates?	SDG&E program staff will provide a summary of expected program changes, which will be incorporated into the analysis. Previous years' evaluations have included large migrations to CCAs, significantly reducing enrollments, but no such changes are currently anticipated. SDG&E is also responsible for developing an ex ante enrollment forecast, including assumptions that account for any such changes.
Will impact persistence be explicitly incorporated into the analysis?	Program impacts can be compared to impacts from previous years and assessed for changes, but they have been generally stable over time so a formal persistence analysis is not planned.
Is M&V activity needed to address the issue of persistence or of program changes?	As impact evaluations are conducted annually, no additional M&V activities are expected to be leveraged to monitor persistence.
Will impacts be developed for geographic sub-regions? If so, what are these sub-regions?	Yes, impacts will be reported by climate zone. Previous ex post impacts have been segmented by geographic group (Coastal vs. Inland) and event notifications (notified vs. non), as well as industry groups, NEM, etc.
Will impacts be developed for participant sub-segments? If so, what are these sub-segments?	Yes, industry, dual enrollments, AutoDR, customers receiving notifications, NEM, and large generators.

Evaluation Consideration	Framework
	The commercial and agricultural rate classes will also be evaluated separately.
Will impacts be developed for sub-hourly intervals?	No. Impacts will be reported at an hourly level.
Will impact estimates be developed for additional day types beyond what the protocol specifies?	Ex ante impacts will be reported for a monthly average day and a monthly peak day under 1-2 weather conditions.
Will any additional investigations be conducted to determine why the impacts are what they are, rather than simply reporting the estimates?	Ongoing involvement with SDG&E program staff should provide expert context to program performance, but no additional metering or analysis will be performed.
Are there expected to be free riders or structural winners among program participants? If so, will there be efforts to identify their number or frequency within all participants?	The incidence of free ridership is expected to vary based on program design and participant makeup. In general, programs that rely on control groups will address issues of free ridership.

2.1 KEY RESEARCH QUESTIONS

Different evaluation methods will be applied to different sites, depending on the number of potential control group sites in their respective subgroups. However, the overall goals for each subgroup's evaluation are the same—to answer these key research questions:

- What is the ex-ante load reduction capability for 1-in-2 weather conditions? How well do these reductions align with prior ex-post results and ex-ante forecasts?
- How do ex ante load impacts vary for different locations?
- What concrete steps can be undertaken to improve program performance?

2.2 EX-ANTE IMPACTS

A key objective of the DR evaluations is to quantify the relationship between demand reductions, temperature, hour-of-the-day, and dispatch strategy. The purpose of doing so is to establish the demand reduction capability under 1-in-2 and 1-in-10 weather conditions for planning purposes and, increasingly, for operations. When possible, we rely on the historical event performance to forecast ex-ante impacts for future years for different operating conditions.

The process of estimating ex-ante impacts essentially involves:

1. Use at least two years of historical performance data
2. Decide on an adequate segmentation to reflect how the customer mix evolves over time
3. Estimate the relationship between reference loads and weather
4. Use the models to predict reference loads for 1-in-2 weather conditions
5. Estimate the relationship between weather and percent impacts

6. Predict percent reductions for different weather conditions (and/or dispatch hours)
7. Combine the reference loads (#4) and percent reductions (#6) to produce per-customer impacts
8. Multiply per-customer impacts by the enrollment forecast

The process can be used to develop ex-ante estimates of demand reduction as a function of temperature, event start time, and event duration. It can be used to develop estimates for 1-in-2 weather-year planning conditions, and it can be used to develop time-temperature matrices useful for estimating reduction capability for operations or a wider range of planning conditions.

The conversion of ex post impacts to an ex ante forecast should be transparent and understandable to outside stakeholders. In general, the differences between the two are due to several key distinctions:

1. **Customer Mix:** Difference in participant population mix or forecasted enrollment
2. **Weather:** Ex post observed weather may be hotter or colder than ex ante planning conditions
3. **Event Time:** Ex post events may not occur during the RA window for which ex ante impacts are developed
4. **Historical Data:** Ex ante data should explicitly incorporate multiple years of impacts, so average impacts may change when additional years of ex post data are included
5. **Program Design:** If dispatch strategy, eligible months, or program participation options change, ex post impacts may not represent the future capability of the program

As part of the reporting process, we will capture the impact each of these changes has on the difference between ex post and ex ante impact estimates.

Finally, as the results of demand response impact evaluations are increasingly used to support operational concerns, the evaluation team will also provide time-temperature matrices for all subgroups. These matrices will rely on the ex ante impact estimates to predict, for different event start times, durations, and weather conditions, what the average customer hourly impact could be. This will be provided to SDG&E's program staff separately from the ex ante load impact tables.

For each subgroup, a slice-of-day table will be provided in addition to the standard weather year ex-ante impact tables. A slice-of-day table shows the hourly impacts for the worst day of each month based on the year selected.

PROGRAM-SPECIFIC VERSUS PORTFOLIO-ADJUSTED IMPACTS

In PY 2024, SDG&E Small CPP customers only had relevant dual enrollments with ELRP. For the SDG&E portfolio, CPP impacts were counted before any ELRP impacts, so it was not necessary to net out any other program's impacts from the CPP estimates. As such, we anticipate that the CPP program-specific and portfolio-adjusted impacts will be the same. In the event that new dual enrollment groups are now present on CPP rates, these will be discussed with SDG&E to determine the order in which programs will be counted for portfolio-adjusted impacts.

2.3 EXECUTIVE SUMMARY AND CPUC ENERGY DIVISION REQUESTS

A requirement over the last several years has been to provide supplemental reporting to the Energy Division for long term planning. For all programs in utilities' PY 2025 portfolio, several additional reporting features are due to the CPUC on or before November of 2025. Demand Side Analytics will provide these per the requirements below, with both a public and confidential version enclosed:

1. Ex Ante Load Impacts in plain Excel format: Portfolio aggregate ex-ante load impacts for 1-in-2 weather year monthly system peaks for each of the 10 ex-ante forecast years, for both the SDG&E's service area. Due on or before April 1, 2026
2. Portfolio aggregate ex-ante load impacts by program for 1-in-2 year August system peak for each of the full ex-ante forecast period years, disaggregated by WECC busbar. Due by November 1, 2026
3. Portfolio aggregate ex-ante load impact by program for the 1-in-2 weather year monthly system peak in the final year of the forecast, for all program operating hours (not just RA window). Document the methods used to estimate non-RA hour impacts. Due by November 1, 2026

3 QUALITY CONTROL PROCEDURES

The Demand Side Analytics team takes analysis accuracy seriously. We have several processes in place to ensure all data management, analysis, and reporting are delivered with the highest quality. A summary of our philosophy, however, is enumerated below:

1. **There is clear oversight in each project by an expert in Demand Response evaluation.** Our senior staff are familiar with the types of programs being evaluated, the preferred methods and their respective strengths and weaknesses, and the California demand response landscape. We understand these programs and their evaluation challenges.
2. **Whenever possible, we rely on automated reporting and tabulation.** This allows us to go from data validation to reports quickly and efficiently, without errors caused by version control, manual data entry, or copy and paste errors.
3. **We understand the reporting requirements to conform to the California Load Impact protocols.** Because of our background, we don't anticipate surprises in the format, content, or timeline of the key project deliverables, which means that utilities will get the right information at the right time in a clear, accessible format.

3.1 DATA CHECKS

The first step for quality control is to make sure that all data that had been requested is both accounted for and does not contain spurious values. To that end, we have implemented a detailed checklist for our demand response evaluations that investigates common data pitfalls for each type of data typically used in a demand response evaluation. A summary of these questions typically includes:

1. **Interval Data:** Is the data in the right units? Adjusted for Daylight Savings and any grid export/net demand? Is there a full panel of data for all customers? Are there outliers in terms of customer size? Did we receive all the interval data for the customers we requested?
2. **Customer Characteristics:** Do we have all the relevant participant and control groups? Do we have DR enrollment data for all customers and were they affected by other interventions during the analysis period? Do we have all the characteristics that are needed for reporting?
3. **Treatment and Event Data:** Do we have the correct event days identified? Are the event days and hours properly coded? Can we visually see when customers are reducing loads during events?
4. **Weather Data:** Is the DST adjustment in the weather data consistent with that of the interval and event data? Is it in the right time zone and units?

Because incorrect data will lead to incorrect results, any issues that are identified to be significant to the evaluation will be addressed with SDG&E's team to ensure quick resolution.

3.2 ANALYSIS CHECKS

Analysis checks are critical to a successful evaluation, and where our expertise in DR evaluations will provide value. Because of our familiarity with these demand response programs and the California load impact protocols, we are able to quickly identify results that do not make sense and either correct the issue or identify the reason why results differ from our initial assumption. While analysis checks tend to be program specific, the general considerations are:

1. **Analysis Dataset Construction:** Is the control group constructed appropriately? Is it statistically indistinguishable from the treatment group on days when no customer was dispatched? What are the results of out of sample testing? Given model precision and bias, will we be able to detect the expected effect?
2. **Ex post results:** Are the results generally in line with prior years, given no substantial program changes? Are all customers dispatched as expected? Do weather sensitive programs see greater impacts on hotter days? Do reference load patterns follow the same trend as the raw data with regards to temperature? What are the distributions of impacts - are there large customers that are driving the majority of impacts? Are there particular customer segments that respond differently?
3. **Ex ante results:** Given the differences between ex post and ex ante weather and participation, do reference loads look appropriate for each day type and weather year? What about percent impacts? Have we captured the effects of dual enrollment for program and portfolio impacts appropriately? Have changes to program design or enrollment been captured in the ex ante forecasts?

The focus of these questions is to ensure that there are no surprises in the evaluation report and that all results are situated in their full context. In collaboration with SDG&E's team, we will work to frequently share draft findings and raise any issues as they arise.

3.3 REPORTING CHECKS

Many iterations are expected in the process of producing draft and final evaluation reports, load impact tables, and other results memos. In those cases, opportunities arise for omissions, copy/paste errors, and gaps in reporting updates. To the extent possible, the evaluation team relies on automated reporting and table generation, where the latest version of the analysis is automatically written into a report. This ensures that reports and load impact tables are consistent in their results, and that all values are updated whenever an updated version of the analysis is implemented.

3.4 PROJECT MANAGEMENT CHECKS

As discussed in the kickoff meeting, Alana Lemarchand will be the key contact for all project management topics. They will both be responsible for ensuring that the project remains on time and on budget and will identify bottlenecks or issues likely to affect the project timeline as soon as possible to the Statewide CPP team. As part of this process, monthly reporting on budget, key tasks completed, upcoming deliverables, and any changes to the schedule will be provided to the Statewide CPP team.

4 DATA NEEDED

Demand Side Analytics is delivering initial data requests along with the draft version of this evaluation plan. At a high level, the data requests include nine items:

1. Customer characteristics file for participants
2. Hourly interval data for participants
3. Outage data (included in ELRP data requests for PY 2025)
4. Weather data (included in ELRP data requests for PY 2025)
5. Dual program enrollments
6. Event notifications

5 TIMELINE

Table 4 below shows the next steps for the evaluation of the Statewide CPP programs:

Table 4: Timeline of Key Deliverables

Task	Deliverables	Timing
1 Project Management	Regular Meetings	October 2025-March 2025
	Kick-Off Meeting	9/16/2025
	Kick-Off Memo	9/23/2025
2 Evaluation Plan	Draft Evaluation Plan	10 business days after kick-off meeting: 9/30/25
	Final Evaluation Plan	5 business days after comments received; SDG&E to submit to CPUC by December
3 Data Collection and Validation	Data Request	9/30/2025 Secondary request for AMI data for potential control pool to follow
4 Ex-Post Results	Draft and Final Result Spreadsheets	n/a
5 Ex-Ante Results	Draft and Final Result Spreadsheets	Draft TTMs: 1/15/2026 Present draft results: 1/25/2026 Comments on draft load impacts: 2/5/2026 Draft ex ante table generators: 2/10/2026 Final ex ante table generators: 2/28/2026
6 Documentation & Reporting	Draft Evaluation Report	2/10/2026
	Final Evaluation Report	2/28/2026
	Executive Summary	3/10/2026
	CALMAC Abstract	3/10/2026
7 Presentation of Results	Internal Presentations	April 2026
	DRMEC Workshop	May 2026
8 Database Documentation	Produce database files	3/1/2026