Program Overview

Program Budget and Savings

1. **Program Name**
   SDG&E's Summer Reliability Market Access Program (SRMAP)

2. **Program ID number**
   SDGESRMAP

3. **Program Budget Table**

Cost Category	2022	2023	Total
Administration	$570,000	$1,710,000	**$2,280,000**
Marketing/Outreach	$342,000	$1,026,000	**$1,368,000**
Direct Implementation – Non-Incentive	$1,139,750	$3,419,250	**$4,559,000**
Direct Implementation – Incentive	$3,648,250	$10,944,750	**$14,593,000**
Total	**$5,700,000**	**$17,100,000**	**$22,800,000**

4. **Program Impacts Table**

SRMAP Goals	2022	2023	Total
Gross Electric Savings (kWh)	7,296,296	21,888,887	**29,185,183**
Net Electric Savings (kWh)	6,156,621	18,469,863	**24,626,484**
Gross Gas Savings (therms)	n/a	n/a	**n/a**
Net Gas Savings (therms)	n/a	n/a	**n/a**

Summer Reliability Market Access Program (SRMAP) Demand Reduction Goals

SRMAP Goals	2022	2023
Peak Savings (net kW)	1,600	5,000
Net Peak Savings (net kW)	1,100	3,200

5. **Program Cost Effectiveness (TRC)**

Program Year	TRC
2022	0.91
2023	0.91

6. **Program Cost Effectiveness (PAC)**

Program Year	PAC
2022	1.05
2023	1.05

7. **Type of Program Implementer**
   PA-Delivered

8. **Market Sector(s)**
   Residential, Commercial, Industrial, Agricultural, and Public

9. **Program Type**
   Summer Reliability

10. **Market channel(s) and Intervention Strategies, campaign goals, and timeline.**
    Market Channel: Downstream

    Intervention Strategies: Incentive, Direct Install, Technical Assistance

    Campaign Goals: Emergency peak demand and/or net peak demand reductions

    Timeline: Summer 2022-2023

Implementation Plan Narrative

1. **Program Description**

The Summer Reliability Market Access Program offers aggregators the opportunity to provide SDG&E customers a wide variety of options not available through conventional Energy Efficiency programs to reduce energy usage. The program utilizes population-level NMEC rules and methodologies to determine verified energy savings. A pay-for-performance (PFP) payment structure incentivizes aggregators to identify energy efficiency projects that deliver measurable peak (4pm-9pm) or net peak (7pm-9pm) demand savings, notably during summer months.

The Summer Reliability Market Access Program was designed in response to Governor Newsome's Emergency Proclamation of July 2021 to expedite clean energy projects and relieve demand on the electrical grid during extreme weather events and California Public Utility Commission's (CPUC) Decision 21-12-011. Program incentives are tiered for demand savings delivered during summer months (June-September) for peak (4pm-9pm) and net peak (7pm-9pm) hours to drive participation and outcomes for this effort.

The primary program objective is to produce emergency peak demand and/or net peak demand reductions through energy efficiency actions. Specific objectives include:

- Open access to qualified aggregators to facilitate wider contractor and customer participation.
- Provide incentives aligned with the value to the grid.
- Provide technical assistance to customers to achieve energy savings.
- Utilize NMEC methodologies to pay aggregators based on delivered savings, thus expanding the measures available for implementation.

2. Program Delivery and Customer Services

The program will be open to participation for SDG&E customers from all market sectors, with exception of industrial projects not permitted by the NMEC Rulebook (revised January 2020). The program will enroll any aggregator that meets the requirements listed in the program participation agreement. This open market will allow a wide range of solutions to identify energy efficiency projects that deliver measurable peak or net peak demand savings. Incentives offered will be most valuable during summer peak and net peak hours. Any measure which is incremental to the existing EE portfolio will be allowed as long as savings are measurable at the meter using the program's NMEC approach. Population-level NMEC rules will be used to verify savings, and a pay for performance payment structure based on those verified savings will be used to incentivize participation. Targeted marketing will be used to notify aggregators of the program offerings and benefits. Information about the program will be provided through outreach events. Aggregators will offer technical assistance to customers by identifying projects which result in maximum demand reduction.

3. Program Design and Best Practices

The strategies and tactics that will be used to reduce the identified market barriers are as follows:

- **Program Complexities**: To address the program complexities faced by customers striving to save energy, the program will incentivize aggregators who will offer technical assistance to identify measures and support customers through installation of these measures. Marketing and outreach will be offered

at both the utility and aggregator level to increase awareness about the program and its benefits. The open market nature of the program will lead to a simplified participation process.

- **Measure Eligibility Constraints**: The population level NMEC component of the program will offer measure eligibility not available through other channels. This will allow customers to capture energy savings otherwise stranded.
- **Lack of Capital**: The program will offer a partial upfront incentive to help with project implementation for qualifying measures. Although eligibility has not yet been determined, there is also the potential for financial assistance through utility or state financing programs. The program offers financial benefits for Energy Efficiency savings not available otherwise.
- **Supply Constraints**: To assist with an expected shortfall of capacity, the program offers increased incentives for summer peak and net-peak reductions. These incentives are designed to encourage identification of measures targeting the desired reductions and deliver emergency demand reductions in Summer 2022 and 2023.

4. **Innovation**

   D.21-12-011 provides clear direction to IOUs to deliver peak and/or net peak demand savings using the normalized metered energy consumption method of measuring energy and peak demand savings in residential and non-residential buildings beginning in summer of 2022. Although Innovation remains a key objective, for purposes of this program SDG&E is targeting Commission objectives as outlined in the Decision.

5. **Metrics**

   This program will track two types of metrics. Performance Metrics and Indicator Metrics. The first type is the primary means of measuring program success. The second type are indicators that will be tracked and reported but are considered to be of secondary importance.

   The Primary Performance Metrics are:

   - Peak demand savings (kW);
   - Net Peak demand savings (kW)

   The following Indicators may be used to track program progress as jointly determined by the Energy Division and the IOUs:

- Program savings to date (kWh);
- Forecasted program savings (kWh);
- Forecasted peak demand and net peak demand savings (kW);
- Program TSB to date ($);
- Forecasted program TSB ($);
- Payments to Aggregator to date;
- Forecasted Payments to Aggregator;
- Total budget reserved;
- Forecasted number of completed projects;
- Number of approved projects per month;
- Total number of approved projects to date;
- Number of installed projects per month;
- Total number of installed projects to date.

6. For Programs claiming to-code savings

As directed by Decision D.21-12-011, this program is a population-level NMEC program. As such, all savings will be demonstrated against an existing conditions baseline including to-code savings.

7. Pilots

Pilots are not part of the program.

8. Workforce Education and Training

This program does not have a Workforce Education and Training component.

9. Workforce Standards[1]

9.1 HVAC Measures

Aggregators participating in the program will adhere to all requirements for workforce standards established by the Commission[2]. As part of the program participation agreement process, aggregators will affirm qualifications and licensure to perform the proposed work.

[1] D.18-10-008, Ordering Paragraph 1-2 and Attachment B, Section A-B, page B-1.
[2] D.18-10-008

9.2 Advanced Lighting Control Measures

Aggregators participating in the program will adhere to all requirements for workforce standards established by the Commission[3]. As part of the program participation agreement process, aggregators will affirm qualifications and licensure to perform the proposed work.

10. Disadvantaged Worker Plan

This program does not have a specific Disadvantaged Worker Plan; however, a key component of the program design is to not prescribe the methods of reducing load, thus enabling disadvantaged workers to have an equal opportunity to participate in the program.

11. Additional information

Not applicable. There is no additional information required by Decision D.21-12-011.

Supporting Documents

The following supporting documents are attached to the Implementation Plan:

1. **Program Manual and Program Rules**
2. **Program Theory and Program Logic Model**
3. **Process Flow Chart**
4. **Incentive Tables, Workpapers, Software Tools**
5. **Quantitative Program Targets**
6. **Diagram of Program**
7. **Evaluation, Measurement & Verification (EM&V)**
8. **M&V Plan**

[3] D.18-10-008

Attachment 1: Program Manual

SDG&E
Summer Reliability Market Access Program
Program Manual

Version 1.0

Table of Contents

1.0 INTRODUCTION

The Summer Reliability Market Access Program offers aggregators the opportunity to provide SDG&E customers a wide variety of options to reduce energy usage which are not available through conventional Energy Efficiency programs. The program utilizes population-level NMEC rules and methodologies to determine energy savings. A pay-for-performance (PFP) payment structure incentivizes aggregators to find energy efficiency projects that deliver measurable peak (4pm-9pm) or net peak (7pm-9pm) demand savings, notably during summer months (June 1st-September 30th).

The Summer Reliability Market Access Program was designed in response to Governor Newsome's Emergency Proclamation of July 2021 to expedite clean energy projects and relieve demand on the electrical grid during extreme weather events and California Public Utility Commission's (CPUC) Decision 21-12-011. Program incentives are tiered for demand savings delivered during summer months (June-September) for peak (4pm-9pm) and net peak (7pm-9pm) hours to drive participation and outcomes for this effort.

The primary program objective is to produce emergency peak demand and/or net peak demand reductions through energy efficiency actions. Specific objectives include:

- Open access to qualified aggregators to facilitate wider contractor and customer participation.
- Provide incentives aligned with the value to the grid.
- Provide technical assistance to customers to achieve energy savings.
- Utilize NMEC methodologies to pay aggregators based on delivered savings, thus expanding the measures available for implementation.

2.0 ELIGIBILITY REQUIREMENTS

2.1 Measure Eligibility

The underlying program design is to not prescribe what measures are used to reduce load; however, allowable measures must be incremental to those offered by SDG&E's Energy Efficiency portfolio. Allowable measures can be grouped into two categories:

- Measures that are NOT offered by any program within SDG&E's EE portfolio
- Measures that ARE offered by one or more programs within SDG&E's EE portfolio, but the savings being captured by the population based net metering methodology would not be allowed by SDG&E's EE portfolio's programs. (e.g. to-code savings)

Measures will be verified as part of project eligibility process prior to aggregators receiving a notice to proceed.

2.2 Project Eligibility

General project eligibility requirements include but are not limited to:

- Project site must be in SDG&E's service territory.
- Must have an active SDG&E electric account.
- Must pay the Public Purpose Program surcharge on the account where the energy efficiency (EE) equipment is to be installed.
- 12 consecutive months of energy usage data is available.
- More than one CPUC ratepayer-funded energy efficiency incentive or rebate program is not covering the same cost of a measure.
- If customer has an existing onsite solar or storage system, installation of the system must have been completed at least 12 months prior to the EE intervention.
- The eligibility of projects with new onsite solar or storage systems is being considered. Updates regarding the eligibility of these projects will be provided on the SRMAP website at sdge.com/SR-MAP.
- Customer may not be enrolled in a wholesale Demand Response program under Rule 32.
- The expected project load reduction does not exceed 1 MW.
- Projects must comply with the NMEC Rulebook for permissible projects.
- Projects must be installed no later than August 1, 2023.
- Other requirements as noted in the program M&V plan.

2.3 Aggregator Eligibility

Individuals or organizations that meet the requirements as listed in the Aggregator Participation Agreement may participate in the program. Aggregators are participating vendors or program partners who generate energy efficiency and/or demand savings for an aggregated group of customers. Aggregator must hold licenses for all work performed and comply with all applicable laws and permitting requirements.

3.0 AGGREGATOR ROLES AND RESPONSIBILITIES

Aggregators manage interactions and relationships with the customer in the program design. The following roles and responsibilities include:

- Knowledge of measures offered by SDG&E's other Energy Efficiency programs to ensure incrementality.

- Holds any agreement (e.g., Incentive, Direct Install, etc.) with the customer.
- Receives incentive payments and determines customer incentives if any.
- Responsible for performance.
- Agrees to SDG&E's terms and conditions of the Aggregator Participation Agreement.
- Agrees to terms of M&V Plan requirements.
- Accountable for resolution of customer complaints.
- Responsible for installation, warranties, and product guarantees if any.

4.0 ADDITIONAL SERVICES

The program may offer the following additional tools and services to SDG&E's customers:

- Referrals to financing assistance programs if available.
- Energy savings via methods that may include direct installation of EE measures, behavioral and operational changes, or other means to reduce metered energy use.
- Referrals to other energy efficiency and demand response programs. Participation in programs additional to SRMAP must occur such that the timing and scope of changes made are sufficiently documented to be detected and differentiated by the program's population level NMEC analysis methods.
- Customized outreach and technical assistance by aggregators to identify measures which help customers achieve summer peak and net peak reductions.
- Open network of aggregators.

5.0 AUDITS

Audits are not an element of the program except as an Aggregator may use them to identify potential measures. No audit report is required as part of the program.

6.0 INCENTIVE PAYMENTS

Incentives offered by the program vary by month and are tiered based on the following incentive periods.

Incentive Period	Hours
1. Net Peak	7:00-9:00 p.m.
2. Peak	4:00-7:00 p.m.
3. Off Peak	9:00 p.m.- 4:00 p.m.

The methodology to calculate these different incentive values is based on Hourly Levelized Values of Electricity from the Avoided Cost Calculator (ACC) for Distributed Energy Resources (DER) prepared by Energy and Environmental Economics, Inc. (E3)[1]. Shifting consumption from periods with higher levelized values (e.g. peak periods) to periods with lower levelized value, or reducing consumption, creates system benefits. Incentives rates are structured to take this into account, higher rates will be paid during Summer Net Peak and Summer Peak Hours.

The specific monthly incentive rates for each of the Incentive Periods will be provided on the SGD&E Summer Reliability Market Access Program website at sdge.com/SR-MAP.

Aggregators will receive incentive payments based on a Pay-for-Performance payment structure for delivered savings calculated by population based NMEC methodologies. These payments will occur at six different milestones.

Payment	Timing
Installation	After Project Completion
Q1	After end of next calendar year quarter after date of Installation
Q2	After end of 2nd calendar year quarter
Q3	After end of 3rd calendar year quarter
Q4	After end of 4th calendar year quarter
Final	After final calendar year quarter to complete 12-month evaluation

Installation Payment

The Installation Payment is intended to provide Aggregators with an initial payment to help cover project costs. Payments will be made as follows:

- Payment will be 40% of the Initial Expected Total Project Incentive Payment, but not more than 50% of the Project Cost.
- Payment will be made after Aggregator has confirmed project completion and SDG&E has validated installation documentation.
- Installation Payments will be made only for projects that install measures/equipment. Initial Expected Total Project Incentive Payment will be calculated based on the Aggregator reported baseline conditions and measures installed and the appropriate load curves and a weighted EUL.
- Project Cost will be the total Aggregator reported equipment and fully-loaded labor costs supported by appropriate invoices. Unusually high labor rates will be rejected.

[1] https://www.ethree.com/public_proceedings/energy-efficiency-calculator/
"2021 ACC Electric model v1b"

- An aggregated payment for Initial Payments will be processed once a month for each Aggregator.
- An adjustment to the 40% value may be made if an Aggregator's actual savings performance is consistently lower than initially estimated or if a given project's Expected Total Project Incentive cannot be reasonably estimated.
- Projects (or aggregations of projects) with a weighted EUL of less than 2 years will not receive an Initial Payment.

Quarterly Payments

The Quarterly Payments are meant to provide Aggregators with an ongoing revenue stream based on actual project performance (savings). Payments will be made as follows:

- The first quarterly payment (Q1) will be the difference between the Cumulative Earned Incentive in the first quarterly measurement period and the Installation payment.
- Each additional Quarterly Payment will be the difference between the Cumulative Earned Incentive and the actual prior payments. Note that no quarterly payment will be made until the balance of the Installation payment has been reached.
- Cumulative Earned Incentive is calculated based on the actual savings achieved to date multiplied by the appropriate incentive rates and EUL(s). Quarterly Payments are planned to be made within 60 days of the end of each calendar year quarter.
- While reporting will be available by project, an Aggregator will receive only one aggregated incentive payment per calendar quarter.
- A true-up is built into the design of the Quarterly Payments in that the actual payment amount is the to-date earned incentive amount, based on metered savings, minus the actual incentive payments made to-date.

Final Payment

The Final Payment is the last quarterly payment based on actual project performance (savings). Payments will be made as follows:

- The Final Payment will be the difference between the Total Project Incentive Payment for an M&V period of 12 months and the actual prior payments.
- Total Project Incentive Payment will be calculated using the actual savings achieved during the prior 12-month M&V period for all of the five Incentive Periods and a weighted EUL.
- The Final Payment quarter will include the last weeks or months needed to reach an M&V period of 12 months.

- The Final Payment will be made within 60 days of the end of the last calendar quarter.
- If the final Aggregator payment for energy savings results in a dollar amount that is less than the sum of any aggregator payments previously issued, the aggregator will have to refund the difference.

Incentive Limit

For all projects with an Effective Useful Life (EUL) of greater than 1 year, the total of all incentive payments for a project will be limited to the Project Cost of that project. For purposes of this limit, Project Cost will be determined by the total project cost, prior to customer incentives provided by the Aggregator to the customer and listed on the invoice as "SDG&E Summer Reliability Market Access Program Incentive" and supported by material invoices and fully-loaded labor rates. All cost documentation is subject to SDG&E review and approval.

7.0 QUALITY ASSURANCE

7.1 Quality Assurance Plan

To ensure program success and customer satisfaction, the Summer Reliability Market Access Program will adhere to the following quality assurance guidelines.

- Review of aggregator qualifications to meet program eligibility rules.
- Early screening of customer and project details.
- Required submittal of project documentation to verify installation for each project and comparison to planned project.
- Review of project documents to meet program eligibility and support project calculations.
- Inspections of completed projects per the conditions noted in the Inspection section below.

7.2 Inspections

SDG&E reserves the right to select any project for inspection. Project selection may consider the following:

- Low savings realization rates
- Unique technology
- Projects with large Incentive amounts
- Projects with long EULs

By participating in the program, aggregators and customers are agreeing to allow all inspections required by the program. Inspections may be onsite or virtual. The decision to use virtual or in

person inspection approach will be determined on a case-by-case basis at the sole discretion of the program staff. An inspection report will be created and made available to aggregators.

8.0 PROGRAM METRICS

This program will track two types of metrics. Performance Metrics and Indicator Metrics. The first type is the primary means of measuring program success. The second type are indicators that will be tracked and reported but are considered to be of secondary importance.

The Primary Performance Metrics are:

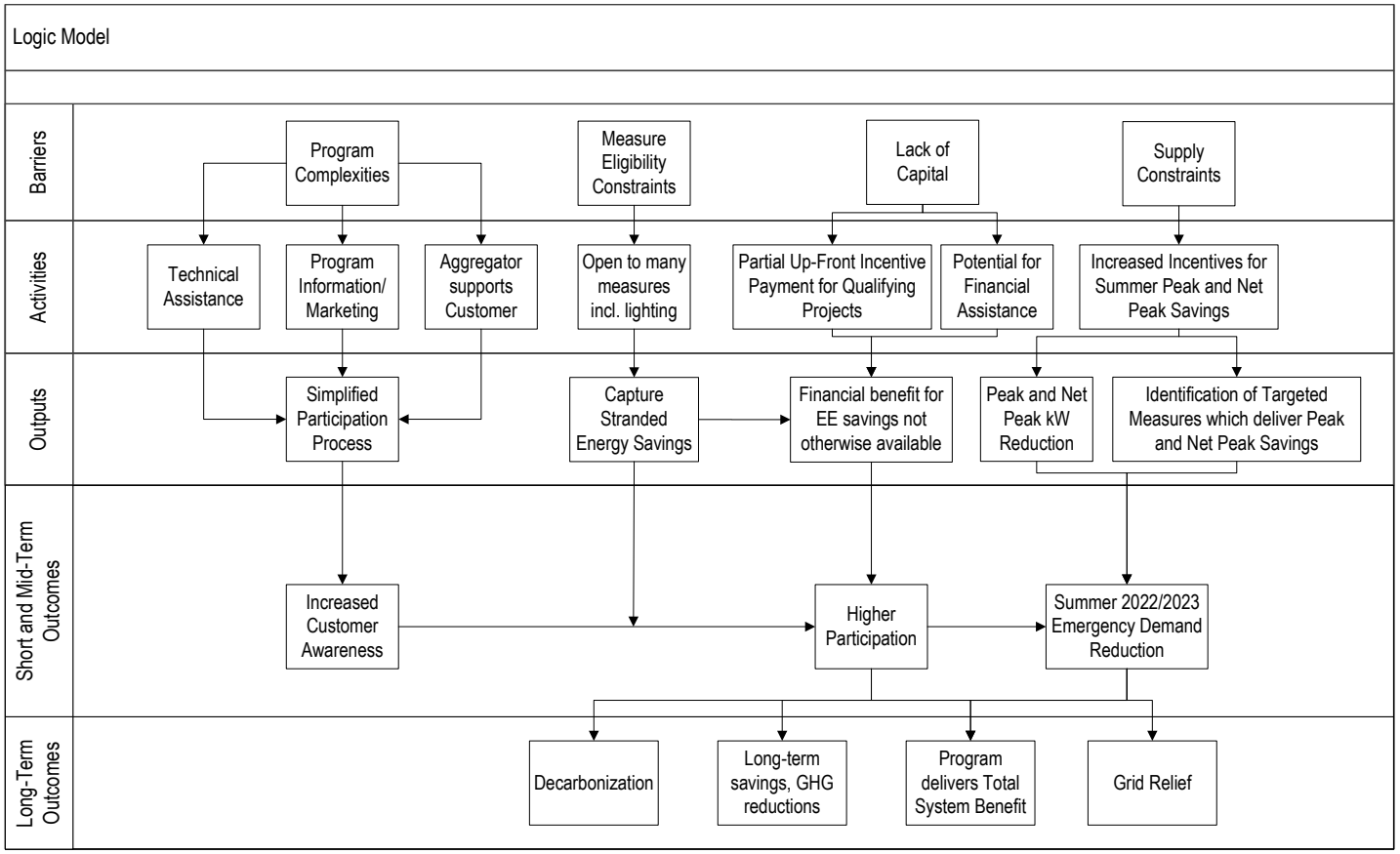
- Peak demand savings (kW);
- Net Peak demand savings (kW).

The following Indicators may be used to track program progress as jointly determined by the Energy Division and the IOUs:

- Program savings to date (kWh);
- Forecasted program savings (kWh);
- Forecasted peak demand and net peak demand savings (kW);
- Program TSB to date ($);
- Forecasted program TSB ($);
- Payments to Aggregator to date;
- Forecasted Payments to Aggregator;
- Total budget reserved;
- Forecasted number of completed projects;
- Number of approved projects per month;
- Total number of approved projects to date;
- Number of installed projects per month;
- Total number of installed projects to date.

Attachment 2: Program Theory and Program Logic Model

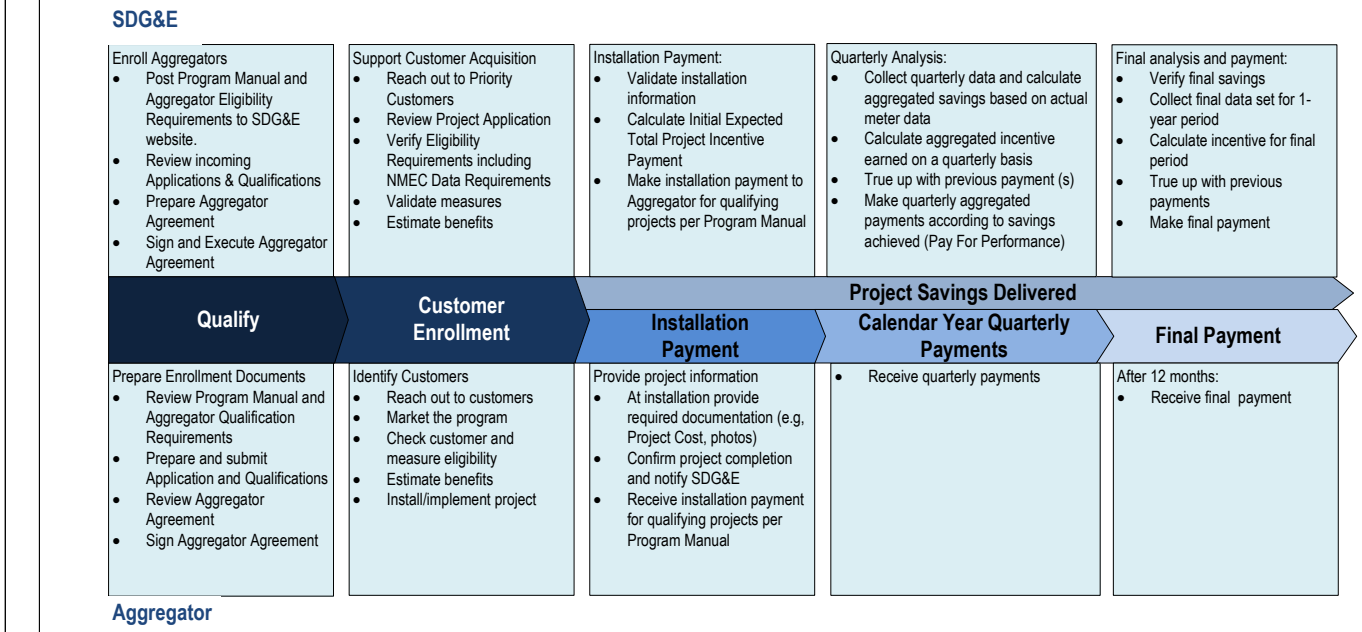
Summer Reliability Market Access Program



Attachment 3: Process Flow

Summer Reliability Market Access Program

Process Flow Chart



Attachment 4: Measures and Incentives

The underlying program design is to not prescribe what measures are used to reduce load; however, allowable measures must be incremental to those offered by SDG&E's Energy Efficiency portfolio. Allowable measures can be grouped into two categories:

- Measures that are NOT offered by any program within SDG&E's EE portfolio
- Measures that ARE offered by one or more programs within SDG&E's EE portfolio, but the savings being captured by the population based net metering methodology would not be allowed by SDG&E's EE portfolio's programs. (e.g., to-code savings)

Measures will be verified as part of project eligibility process prior to aggregators receiving a notice to proceed.

Incentives are tiered based on Hourly Levelized Values of Electricity from the Avoided Cost Calculator (ACC). Shifting consumption from periods with higher levelized values (e.g., peak periods) to periods with lower levelized value, or reducing consumption, creates system benefits. Incentives rates are structured to take this into account, higher rates will be paid during Summer Net Peak and Summer Peak Hours.

The specific incentive rates for each of the Incentive Periods will be published on the SDG&E Summer Reliability Market Access Program website at sdge.com/SR-MAP.

Attachment 5: Quantitative Program Targets

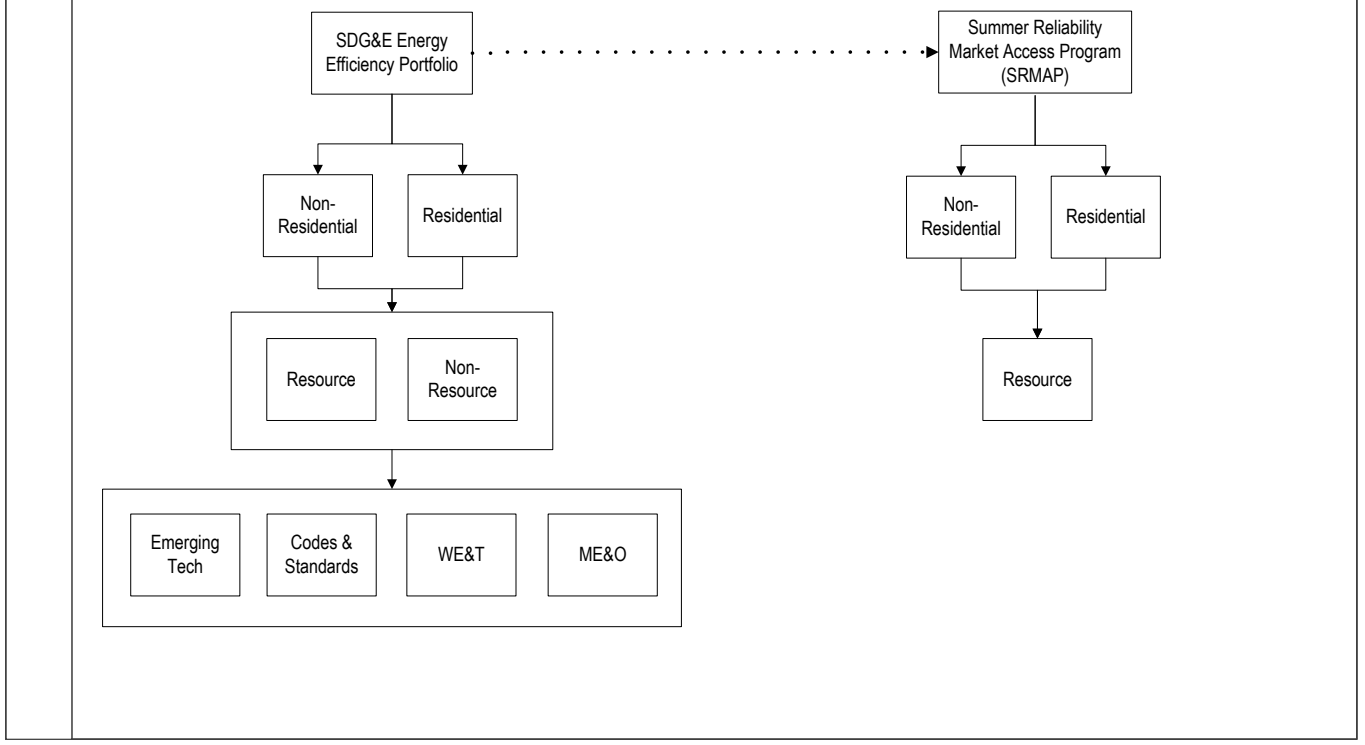
The Summer Reliability Market Access Program will deliver savings starting in the summer of 2022 and continuing through 2023.

Target	**2022**	**2023**	**Total**
Savings (net kWh)	6,156,621	18,469,863	24,626,484
Peak Reduction (net kW)	1,600	5,000	
Net Peak Reduction (net kW)	1,100	3,200	
Incentives paid to Aggregators	$3,648,250	$10,944,750	$14,593,000

Attachment 6: Diagram of Program

Summer Reliability Market Access Program

Diagram of Program



Attachment 7: Evaluation, Measurement & Verification (EM&V)

EM&V process evaluation is not planned for SRMAP at this time. The program M&V Plan (Attachment 7) discusses the detailed M&V strategy employed.

Attachment 8: M&V Plan

San Diego Gas & Electric

Measurement & Verification Plan

Summer Reliability Market Access Program (SRMAP)

for Non-Residential and Residential Customers

First Upload Date: May 27, 2022

Table of Contents

1. Introduction

a. Background

On July 30, 2021, Governor Newsom signed an emergency proclamation to "free up energy supply to meet demand during extreme heat events and wildfires that are becoming more intense and to expedite deployment of clean energy resources this year and next year." In the Governor's July 30, 2021 Emergency Proclamation, all energy agencies, including the California Public Utilities Commission, were directed to act immediately to achieve energy stability during this emergency.

In response to the Governor's Emergency Proclamation, on August 6, 2021, the assigned Administrative Law Judge (ALJ) sent an e-mail ruling to parties in R.13-11-005, seeking input on actions that the Commission could take, specific to energy efficiency (EE) and reliability, to help support the Governor's Proclamation and the Commission's overall goals. After receiving comments on the ruling from the parties, on December 8, 2021, the Commission issued the Decision, which orders the IOUs to take actions to prepare for potential extreme weather in the summers of 2022 and 2023.

On February 7, 2022 San Diego Gas & Electric Company (SDG&E) submitted Advice Letter 3951-E for SDG&E's Market Access Program to the California Public Utilities Commission (Commission or CPUC). The Advice Letter received CPUC approval on March 24, 2022.

b. Program Description

The Decision authorizes a two-year Market Access Program (MAP), that is being funded by $150 million allocated among Pacific Gas and Electric Company (PG&E), Southern California Edison (SCE), and SDG&E, to deliver peak and/or net peak demand savings using the normalized metered energy consumption (NMEC) method of measuring energy and peak demand savings in residential and commercial buildings.

The Summer Reliability Market Access Program offers aggregators the opportunity to provide SDG&E customers a wide variety of options not available through conventional Energy Efficiency programs to reduce energy usage. The program utilizes population-level NMEC rules and methodologies to determine energy savings. A pay-for-performance (PFP) payment structure incentivizes aggregators to find energy efficiency projects that deliver measurable peak (4pm-9pm) or net peak (7pm-9pm) demand savings, notably during summer months.

The primary program objective is to produce emergency peak demand and/or net peak demand reductions through energy efficiency actions. Specific objectives include:

- Open access to qualified aggregators to facilitate wider contractor and customer participation.
- Provide incentives aligned with the value to the grid.
- Provide technical assistance to customers to achieve energy savings.
- Utilize NMEC methodologies to pay aggregators based on delivered savings, thus expanding the measures available for implementation.

Incentives will be distributed in two stages. The Installation incentive, which is estimated to represent approximately 40% of the total incentive, but limited to 50% of project cost, will be awarded shortly after project completion based on ex-ante projections of energy savings, load shape, and effective useful life

(EUL). The second stage incentive is the pay-for-performance component and will be determined via ex-post savings measured at the meter. Payments for this second stage incentive do not begin until the performance component exceeds the value of the Installation incentive payment made.

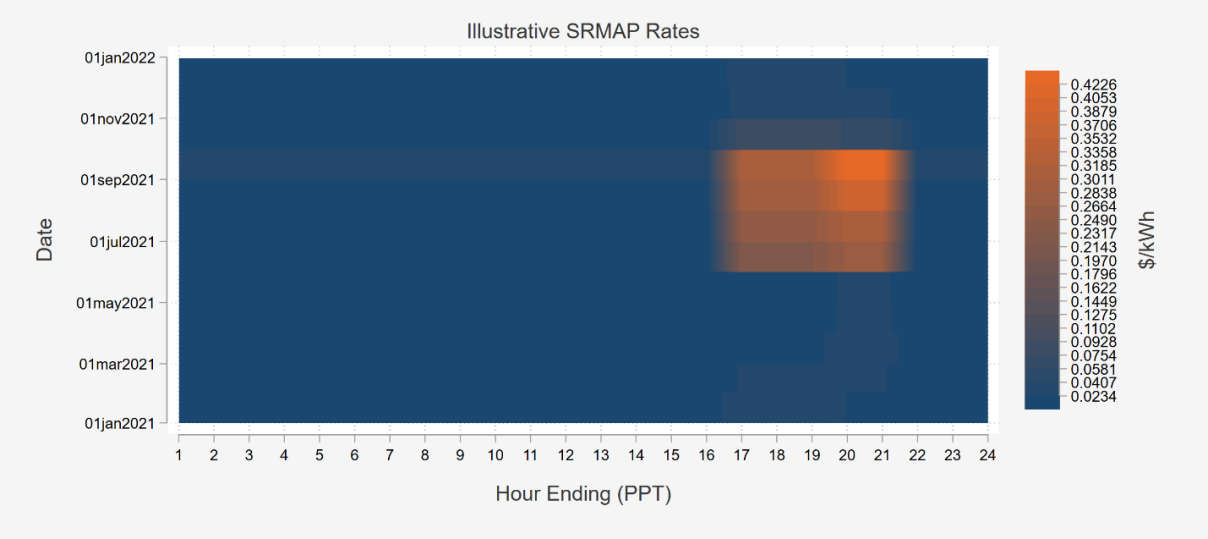
This measurement and verification (M&V) plan provides technical details regarding the estimates of energy savings that underpin both sets of incentives. It is important to recognize that the NMEC procedures used to settle with aggregators are the same procedures SDG&E will use to report program performance. The program-level achievements are simply the sum of the performance estimates across each calendar quarter for each aggregator.

The primary objective of the Summer Reliability Markey Access Program (SRMAP) is to deliver peak and net peak demand savings during the summers of 2022 and 2023. To clearly signal this goal to the market, SDG&E will use higher incentive levels to incentivize projects and measures that bring peak and net peak reductions for the summers of 2022-2023 and beyond. SDG&E classifies individual hours across the year into three separate categories: Peak, Net Peak, and Off-Peak hours.

- **Peak hours**: hours between 4-9 P.M.
- **Net Peak hours**: hours between 7-9 P.M.
- **Off-Peak hours**: All other hours will be considered Off-Peak

Figure 1 shows illustrative monthly SRMAP incentive rates for the three incentive periods, mapped to all hours of the year. The orange shaded portions show the periods that have the highest rates. Incentives during Peak and Net Peak hours during summer months can be as much as 20 times the rates of winter months. Off-Peak rates do not vary much throughout the year. The illustrative rates are based on avoided cost values in the CPUC's 2021 Avoided Cost Calculator.[1] Though there are six climate zones in SDG&E territory, pricing differences are negligible across the six SDG&E climate zones and zone 7 contains the majority of SDG&E population. As such, zone 7 was selected as representative of the entire SDG&E territory. The SRMAP program incentive structure reflects this price signal to the market.

Figure 1: 8760 SRMAP Rates for Year 2021



[1] https://www.ethree.com/public_proceedings/energy-efficiency-calculator/

c. Summary of Key M&V Plan Elements

Table 1: M&V Plan Overview

M&V Consideration	Planned Approach
Settlement Population Definition (Calendar Quarter)	All projects for a given aggregator with fewer than 365 days (one year) of saving accrued during a given calendar quarter.
Analytical Method	Individual premise regression with synthetic control profiles[2] as an independent variable. The model used is a seasonal Time of Week Temperature (TOWT) model that includes 168 hour-of-week dummy variables, a temperature spline, and one or more granular profiles which act as a synthetic control. The profiles will be based on a segmentation scheme that is still being finalized. Preliminary segments are described under Ex-Post NMEC Methods.
Contractor	SDG&E has retained the Mendota Group and Demand Side Analytics to develop and implement this M&V plan and build out the settlement platform
Calculation Software	Stata 16.1
Data Collection Strategies	Upfront capture of typical efficiency attributes: • project location (contract number) • project start and completion date • equipment type, quantity, capacity, and specifications • project cost • Installation incentives Periodic capture of AMI data for participant and of AMI data and meta data for comparison group (for matching) Back-end consolidation of participant meter data, performance estimates, and incentive payments
Performance Metrics	Aggregate peak kW savings Aggregate net peak kW savings Annual kWh savings Weighted Average EUL Total System Benefits
Weather normalization	Settlement and reporting will be based on actual ex-post measurement of savings during the 2022-2023 observation period without weather normalization. Regression models developed using data from the baseline period will be used to predict population loads during the performance period.
Total System Benefits Calculation	Net Present Value of 2022-2033 ACC values for climate zone 7[3]and a discount rate of 7.55%[4] divided by 12 is used as TSB, calculated separately (1) per month and (2) by Net Peak, Peak and Off-Peak periods.

[2] Abadie, Alberto. 2021. "Using Synthetic Controls: Feasibility, Data Requirements, and Methodological Aspects." *Journal of Economic Literature*, 59 (2): 391-425.

[3] ACC pricing differences across the six SDG&E climate zones are negligible and zone 7 contains the majority of SDG&E population. As such zone 7 was selected as representative of the entire SDG&E territory

[4] SDG&E authorized Rate of Return

2. Savings Forecast and Installation Incentive

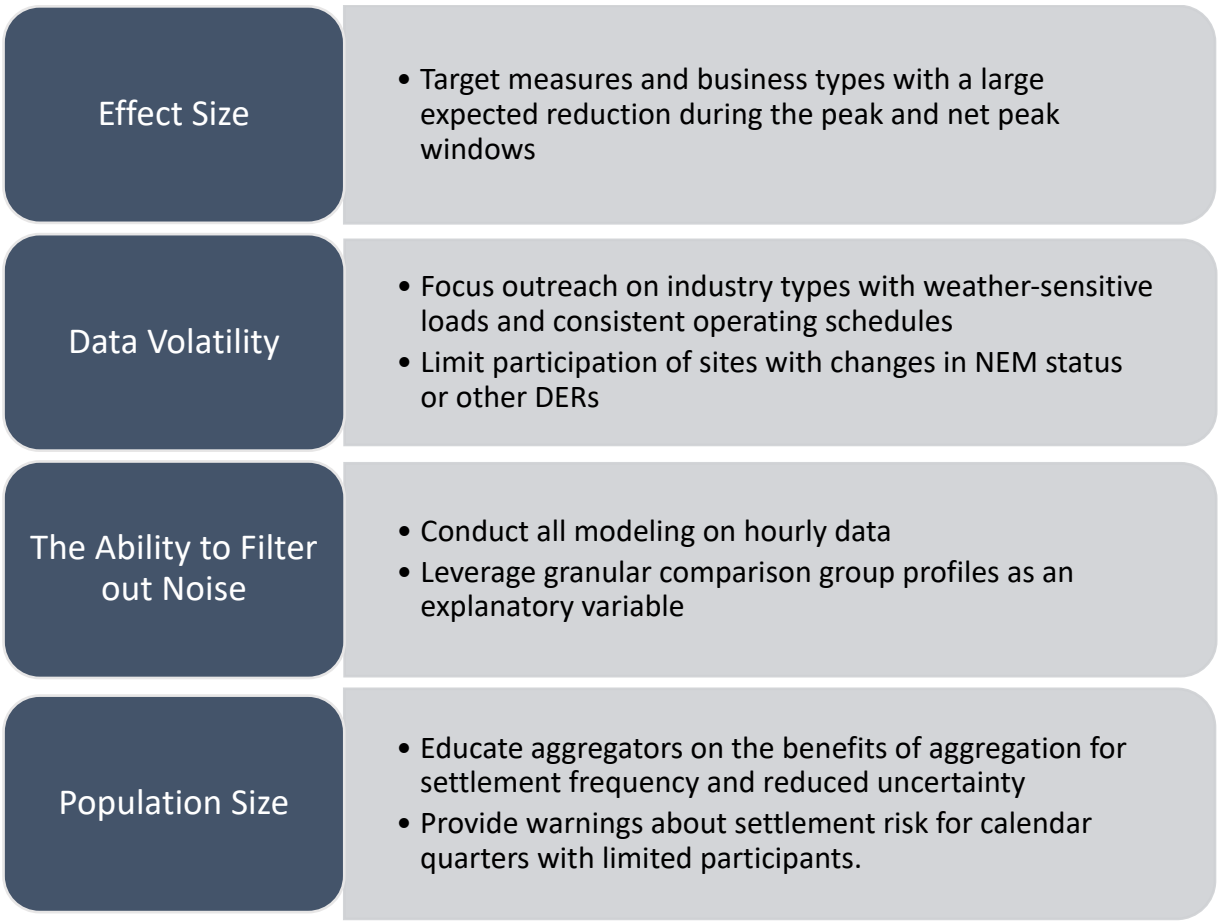
a. Suitability of NMEC Methods

SDG&E's design of SRMAP is a function of the CPUC's decision to approve a Market Access Program to enhance reliability during the summers of 2022 and 2023. The decision dictates that a population-level NMEC approach be used for settlement and reporting. Instead of examining an existing program design and determining if population-level NMEC methods are appropriate, we start knowing that SRMAP will be delivered via population-level NMEC methods and designed the program in a way that is well-suited to NMEC methods.

The ability to measure energy savings accurately using population NMEC methods depends on four key components:

1) **The effect or signal size** – The effect size is most easily understood as the percent change in energy use following the intervention. It is easier to detect large changes than it is to identify small ones.
2) **Inherent data volatility or background noise** – The more volatile the load, the more difficult it is to detect small changes. Non-routine events effectively add noise to the data.
3) **The ability to filter out noise or control for volatility** – Statistical models, baseline techniques, and comparison groups – no matter how simple or complex – are tools to reduce noise (or unexplained variation) and allow the effect or impact to be more easily detected.
4) **Sample/population size** – For most population-level NMEC programs, sample size and population size are the same because the full participant population is analyzed. It is easier to precisely estimate average impacts for a large population than for a small population because individual customer behavior patterns "smooth out" and offset individual customer volatility across large populations.

Figure 2: Program Design Elements to Increase NMEC Suitability



b. Eligibility and Permissible Measures and Projects

Summer Reliability Program is open to qualified **residential and non-residential** customers who receive SDG&E electricity distribution services and pay into the Public Purpose Program (**PPP**) surcharge. SRMAP is open to non-residential customers with projects meeting the following requirements to participate (interest from customers outside these parameters, can be reviewed on ad hoc basis):

- The customer must pay the Public Purpose Program (PPP) surcharge on the electric meter in which the energy-efficient equipment is being proposed.
- The energy efficiency project will reduce at least 3%[5] of the customer's metered annual electrical usage at the project site.[6]
- The customer provides pre- and post-installation metered energy use data through the SDG&E electric meter.

[5] See Effects Of Sample Size On Accuracy And Precision, page 66, https://pda.energydataweb.com/api/view/2587/PGE_NMEC_Accuracy_Assessment_Report_02-15-2022.pdf

[6] Projects with less than 10% must provide a rationale and explanation of how savings will be distinguished from normal variations in consumptions

- A minimum of 12 months of pre-treatment AMI meter data is available.
- The customer site does not use more than 1 MW of peak demand consumption.
- The project site does not have a change in on-site generation within the previous year. Specifically, the capacity of solar, thermal energy storage, or battery storage systems has not changed in 12 months and does not plan to change for the next 12 months.
- The customer must agree to provide all required documentation and access to the facility for project-related audits, inspection or data gathering by SDG&E or by the CPUC.

Residential customers should meet the following requirements:

- The residence must have its own service account.
- The energy efficiency project will reduce at least 3% of the customer's metered annual electrical usage at the project site.
- A minimum of 12 months of pre-treatment AMI meter data is available.
- The project site does not have a change in on-site generation within the previous year. Specifically, the capacity of solar, thermal energy storage, or battery storage systems has not changed in 12 months and does not plan to change for the next 12 months.
- The customer provides pre- and post-installation metered energy use data through the SDG&E electric meter.
- The customer must agree to provide all required documentation and access to the facility for project-related audits, inspection or data gathering by SDG&E or by the CPUC.

Qualifying Energy Efficiency Measures
The Summer Reliability Program accepts a wide variety of energy-saving projects for residential and non-residential sites. All measures must meet the following criteria:

1. Equipment retrofits, weatherization, and add-on equipment.
2. Behavioral, Retrocommissioning (RCx), or Operational measures.
3. Must Exceed Baseline Energy Performance by minimum 3% but ideally 10% or more[7].
4. Must be permanently installed.
5. Cannot Overlap with Other Incentive Programs.
6. Existing Equipment Must Be Decommissioned and Removed.

c. Estimated Savings

The project savings forecast calculations are essential to assess the viability of the project. They serve as an important guide to the metered data analysis and to ensure that the project's energy use is within acceptable tolerance levels towards the projected energy savings. At the project application stage, the package must provide a clear, detailed, all-inclusive, and defensible explanation of the energy savings and demand reduction calculation methodology that incorporates a weighted EUL methodology. Explain all assumptions and provide fully reviewable calculations. The methodology must meet current industry standards for accuracy and acceptability. Reference relevant DEER, EM&V, CPUC, and use pre-approved preferred program administrator calculation tools. Supporting attachments should be embedded or referenced in the Attachments and References sections. If any measures are taken directly from or created with READI, either embed the READI export or indicate the DEER Measure ID.

[7] Projects with savings below 10% will be alerted about the elevated payment risk given the small expected relative effect size

Load shapes are used for portfolio lifecycle cost analysis of a measure's energy savings over one year. A load shape is a set of fractions summing to unity, with one fraction per hour (or other time period). Multiplying a savings value by the load shape value for any particular hour yields the energy savings for that particular hour. If possible, use DEER load shapes, which are hourly. The ideal load shape for net benefits estimates would represent the difference between the base case and measure case.

d. Effective Useful Life

The weighted average EULs should comprise the best available estimate of the relative contribution of different measures to total savings, based on available data. SRMAP that is using a population-level approach should calculate a population-level weighted average EUL; EUL calculation must be based on ex ante EUL assumptions weighted by the ex ante savings. Aggregators should consult with SDG&E about the approach to calculating weighted average EUL and provide their calculations and the data used. Weighted average EUL example:

- Measure 1: 100,000 kWh savings, 10-year EUL
- Measure 2: 200,000 kWh savings, 3-year EUL

The EUL of the bundle would be (100,000 * 10 + 200,000 * 3) ÷ (100,000 + 200,000) = 5.33 years.

e. Incentive Calculation

The incentive payment amount is based on flat incentive rates applied to savings in each incentive period, for year one of savings. This amount is then multiplied by the weighted average EUL. The final incentive amount is based on the verified savings and may vary from the estimated amount used for the Installation payment.

Aggregator incentive payments will be tied to the project's peak kWh, net peak kWh, and off-peak energy savings as validated through metered data. The total amount of this performance-based incentive will ultimately depend on the kWh achieved, by costing period, as measured according to the approved M&V Plan.

- Approved SRMAP Population NMEC projects will qualify for a financial incentive. The kWh incentive rates by period, listed on the program website (sdge.com/SR-MAP), will be used to identify the potential incentive amount for the project.
- The Installation incentive payment amount will be calculated using the best available information to estimate the potential energy savings of the project when the Installation Report is approved. It will be 40% of the Initial Expected Total Project Incentive Payment, but not more than 50% of the Project Cost. [8]
- The subsequent incentive payment amounts will be based on actual performance across five calendar quarters based on the 12 months of post-installation metered energy savings analysis for the project. The first performance milestone will be based on the remaining calendar quarter days after installation, the next three payments on the subsequent full three calendar quarters, and the fifth performance milestone will be based on the remaining days in the last calendar quarter until

[8] An adjustment to the 40% value may be made if an Aggregator's actual savings performance is consistently lower than initially estimated.

one full year after installation. The total incentive payment amount may be subject to a limit of total project cost.

3. Ex-Post NMEC Methods

The performance component of SRMAP incentive payments and the performance claims for the program will be based on population-level NMEC methods, consistent with Version 2.0 of the Rulebook for Programs and Projects Based on Normalized Metered Energy Consumption. NMEC methods rely on a comparison of energy consumption at the revenue meter during the pre- and post-intervention period. Regression models with weather and time variables help to explain variability in energy consumption and isolate the effect of the intervention. The difference in the pre-post change in hourly energy consumption amongst the population of interest and a control group of non-participants is the output of interest.

a. [9]Settlement Calendar Quarter Definitions

For settlement purposes, a portfolio of projects will be defined as all projects that are still in their first year of savings (installed in the prior 365 days). The portfolio will be rolled up for each individual aggregator and settlements will be done on a calendar quarter basis. The projects need not come from the same sector, climate zone, or industry type because each participants' modeling will be done independently from one another.

SDG&E plans to communicate the risks associated with population NMEC procedures when savings or population size is small via a table like the conceptual example shown in Table . The table values represent the relative precision, or the expected margin of error divided by the effect size. This metric is referred to as Fractional Savings Uncertainty (FSU) in the NMEC rulebook. A cohort expected to save 5,000 MWh with a margin of error of ±3,000 MWh would have a margin of error of ±60% and a 95% confidence interval that the measured savings would fall between 2,000 MWh and 8,000 MWh. From an aggregator's perspective that means the performance payment amount can potentially vary from 40% to 160% of the actual value of the savings delivered due to measurement error. Values can be color coded to ensure correct interpretation:

- **Green** cells indicate limited settlement risk (error not more than half of the effect size),
- **Yellow** indicates moderate risk (error is no more than the effect size)
- **Red** indicates high measurement risk (expected margin of error is greater than the effect size and may not be detected at all via population NMEC methods).

[9] Calendar quarters are defined as follows: Q1 includes Jan, Feb, Mar; Q2 includes Apr, May, June; Q3 includes Jul, Aug, Sep; Q4 includes Oct, Nov, Dec

Table 2: Margin of Error Depends on the Number of Sites Aggregated and the Magnitude of Savings at the Whole Building Level[10]

Non-Residential

Portfolio Size	3% Effect	5% Effect	10% Effect	15% Effect
5	1041%	624%	312%	208%
10	804%	482%	241%	161%
25	295%	177%	88%	59%
50	281%	168%	84%	56%
100	271%	163%	81%	54%
250	198%	119%	59%	40%
500	158%	95%	47%	32%
1000	95%	57%	29%	19%
2000	70%	42%	21%	14%

Residential

Portfolio Size	3% Effect	5% Effect	10% Effect	15% Effect
5	254%	153%	76%	51%
10	206%	124%	62%	41%
25	86%	52%	26%	17%
50	84%	50%	25%	17%
100	54%	33%	16%	11%
250	36%	21%	11%	7%
500	24%	14%	7%	5%
1000	16%	9%	5%	3%
2000	11%	6%	3%	2%

This type of lookup table will convey the settlement risk associated with a calendar quarter of a given size and expected percent savings. The values in Table are based on bootstrapped standard errors using SDG&E residential and non-residential AMI data.

b. Data Preparation

SDG&E will establish a monthly data transfer procedure with the M&V team which includes both project/measure package data from implementation and AMI data for modeling. Prior to modeling, DSA will prepare the participant load data for analysis according to data structure required to implement the selected modeling approach.

- **Weather Station**: merge hourly weather data from one of the CALMAC weather stations. [11] Weather station mapping and data sufficiency will follow Section 2.4.1 of the CalTRACK Technical Appendix.
- **Define the "blackout" period, Baseline, and Reporting periods**: Using the project completion data collected during implementation, create a buffer period in either direction that is not part of the baseline or performance period. The 365 days prior to the beginning of the buffer are the baseline period. The 365 days following the buffer are the reporting period.
- **Merge the granular control profiles**: based on the characteristics of the participant, merge one or more granular profiles by date and hour.

[10] Expected Margin of Error in Performance Estimate (95% Confidence)
[11] **http://calmac.org/weather.asp**

There are several important mechanical considerations regarding the granular profiles that we believe are important to call out in this plan.

- The definition and composition of the profiles will be defined in advance, but the profiles themselves must be maintained as new meter data becomes available.
    - Because the baseline period model is fitted with the granular profile as an explanatory variable, the prediction of counterfactual energy consumption in the performance period requires the profile data be available for the performance period.
- DSA will document the profile definitions and which accounts make up each profile by June 1, 2022. Hourly AMI data for members of the synthetic control group will be transferred along with participant load data on a regular cadence.
- The SDG&E accounts that make up the synthetic control group profiles will need to be monitored for SRMAP participation, account closure, or other significant changes such as adoption of solar or batteries.
    - We plan to select alternate members for each profile to use as replacements when these type of changes occur.

c. Analytical Methods

Modeling of participant baselines in the reporting period will be accomplished using hourly AMI meter reads for the participant's site, weather data, and the incorporation of a comparison group that will account for exogeneous changes in energy consumption. The specific steps to produce estimates of program energy savings will follow the following steps:

1. For each participant in the calendar quarter population, ensure that a full year of baseline and reporting period hourly consumption interval data is available, along with hourly weather data. Each participant should also have one year of pre-baseline data, referred to in this section as the testing period, to ensure model validity. The testing, baseline, and reporting periods together comprise the analysis period.
2. Remove any data in a blackout period in between the start and end of the measure installation. The baseline period is defined as the 365 days prior to the installation start and the reporting period is defined as the 365 days after the installation end.
3. Construct the regression variables. These are defined in more detail below, but include seasonal indicators, hour-of-week indicators, temperature characteristics and control customer consumption.
4. For each participant, estimate the regression model during the baseline period. This model is a seasonal time-of-week & temperature (TOWT) model. This model includes variables for each hour of the week, a temperature spline, and one or more granular profiles that act as a synthetic control group.
5. For each participant, predict usage during the reporting period. This is the counterfactual consumption: a representation of what the participant would have done if they had not enrolled in the program.
6. The difference between the counterfactual and the observed usage is the impact of the program
7. Aggregate the results to the annual total kWh savings, the total kWh savings in the peak period and the net peak period.

The recommendation for population NMEC methods to be implemented for the SRMAP program are:

1. Use a common method for residential and non-residential sectors – synthetic controls
2. Rely on segmentation of solar status, climate zone groups, and quartiles of annual consumption for the residential sector.
3. Do additional testing of synthetic controls with a larger amount of non-residential data used to develop the granular profiles
4. Rely on a back-up method for non-residential:
    a. Produce the results using synthetic controls
    b. Assess the accuracy of synthetic controls at the site level.
    c. For large influential sites above 500 MW, if the site-level CVRMSE is above 0.5, run the backup option – a matched control group with difference-in-differences.
    d. If the site level CVRMSE for the back-up option is lower, use those results instead

The regression model used for determining participant performance will be run at the individual participant premise level. Eligible participants must have at least one full year of interval data available prior to the installation of the program measures, and program savings are estimated until the end of the first year post-installation. Participants must have corresponding hourly weather data for their premise, which can be mapped to the appropriate CALMAC weather station data using the participant's zip code. Each project in the calendar quarter population will be modeled individually.

Program savings will be aggregated to the aggregator-calendar quarter population level. A calendar quarter population is defined as all projects installed or enrolled by a specific aggregator with fewer than 365 days (one year) of savings accrued in the calendar quarter being calculated. The procedure described in the following paragraphs defines how savings are estimated and reported for a specific calendar quarter population.

The regression specification used for participant impact estimation is based on the time of week temperature (TOWT) model developed by LBNL[12]. There are five components to the regression, which is run on the hourly participant consumption data.

1. The regression constant term, representing the average base consumption for the participant.
2. Hour-of-week fixed effects. There are 7 x 24 = 168 dummy variables that capture deviations from the base consumption in each hour of the week.
3. Temperature spline. Between one and seven bins of temperature, with cut points for each temperature bin set algorithmically to ensure sufficient coverage.
4. Granular profiles. These are average hourly consumption profiles for a sample of non-participants in similar segments to the participant. The role of the granular profile is to capture information about non-weather characteristics of each date-hour that may influence participant energy consumption. Excluding these granular profiles from the model result in a simple pre-post model.
5. The error term.

[12] Quantifying Changes in Building Electricity Use, with Application to Demand Response Johanna L. Mathieu, Phillip N. Price, Sila Kiliccote, Mary Ann Piette Lawrence Berkeley National Laboratory April 2011

The exact specification is shown in Equation 1:

Equation 1: Seasonal Time of Week Temperature Model

$$kWh_{p,t} = \alpha_p + \sum_{i=1}^{168}(\beta_i * I_{i,t}) + \sum_{b=1}^{b=[2,7]}(\gamma_b * B_{b,t}) + \sum_{g=0}^{n}(\delta_g * GP_{g,t}) + \varepsilon_{p,t}$$

Table 3: Definition of Equation Terms

Symbol	Interpretation
$kWh_{p,t}$	The observed kWh consumption for participant p in date-hour t
α_p	The constant for participant p
β_i	The coefficient representing the base energy consumption for hour-of-week i, above or below the participant average
$I_{i,t}$	A dummy variable for each hour-of-week i. Equal to 1 when date-hour t is in that hour-of-week, and 0 otherwise
γ_b	The coefficient representing the marginal consumption associated with a one-degree change in outdoor temperature for temperature bin b
$B_{b,t}$	The value of temperature bin b. The construction of temperature bins is described in more detail below.
δ_g	The coefficient representing the marginal effect of one kWh change in the control group granular profile g.
$GP_{g,t}$	The average consumption of the granular control group profile g in date-hour t.
$\varepsilon_{p,t}$	The error term for participant p in date-hour t

The temperature spline is comprised of between one and seven temperature bins that relate outside air temperature to participant consumption. A spline model splits temperature from a single value in to ordered bins that correspond to the degrees Fahrenheit (or Celsius) that fall in that bin. As examples, the temperatures in Table can be represented as temperature bins in the following manner:

Table 4: Relationship Between Temperature and Spline Temperature Bins

Temperature	B_1	B_2	B_3	B_4	B_5	B_6	B_7
Condition (F)	**< 30**	**30-45**	**45-55**	**55-65**	**65-75**	**75-90**	**> 90**
25F	25						
47F	30	15	2				
65F	30	15	10	10			
83F	30	15	10	10	10	8	
101F	30	15	10	10	10	15	11

To ensure that the relationship between temperature and consumption can be robustly estimated, there must be sufficient data in each temperature bin. To that effect, the number of bins used in the regression are modified dynamically by algorithmically removing cut points between the bins. The procedure for this

pruning is described in further detail in Section 3.9 of the CalTRACK methods[13]. In brief, the procedure involves:

1. Count the number of hours in each temperature bin $\boldsymbol{B_1}$ through $\boldsymbol{B_7}$
2. If any of bins $\boldsymbol{B_1}$ through $\boldsymbol{B_6}$ have fewer than 20 observations in that range, combine the observations in that bin with the next highest bin
    a. For example, if bin $\boldsymbol{B_2}$ (30-45F) had 17 observations and bin $\boldsymbol{B_3}$ (45-55F) has 30 observations, combine $\boldsymbol{B_2}$ and $\boldsymbol{B_3}$ to create one bin from 30-55F with 47 observations
3. If $\boldsymbol{B_7}$ has fewer than 20 observations, combine it with the next lowest bin until the 20-observation criteria is met
4. Continue pruning the bins until each bin contains at least 20 observations.

An example of this pruning procedure is shown in Figure 3.

Figure 3: Pruning of Temperature Bins

Starting		Iteration 1		Iteration 2		Termination	
Bin Conditions	Count	Bin Conditions	Count	Bin Conditions	Count	Bin Conditions	Count
< 30	5	<45	35	<45	35	<45	35
30-45	30						
45-55	50	45-55	50	45-55	50	>45	59
55-65	5	55-75	6	>55	9		
65-75	1						
75-90	2	> 75	3				
> 90	1						
Total Bins	7	4		3		2	
Count	94	94		94		94	

The final element in this Seasonal TOWT model are the granular profiles. These represent the average granular (8760) consumption of a group of non-participants. Participants are matched to the correct granular profile(s) based on having similar segmentation. The regression may have one or multiple granular profiles added as explanatory (right-hand-side) variables. This approach is called a synthetic control and relies on exploiting the correlations that exist between participant loads and nearby similar customers. These customers experience similar economic conditions and other unobserved conditions that may influence energy use. This correlation does not have to be positive to yield useful information, though in practice it is often easiest to understand the intuition for this approach with positive correlations. For example, if July 4th falls on a Thursday, many residential premises may have altered consumption on Friday July 5th or even earlier in the week as households take vacation. Including granular profiles of other residential customer segments in the specification will show this change in consumption during the holiday week. Without the inclusion of the granular profiles, this information

[13] **http://docs.caltrack.org/en/latest/methods.html**

would not be observable in the model and the observed change in consumption would be misattributed to the effect of program participation.

The regression model is estimated for each season[14] in the training period, and then predicted for that season in the reporting period. The predicted hourly consumption in the reporting period is called the counterfactual consumption. These values represent what the consumption would have been had the premise not participated in SRMAP. Savings in the reporting period are simple summations of the hourly impacts by period of interest.

Because all participants must have at least one year of pre-installation data and settlement occurs at the end of the first year post-installation, all participants will have the same number of peak, net peak and off-peak observations in the reporting period. Total kWh savings in each period can simply be summed across participants and hours in that calendar quarter.

d. Comparison Group Segmentation

SDG&E will use synthetic controls on the right-hand side to model SRMAP impacts for both residential commercial participants. The residential segmentation strategy for developing granular profiles is shown in Table 5. Table 52There will be 32 distinct segments (4*2*4 combinations) each composed of a minimum 500 non-participant accounts.

Table 52: Residential Granular Profile Segments

Climate Zone Group	Solar Status	Annual Consumption Quartile
Coastal	NEM	Bottom 25%
Inland	Non-NEM	25%-50%
		50%-75%
		Top 25%

[14] Seasons are defined as: Summer – June through September. Winter – December through March. Shoulder – April, May, October, November.

Table 63 Table 6 shows SDG&E's preliminary segmentation approach for the commercial sector.

Table 63: Commercial Granular Profile Segments

Climate Zone Group	Industry Type
Coastal	Agriculture and Pumping
Inland	Automotive
	Communications
	Education
	Fitness and Esthetic Services
	Full Service Restaurants and Bars
	Gas Stations and Convenience Stores
	Government-Institutional
	Grocery
	Health
	Limited Service Restaurants
	Lodging
	Manufacturing
	Miscellaneous
	Office
	Property Management
	Religious
	Retail
	Warehouse

Any given participant site's regression model will not include all 38 profiles on the right-hand side. We anticipate using approximately ten profiles in the modeling procedure. For example, a "Lodging" site in the Coastal climate zone group would likely have the Inland Lodging profile included as well as related industries from within the same climate zone group.

e. Dual Participation on other EE and DR Programs

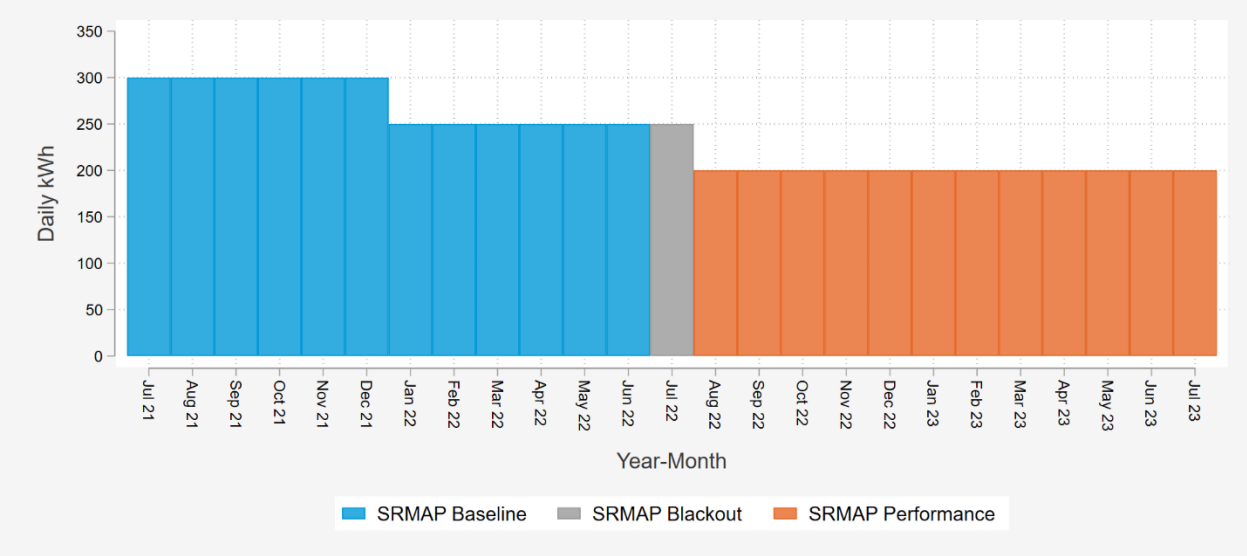
SRMAP is design to deliver incremental savings to SDG&E existing portfolio of energy efficiency and demand response programs. The program design centers on compensating projects for the grid value their SRMAP projects deliver. This requires processes to prevent over-payment or under-payment due to dual participation. Along with other project completion details, SDG&E will pass the NMEC modeling team information on current demand response program enrollments and any energy efficiency measures completed in the twelve months prior to SRMAP participation.

Recent Energy Efficiency Participation

While it would be cleaner from an M&V standpoint to disallow dual participation in SRMAP and other EE programs, SDG&E believes this would block off an excessive portion of the market and make it difficult to achieve the targeted participation levels. The threat associated with allowing customers with recently completed EE projects to participate in SRMAP is that the regression model of consumption will overstate the counterfactual if it is estimated on data prior to the non-SRMAP measure installation. The accounts selected to make up the synthetic control group profiles will not have prior EE participation by

design. Consider the simplified example shown in Figure 4 where a hypothetical participant completes an EE project outside of SRMAP in January 2022 and an SRMAP project in July 2022.

Figure 4: Recent EE Participation Example



Using the twelve months of data prior to SRMAP participation, we would estimate a baseline of 275 kWh per day. However, this is biased upward 25 kWh by the inclusion of six months of data from prior to the installation of the non-SRMAP measure which saves 50 kWh per day or 18,250 kWh annually. In this simplified example, the appropriate baseline for the site is 250 kWh per day. SDG&E plans to address this bias via a downward adjustment to the predicted baseline using the following steps. The procedure mirrors handling of a non-routine event in the baseline period for site-level NMEC.

1) Determine whether each day in the performance period requires adjustment. In the example shown in Figure 4, days in July, August, September, October, November, and December require adjustment.
2) Determine the 8760 load shape of the non-SRMAP measures based on DEER or eTRM profiles and spread the claimed kWh savings over the year.
3) Multiply the 8760 load shape from step #2 by the adjustment flag (0,1) to arrive at the hourly adjustment.
4) Subtract the calculated adjustment from Step #3 from the predicted baseline determined via NMEC.
5) Compute hourly impacts as the difference between the adjusted baseline and metered consumption during the performance period.

Enrollment in SDG&E Demand Response Programs

SDG&E offers a full-suite supply side demand response programs for both the residential and commercial sectors. The addition of Residential ELRP in 2022 will further increase DR saturation amongst potential participants. While it would be cleaner from an M&V standpoint to disallow dual participation in SRMAP and DR programs, SDG&E believes this would block off an excessive portion of the market and

make it difficult to achieve the targeted participation levels. Our proposed approach to prevent double-counting of DR impacts in the SRMAP performance estimates is as follows:

- Exclude DR event hours from the baseline model and performance period.
    - If DR events begin or end mid-hour exclude the entire hour
- Also exclude the hour prior to and following DR events to account for pre-cooling, or post-event snapback which lead to DR participants having higher load than they would otherwise.
- This ensures that DR events in the baseline period do not bias participant baseline up or down unfairly.
- It also means that sites dual enrolled in SRMAP and DR cannot earn SRMAP performance credit for participation the DR events during the summer of 2022 or 2023. This will be communicated clearly to aggregators as it has bearing on the settlement calculation.

f. Normalization

The analytical methods described above include a series of explanatory variables to capture time and weather effects in the mathematical model of energy consumption. This relationship will be modeled in the baseline period and predicted for the reporting period using the actual reporting period weather conditions. We do not plan to estimate separate regression models for the reporting period and perform parallel predictions against normalized weather conditions. This decision is based on four factors:

1) The primary objective of the program is to deliver peak and net peak reductions during summer 2022 and 2023. Measuring performance and settling with aggregators based on delivered impact during these periods of interest removes a layer of complexity and presents a clearer signal to the market.
2) It allows for faster reporting. If a separate mathematical model of energy consumption is required for the performance period, it is imperative to wait for adequate coverage of independent variables before estimating impacts. Under our proposed approach, we can measure savings as soon as the performance period begins and show cumulative sums of impacts at regular intervals.
3) We are already "smoothing" the avoided costs used to compute Total System Benefits. The CPUC's Avoided Cost Calculator loads significant capacity value on a small number of hours based on loss of load probabilities. Averaging the avoided costs by month, hour, and business day distributes the value more evenly and mitigates risk to aggregators and SDG&E that actual weather conditions during summer 2022 and 2023 will be misaligned with ACC assumptions.

g. Determination of Net Savings

Use of a synthetic control group in the NMEC procedure obviates the need for a separate assessment of free ridership and spillover. The index of non-participating accounts captures both exogenous effects, like the COVID-19 pandemic, and the effect of energy efficiency purchases and behaviors SRMAP participants would have taken absent program intervention. As such, the NMEC outputs savings estimates that are closer to net savings than to gross savings and no net-to-gross ratios will be applied.

h. Customer Settlement

The final settlement with aggregators for a calendar quarter of projects will be based upon the Total System Benefits (TSB) generated by the calendar quarter. More specifically the incentive amount is the Hourly Levelized Values of Electricity from the Avoided Cost Calculator (ACC) after removing standard values for Administrative, Marketing, and Direct Implementation Non-Incentive costs. Consistent with the intent of the Governor's emergency declaration this incentive structure compensates aggregators heavily based on savings generated during the peak and net peak periods. As a result, the load shape of the NMEC-based savings estimate is a key driver of the final compensation amount. Figure 5 visualizes the 576 load shapes for two measures in the DEER catalog. 576 load shapes are created from 8760 load shapes. They are unique by month, hour of day, and business day, for each measure. The residential HVAC measure savings, shown on the left, are highly concentrated in the summer months, while the non-residential indoor lighting shape, shown on the right, has limited seasonality and generally follows business hours on weekdays.

Figure 5: DEER 576 Load Shapes for Two Sample Measures

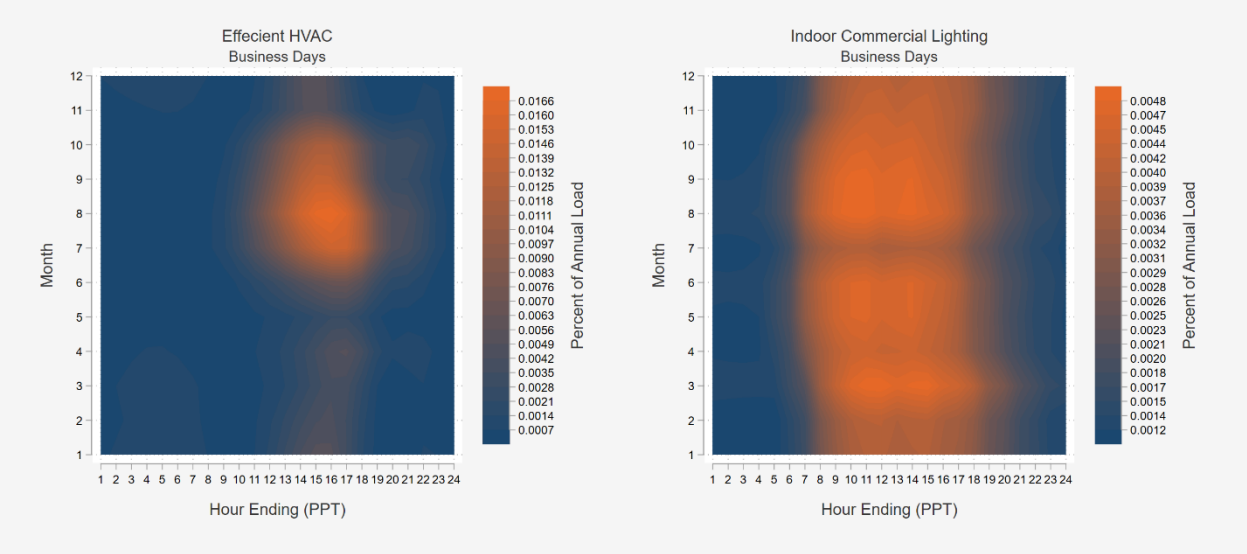


Table 7 shows the annual kWh savings by period for a hypothetical commercial lighting measure that saves 1 MWh annually using the load shape visualized on the right side of Figure 5. The TSB generated is equal to the net present value of 12 years of avoided costs, divided by 12, generated using a 7.55% nominal discount rate[15]. In this example less than 25% of the annual savings for the indoor commercial lighting measure occur during the high-value peak and net peak periods and because Net Peak and Peak rates are higher than Off-Peak rates, the TSB generated per unit of energy saved is about 75% for these periods.

[15] SDG&E authorized Rate of Return

Table 7: Total System Benefits ($2022) by EUL (CZ07) – Non-Res Lighting

Period	Annual kWh Saved	EUL = 2	EUL = 5	EUL = 10	EUL = 15	EUL = 20
Peak	76	$21	$52	$103	$155	$207
Net Peak	164	$36	$91	$181	$272	$363
Off-Peak	760	$18	$46	$92	$137	$183
Total	**1,000**	**$75**	**$188**	**$376**	**$565**	**$753**

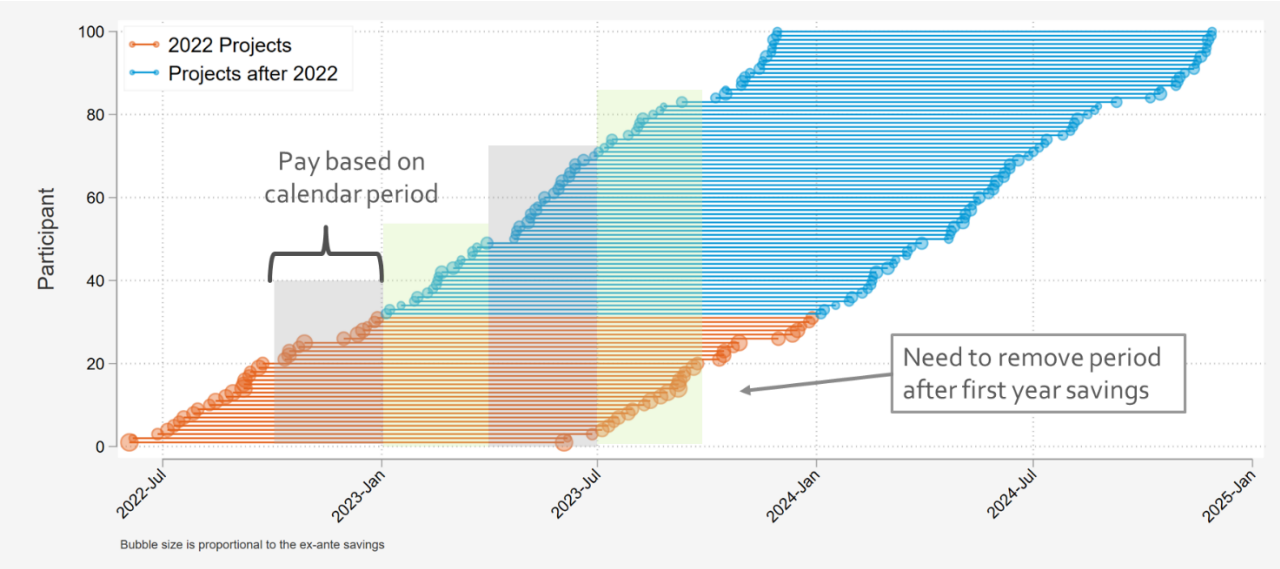
Table 8 shows the same information for a residential HVAC measure that also saves 1 MWh annually. Almost 40% of the annual savings occur during the high-value peak and net peak periods so the TSB generated per unit of energy saved is much higher.

Table 8: Total System Benefits ($2022) by EUL (CZ07) – Residential HVAC

Period	Annual kWh Saved	EUL = 2	EUL = 5	EUL = 10	EUL = 15	EUL = 20
Peak	78	$50	$126	$252	$378	$503
Net Peak	314	$149	$372	$744	$1,116	$1,488
Off-Peak	608	$16	$40	$80	$121	$161
Total	**1,000**	**$215**	**$538**	**$1,076**	**$1,615**	**$2,153**

Figure 6 illustrates the back-end performance based settlement procedure which will be performed by calendar quarter. Individual projects are denoted by the horizontal orange and blue bars in the figure, each with differing installation dates. The NMEC population for each calendar quarter for each aggregator includes all projects with less than 365 days of savings remaining. Note that this means that a calendar quarter will include projects with varying installation dates: 1) projects installed in that calendar quarter for which only a partial quarter of savings will be counted, starting from the installation date; 2) projects installed in one of the previous three quarters, for which the full quarter of savings will be counted; and 3) projects installed four quarters prior, for which only the remaining partial quarter of savings through the one year expiration date will be counted. The performance payment paid in each calendar quarter will be spread across four quarterly milestone payments (alternating grey and green vertical bands). For installations made during a calendar quarter, the period prior to installation will be removed from the payment calculation. For installations made more than 365 days in the past, days after the 365th day will be removed from the payment calculation. For each quarterly payment, SDG&E will total the savings for each period within the quarter, apply the corresponding period incentive rates, multiply by the weighted average EUL determined during the upfront review, and compute the incentive earned.

Figure 6: Hypothetical Calendar Quarter Settlement



Once the quarterly performance estimates are finalized for a given calendar quarter, SDG&E will issue the settlement payments. Payment calculation will occur at the end of each four 3-month performance periods. Settlement will lag the close of the performance period approximately 60 days to allow for validation and transfer of meter data to the modeling team and analysis. Table 9 shows the program lifecycle for a hypothetical calendar quarter of projects completed during the first quarter of 2022. The payment made in Q4 (shaded green) is expected to be largest for this calendar quarter because it compensates the aggregator for performance during Q3 (July, August, and September) when avoided costs are highest and most of the peak and net peak hours occur.

Table 9: Sample Payment Cadence for a Project

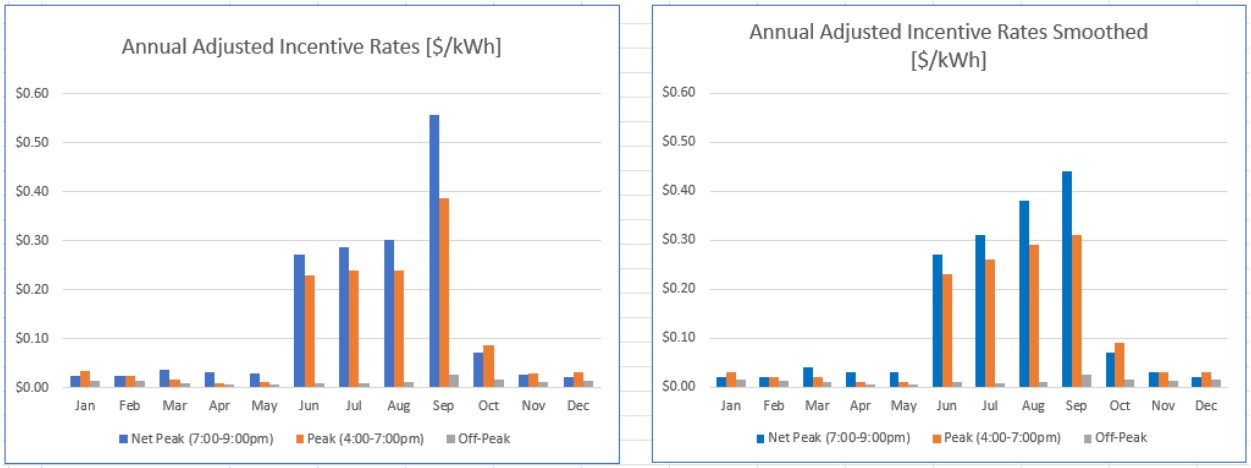
Quarter[16]	Activity	Installation Payment	Performance Payment
2022-Q2	Project Installation and First (partial) quarter of performance measurement	Based on agreements with aggregator and savings forecast for projects completed in 2022-Q2. Payment occurs in the month following installation so may fall in Q2 or Q3	None
2022-Q3	Second quarter of performance measurement		Payment based on measured impacts in Q2 of 2022 (partial).
2023-Q4	Third quarter of performance measurement	None	Payment based on measured impacts in Q3 of 2022 (full).
2023-Q1	Fourth quarter of performance measurement	None	Payment based on measured impacts in Q4 of 2022 (full).
2023-Q2	Project Expiration Fifth (partial) quarter of performance measurement	None	Payment based on measured impacts in Q1 of 2023 (full).
2023-Q3		None	Payment based on measured impacts in Q2 of 2023 (partial).

These payments are equal to the total incentive amount earned net of any Installation incentive issued based on the savings forecast that have not already been recovered.

While SDG&E and its M&V contractors will estimate 8760 load impacts and the CPUC's avoided costs are on an 8760 basis, a "collapsed" set of impacts and avoided costs will be used to compute TSB and settle with aggregators. The rationale for using collapsed avoided costs and impacts is to smooth out the avoided costs to mitigate risk to SDG&E and aggregators. SDG&E calculated 36 separate rates, three rates each (Net Peak, Peak, Off-Peak) for each of the 12 months of the year. Summer Net Peak and Peak rates were "smoothed" out for a more even distribution of these rates by moving some of the incentive dollars for September to July and August as shown in Figure 7. Figure 7

[16] Because the program will commence in June, quarters are defined as follows: Q1: Jan, Feb, Mar; Q2: Apr, May, Jun; Q3: Jul, Aug, Sep; Q4: Oct, Nov, Dec

Figure 7: Incentive Rates before and after Adjustment for Summer – CZ07



i. To-Code Savings

Existing energy efficiency programs count savings as anything above code level baseline measures or efficiency levels. The SRMAP program, in contrast, does not limit qualifiable savings by measure type or relative to code minimums. The NMEC savings calculation will produce total savings, including to-code savings. As described above, dual participation projects will be adjusted to avoid double counting for savings above code minimums. This adjustment will essentially subtract the savings attributed to the energy efficiency program. Any remainder will include any savings attributable to SRMAP, including to-code savings.

4. Data Collection

Data collection for purposes of M&V and settlement falls in two primary categories:

1. **Project Completion Information (continuous).** As aggregators complete projects, SDG&E collects a set of information about the participating customer, the efficient equipment installed, the expected energy savings, the date the work was completed etc.
    a. Along with the project information, customer characteristics, and other meta data associated with initial project completion package, SDG&E will extract and transfer the last 12 months of hourly AMI data for the new set of participating sites.
2. **Ongoing transfers of hourly load data (monthly)**. Includes all accounts that make up the granular profiles as well as all participants that have not reached the end of their 12-month performance period. SDG&E will establish a regular data transfer process to the analysis team once AMI data has been processed and finalized. We expect the transfer, including data validation, to DSA will occur approximately 45 days after the end of the month. For example, August interval data will be transferred for analysis by October 15th.

SDG&E and its contractors will preserve all customer, project, and load data for sharing with the CPUC upon request for evaluation or other purposes.

5. Reporting

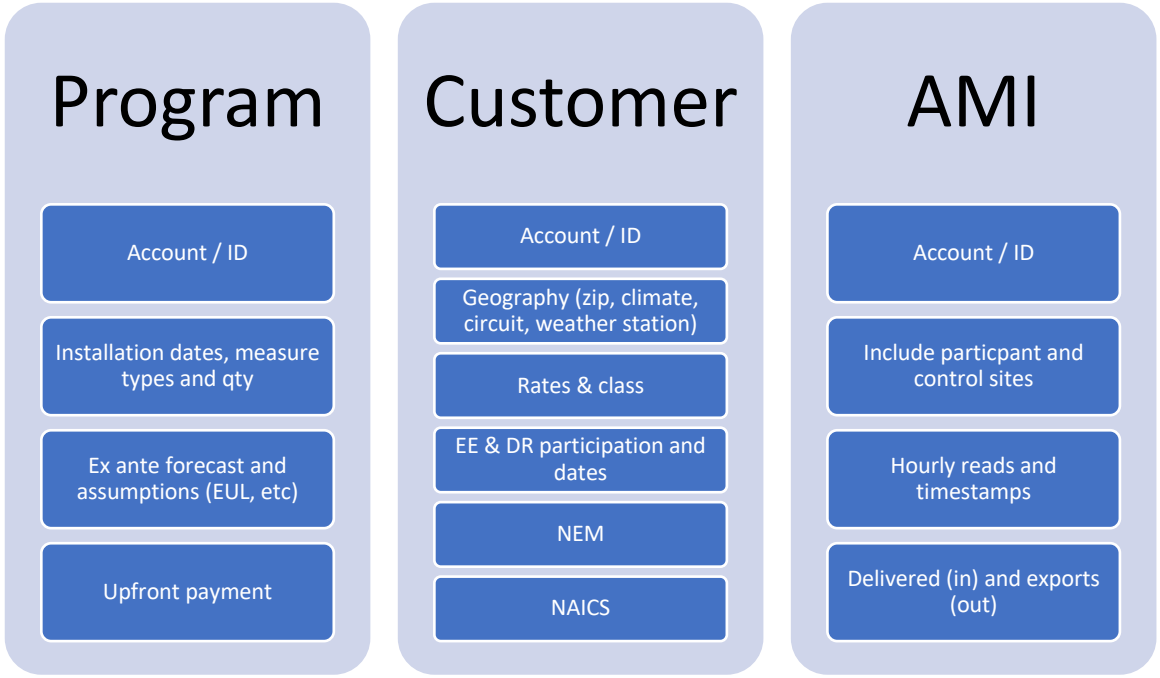
Reporting requirements are currently being discussed with the Energy Division.

j. To Program Aggregators

k. To the CPUC and Other Stakeholders

6. M&V Data Requirements

a. Overview



b. Detailed request

Request	Detail	Purpose/notes
1. Customer characteristic file for participants and sites selected to be part of the granular control profiles	For each account that completes an SRMAP project between June 1, 2022 and September 30, 2023: a. Customer name (non-residential) b. Customer ID (non-residential) c. Account number d. Premise ID	Customer characteristics will be used to: ▪ identify participants, ▪ map to control profile ▪ produce results by segment

Request	Detail	Purpose/notes
	e. Service point ID f. Rates and effective dates of rates for 2020 – 2024 g. Annual max demand (non-residential) h. CARE / FERA flags i. Net metering status, date that NEM status became effective, installed capacity, and type of interconnected device (solar, batteries, etc.) j. NAICS industry codes, if applicable k. Zip Code l. Climate Zone m. Weather Station n. DR enrollment information (program and enrollment date) o. Any additional EE measures installed on site (savings estimate and installation date) p. Any other relevant customer demographics	
2. Project Information	a. Account number b. Premise ID c. Service point ID d. Project number e. Measure ID f. Type of measure (lighting, HVAC, etc.) g. Measure name h. Key dates (project start, project completion, approval date) i. Implementation contractor j. EUL (by measure) k. Measure quantity l. Deemed or estimated first year savings (by measure- annual kWh, peak kW, net peak kW) m.	
3. Hourly interval data for participant and site selected to be part of the granular control profiles	a. Account numbers (account number, premise id, service point id, etc.) b. Date c. Hour/Interval d. kW delivered	Interval data will be used to estimate energy and demand impacts

Request	Detail	Purpose/notes
	e. kW exported (if applicable) f. QC code, if applicable	
4. Weather data for relevant stations from June 1, 2020 to May 31, 2024	a. Station ID b. Station Name c. Date d. Hour e. Temperature (dry bulb) f. Humidity	http://calmac.org/weather.asp Weather data will be used to model energy use
5. DR Event data June 1, 2020 to May 31, 2024 for all DR programs	a. Program name b. Event date c. Event start d. Event end e. Dispatch group called	▪ Please include all commercial programs/rates so we can account for dual enrollments