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Implementation Plan

Local Commercial Strategic Energy Management (SEM) Program

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# Program Budget and Savings Information

## Program and/or Sub-Program Name

CLEAResult Local Commercial Strategic Energy Management (SEM) Program

## Program and/or Sub-Program ID Number

TBD

## Program and/or Sub-Program Budget Table

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Costs | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | Total |
| Administration | $ 355,104 | $ 382,452 | $ 367,649 | $ 389,708 | $ 413,091 | $ 452,460 | $ 2,360,464 |
| Marketing/Outreach | $ 103,229 | $ 101,591 | $ 52,434 | $ 52,434 | $ 52,434 | $ 52,434 | $ 414,556 |
| Incentive/Rebate | $ 957,125 | $ 971,375 | $ 836,000 | $ 836,000 | $ 836,000 | $ 836,000 | $ 5,272,500 |
| Direct Implementation | $ 1,910,663 | $ 3,507,553 | $ 3,886,989 | $ 3,864,930 | $ 3,841,547 | $ 3,802,178 | $ 20,813,860 |
| Total | $ 3,326,121 | $ 4,962,971 | $ 5,143,072 | $ 5,143,072 | $ 5,143,072 | $ 5,143,072 | $ 28,861,380 |

## Program and/or Sub-Program Gross Impacts Table

Savings are estimated based on historic SEM savings compared to total baseload and paired with the potential baseload for the program and will be calculated based on the most recent California SEM M&V Guide (v 3.02), linked in Section C.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Gross Impacts Table | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | Total |
| Expected Total System Benefit ($) | 5,403,246 | 8,225,371 | 8,420,152 | 8,136,612 | 7,767,192 | 7,332,980 | 45,285,553 |
| Gross Energy Savings (kWh) | 6,284,250 | 9,276,750 | 9,576,000 | 9,576,000 | 9,576,000 | 9,576,000 | 53,865,000 |
| Gross Gas Savings (therms) | 369,360 | 615,600 | 656,640 | 656,640 | 656,640 | 656,640 | 3,611,520 |

## Program and/or Sub-Program Cost-Effectiveness (TRC)

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Cost-Effectiveness (TRC) | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | Overall Portfolio TRC |
| TRC | 1.24 | 1.20 | 1.23 | 1.28 | 1.32 | 1.34 | 1.27 |

## Program and/or Sub-Program Cost-Effectiveness (PAC)

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Cost -Effectiveness (PAC) | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | Overall Portfolio PAC |
| PAC | 1.65 | 1.80 | 1.92 | 1.99 | 2.05 | 2.08 | 2.37 |

## Type of Program and/or Sub-Program Implementer

| **Program Implementer** |  |
| --- | --- |
| PA-delivered |  |
| Third Party-Delivered |  |
| Partnership |  |

## Market Sector

| **SCE Business Plan Sector** | **Yes** |
| --- | --- |
| Residential |  |
| Commercial |  |
| Industrial |  |
| Agricultural |  |
| Public |  |
| Cross-Cutting |  |

## Program and/or Sub-Program Type

| **Program Type** |  |
| --- | --- |
| Resource |  |
| Non-Resource |  |

## Market Channels and Intervention Strategies

| **Market Channels** |  |
| --- | --- |
| Upstream |  |
| Midstream |  |
| Downstream |  |
| **Intervention Strategies** |  |
| Direct Install |  |
| Incentive |  |
| Finance |  |
| Audit |  |
| Technical Assistance |  |
| Other |  |

## Campaign Goals and Timeline

|  |  |  |  |
| --- | --- | --- | --- |
| **Phase** | **Key Deliverable(s) / Milestone(s)** | **Dates/Duration** | **% of TSB** |
| **Launch Readiness** | * Implementation Plan * Program Manual * Program Materials/Forms * Date Program is Available to Customers * Pipeline Development | 5/15/2024-8/30/2024 | 0% |
| **Ramp Up** | * Marketing Plan Implemented * Pipeline Development | 9/1/2024-12/31/2024 | 0% |
| **Steady State** | * Energy Savings * Pipeline Development | 1/1/2025-6/30/2029 | 83.7% |
| **Ramp Down / Transition** | * Energy Savings * Program Ramp Down Plan * Close out pipeline * Date Program is No Longer Available to Customers | 7/1/2029-12/31/2029 | 16.3% |
| **Measurement & Payment** | * Completion of energy savings reporting/payments, if required | N/A | 0% |

# Implementation Plan Narrative

## Program Description

The CLEAResult Local Commercial SEM Program goes beyond traditional efficiency programs with the implementation of SEM. SEM is a holistic, whole facility approach that uses normalized metered energy consumption with a dynamic baseline model to determine energy savings from all program activity at the facility, including capital projects, custom and deemed calculated retrofits, maintenance and operation, and retro-commissioning projects. The SEM program for the commercial sector requires a multi-year customer commitment to participate in multiple cohort-type training workshops, individual or cohort energy analysis site and Measurement and Evaluation (M&V) activities based on information and characteristics of the facility’s specific operations.

The Local Commercial SEM program targets customers across the commercial sector and delivers savings to diverse building types owned by public/private entities.

The objective of the design is to use SEM to establish a foundation on which to acquire measurable energy efficiency savings, through helping customers develop a systematic approach to managing energy CLEAResult’s targeted, yet flexible approach, coupled with streamlined processes and robust quality management will yield a cost-effective program that serves SCE's commercial sector customers.

The Program will adhere to all guidance outlined in the most recent version of the California SEM Design and M&V Guides, linked in Section C.

## Program Delivery and Customer Services

Program Offerings Delivery

The program will employ one main strategy to deliver savings: savings which come from engaging customers in SEM activities as laid out in the California SEM Design Guide. As discussed in the Design Guide, the SEM program is delivered to a customer through a progression of educational modules and site-specific activities that take place over each of the two-year cycles. The progression of educational modules and site-specific activities build upon each other within and between the cycles.

This long-term, six-year approach gives the program the ability to continually develop the customers’ understanding, skills, and capabilities relative to energy while consistently delivering energy savings. The six-year duration also allows the program to elevate activities generally provided by other SEM programs (e.g., treasure hunts, energy maps, employee awareness) into well established and defined business practices that have the ability be continued by the customer without program support once their SEM engagement has ended. This approach means that the ability of a customer to manage their energy by the end of the program’s sixth year should be much improved from their ability to manage energy at the beginning of the first year.

The primary objectives of the SEM program design are:

1. To cost-effectively acquire measurable energy efficiency savings and total system benefits (TSB) by,

2. Helping customers develop a systematic approach to managing energy while,

3. Ensuring the customer can manage the system they have developed and continue saving energy after program completion.

An additional consideration is that for many customers, “managing energy” will not necessarily mean only managing “energy efficiency”, or energy consumption. Customers, especially as they mature through the SEM program, can and should use their energy management business practices as a means to manage all the energy-related objectives that might be important to them, such as energy consumption reduction, energy demand reduction, the time at which energy is consumed, and energy-related GHG emissions reductions, among others. This will become important as both customers and program administrators look to meet broader energy- related objectives such as the CPUC’s Total System Benefits, Integrated Demand Side Management (IDSM), zero net-energy, decarbonization, peak load reduction, etc. Hence, secondary objectives of the SEM program design are to:

1. Integrate education on using energy management business practices to manage broader energy-related objectives and,

2. Provide options for activities that give customer support for integrating those objectives into energy management business practices so that,

3. Customers can strategically implement a wide variety of demand-side opportunities.”

SEM savings will be measured utilizing methods in alignment with the California SEM M&V Guide (as of June 2023, v 3.02), the latest statewide guidance. The California SEM M&V Guide was created using ASHRAE Guideline 14:2014, BPA MT&R Reference Guide, ETO Energy Production Efficiency, Energy Intensity Modeling Guideline, v2.2 and others which utilize the same M&V methodologies for SEM across all business sectors. For SEM offering information see Section B.11 Additional Information.

**Customer Outreach**

Initial outreach will be performed by CLEAResult Account Managers who will contact facilities and go through an initial evaluation of the energy efficiency potential of that facility. Customers will be recruited to participate in an SEM cycle, which delivers cost-effective savings to facilities that oversee and maintain building and infrastructure portfolios.

The Local Commercial SEM Program will help commercial sector customers identify top savings opportunities, implement low/no-cost operations and maintenance improvements, and prioritize efficiency projects to drive rapid energy savings and integrate demand response (DR) opportunities, while institutionalizing persistent energy performance practices and policies.

**Customer Services and Support Tactics**

The Local Commercial SEM program uses a cohort approach for delivering educational modules and a mix of group and individual on-site activities. CLEAResult will be targeting 45-65 commercial organizations, especially in the fastest growing regions of SCE territory such as Inland Empire. The number of customers per cohort will be flexible, in relation to geographic location and business sector to maximize engagement. CLEAResult may have multiple cohorts running concurrently or spaced out to meet customer needs. CLEAResult anticipates reaching required baseload recruitment goals for participants within six months to a year from the commercial sector.

A major way SEM will support customers is by educating participants (including but not limited to key decision makers, managers, operators and employees in general) at participant facilities to be energy experts who will continue to drive energy savings after their initial program touchpoint. We teach participants to better understand their energy usage, recognize energy improvement opportunities, and envision a long-term energy roadmap. Historically, our SEM participants go on to complete more capital projects than participants in other C&I energy efficiency programs, and many opt into ongoing SEM participation. As discussed in the California SEM Design Guide, “The SEM program is delivered to a customer through a progression of educational modules and site-specific activities that take place over each of the two-year cycles. The progression of educational modules and site-specific activities build upon each other within and between the cycles.”

This long-term, six-year approach of SEM gives the program the ability to continually develop the customers’ understanding, skills, and capabilities relative to energy while consistently delivering energy savings. The six-year duration also allows the program to elevate activities generally provided by other SEM programs (e.g., treasure hunts, energy maps, employee awareness) into well established and defined business practices that have the ability be continued by the customer without program support once their SEM engagement has ended. This approach means that the ability of a customer to manage their energy by the end of the program’s sixth year should be much improved from their ability to manage energy at the beginning of the first year.

These details are further explained in section B.11 and the California SEM Design Guide, referenced in Section C.

**Hard to Reach and Disadvantaged Communities**

In traditional downstream program designs, direct program outreach and technical assistance in hard-to-reach (HTR) and disadvantaged communities (DAC) is often costly because many of these customers are located in smaller, rural communities spread out across SCE’s service territory. Rural and DAC areas offer unique barriers to participation, and to overcome these to make the program accessible, we will use webinars and virtual peer-to-peer learning events to reach remote locations and help them feel connected. This virtual capability minimizes travel and increases the number of events we can deliver.

CLEAResult’s SEM programs offer a pathway to reach diverse communities and organizations with high levels of service and rapid realization of low/no cost energy savings. This model encourages a collective increase of enthusiasm for energy efficiency and a recognition that gains in efficiency are available to all customers. In addition, including these smaller communities within the program cohorts helps not only reduce the cost of serving each customer, but also reduces the savings delivery risk for the program by spreading the contribution of savings across a more diverse group of participants. SEM will focus on recruitment of entities across the spectrum of the program’s target customers and will determine the total number of participants based on the anticipated baseload of each customer with a commitment to ensure there is diversity across cohorts in-line with overall Program goals. Customers will be enrolled on a first come, first served basis, and the final number of participants will be determined based on the potential savings of the total baseload.

For projects implemented within HTR and within DACs that are also located in areas with constrained grid resources, the program will offer support seeking alternative funding and grants these communities may be uniquely qualified for. We will also leverage our coaches’ and auditors’ professional networks to identify prospects using a Diversity, Equity, and Inclusion (DEI) lens and to have targeted conversations with local stakeholders about how to increase representation from diverse communities.

The program will utilize a regional targeting approach to identify participant candidates in the top quadrant of HTR and DAC communities, through identifying zip codes with a CalEnviroScreen score of 4.0. CLEAResult’s analysis of the CalEnvironScreen 4.0 Draft data estimates approximately 40 percent of SCE’s customers reside in a DAC.

Over the course of the program, CLEAResult will include tracking of projects located in HTR and DAC in terms of quantity of projects, energy savings, and incentives paid. These KPI’s (Defined in Section B.5) will be monitored and our approach to recruiting and serving these customers will be evaluated and adjusted in accordance with our overall process of continuous improvement.

CLEAResult’s efforts will be focused on three key strategies:

* Curriculum Enhancement: CLEAResult will embed workforce education and training into the existing SEM curriculum with the objective of connecting course content directly to participating organizations. These enhancements will further educate participating organizations on community reach, sharing of success stories of other like industrial organizations experiences in internship offerings, community involvement and other strategic wins directly impacting HTR and DAC communities.
* Rural and DAC Cohorts: CLEAResult has recruited hundreds of organizations across sectors and both within and outside metropolitan areas across many SEM programs. Rural and DAC areas offer unique barriers to participation, such as physical separation from urban areas and lack of resources, and CLEAResult has successfully leveraged existing local relationships and enlisted the help of participants to help recruit others in these scenarios. CLEAResult’s experienced coaches use webinars and virtual peer-to-peer learning events to reach remote locations and help those participants feel connected to a community in their journey to greater efficiency. CLEAResult’s virtual capability and skill utilizing virtual contacts effectively so participants feel heard and seen and have opportunities for whole-hearted participation, minimizes travel, increases the number of events that can be delivered, and keeps participants with distance barriers engaged and involved so their program participation is successful for their facility.
* Rural and DAC program outreach: CLEAResult will identify facilities that serve DAC and HTR communities. CLEAResult will work with underserved community organizations and stakeholders to identify past and persistent barriers to program participation and work with those organizations to overcome their unique challenges.

**Strategic Energy Management:**

SEM programs have proven to be a successful approach to significantly reducing energy consumption across a wide array of sectors, including public entities. The CLEAResult SEM team is well versed in delivery of SEM programs and working with participants to work through the challenges of implementing a robust energy management system.

The Local Commercial SEM program will be offered in both a cohort-style and individual format and will have a subset of objectives in addition to the overall program objectives. The primary objectives of the SEM offering design, which align with the California SEM Design Guide, are:

* To cost-effectively acquire measurable energy efficiency savings by helping participants develop a systematic approach to managing energy while ensuring the participant can manage the system they have developed and continue saving energy after program completion.

Secondary objectives of the SEM offering design are to:

* Integrate education on using energy management business practices to manage broader energy-related objectives and provide options for activities that give participants support for integrating those objectives into energy management business practices so that participants can strategically implement a wide-variety of low/no-cost energy saving projects.
* Introduce commercial sector participants to additional clean energy opportunities in water efficiency, demand response, renewable energy, project financing and carbon emissions mitigation.

Additional objectives that support the primary and secondary objectives above include:

* Implement energy efficiency projects and save energy, with a focus on Behavioral, Retro-Commissioning and Operational.
* Establish a robust, continuous Energy Management System (EnMS) at the facility that impacts company culture in a positive way.
* Quantify and report facility-wide energy performance.
* Getting peers to talk to one another - participants learn more by hearing from, and talking to, their peers.
* Achieving a balance between saving energy and building EnMS practices.

To achieve energy savings goals, the program will use a cohort or individual organization format that includes training workshops and individual one-on-one and onsite activities. A dedicated SEM coach supports each participant site from beginning to end of the program to help them meet SEM offering objectives and their own goals. The California SEM Design Guide provides for delivering SEM to participants either via a cohort or as an individual entity. CLEAResult’s primary method will be to recruit multiple customers to participate in cohorts. However, we will maintain the ability to support sites in an individual way as long as that support helps meet overall program savings goals.

Site activities include conducting an energy opportunities Treasure Hunt and recording findings in an Opportunity Register. The energy coach (for definition see Additional Information, section 2 below) and engineering staff help identify and provide technical project management support for implementation of behavioral, retro-commissioning and operational, as well as capital, custom and deemed energy efficiency projects.

SEM Services Provided:

Participants who choose to participate in the program will be guided and coached by the CLEAResult SEM team who will follow the California SEM design guide. Participants pursuing the SEM pathway will be treated with the following services in alignment with the California SEM Design and M&V guidelines:

* Individual kick-off meeting to lay out clear program expectations
* Cohort or individual facility workshops with clearly defined learning objectives and well facilitated peer-to-peer learning that include strategies on:

Developing SEM

* + Identifying and Implementing Energy Savings Projects
  + Employee Engagement
  + Persistence of Savings
  + Tracking Energy Performance through Energy Modeling or alternate measurement and verification methodologies
  + Designing and Implementing an Energy Management Information System
* Onsite and/or virtual energy Treasure Hunt to identify energy waste and savings opportunities. The identified opportunities will be captured in an Opportunity Register. More information is contained in the California SEM Design Guide, linked in Section C.
* Onsite and remote support for: goal development, employee engagement, energy map development, energy data collection and data logging, project savings persistence strategies, as well as annual updates to key activities.
* Development of an energy savings regression model and annual updates to meet the requirements of the CA SEM M&V guidance.
* Implementation of an Energy Management System Assessment to assess progress on customer EnMS and plan future improvements.
* Identify, scope and provide technical support for project implementation.
* Where appropriate, supporting the customer in defining and implementing an Energy Management Information System (EMIS) to better track, report, and make decisions on energy data.

## Program Design and Best Practices

Local Commercial sector market barriers will be addressed by the program through the following strategies and tactics:

|  |  |
| --- | --- |
| Market Barriers | Mitigation Strategies, Output and Outcomes |
| Wide Range of Technical Expertise and Organizational Maturity, Lack of Tools and Expertise | **Strategies:**  Targeted SEM recruitment and tailored program services such as audits, virtual assessments, engineering support. Cohort workshops introduce proven, highly refined tools and process for EnMS  **Output/Outcomes:**   * Program services and value propositions for participants * Champions identified, strategy defined and participation authorized * Onsite activities provide highly skilled engineering services to map energy use and identify energy-saving opportunities * Tracking and M&V to build robust models of gas and electric use * Train participants to use and maintain models * Facilitate peer-to-peer learning * Additional participants mature to SEM-capability. Energy Action Plan timelines accelerated. * SEM cohort Alumni engage in continuous improvement |
| Security and Access Restrictions | **Strategies:**  Personnel & subcontractor pre-screening and robust IT security policies  **Output/Outcomes:**   * Physical and digital access granted for SEM Treasure Hunts, and in-person and virtual assessments * Energy use monitored to measure performance |
| Rigid Financing and procurement hurdles | **Strategies:**  Integration of On-Bill Financing (OBF), alternative funds sourcing, and direct incentives  **Output/Outcomes:**   * Flexible participation options adapted to policy constraints and producing net positive economic benefits * Deemed and Custom incentives paired with OBF drive measure-based equipment retrofits * Meter-based incentives unlock savings potential unavailable through deemed and custom pathways * Alternative sources of project funding can include complimentary programs, that implement cleaner technologies. Other sources of funding can also include local bond funds, federal grants, or third-party financing through groups like the National Energy Improvement Fund (“NEIF”). CLEAResult is also closely monitoring legislation, such as AB841, for opportunities to further address financial barriers to project implementation. Establishing the need and applicability of alternative sources of funding is project by project; subject to location of facility, size of project, types of measures to which alternative sources could apply, and propensity for a public facility to utilize a debt instrument to facilitate the project. CLEAResult will help each project identify alternative funding applicable to fit its specific need. |
| Lack of organizational commitment to strategic energy management | **Strategies:**  CLEAResult’s process ensures that participating organizations have a full understanding of what participation entails and are committed to the process  **Output/Outcomes:**   * Screening and recruiting customers * Training for the executive sponsor * Regular meetings with executive management, including reviewing Treasure Hunt results, gaining their input and approval on project lists and priority * Establishing and engaging communication and coordination across participant functions (i.e., maintenance, production, purchasing, accounting, etc.) to ensure understanding and participation across the organization |
| Commitment of Resources | **Strategies:**  Peer interactions through cohort workshops strengthen commitment. Onsite activities engage multiple stakeholders within the organization  **Output/Outcomes:**   * Tracking and M&V show clear progress and benefits across multiple business objectives |
| Changes in site personnel or facilities | **Strategies:**  CLEAResult’s experience is that one or more of the SEM program participants will go through a change in personnel within the program period. We have learned to mitigate this risk by ensuring:   * Two or more personnel at each participant facility attend each educational module * Establishing and maintaining executive sponsor contact * Well documented work products * Establishing succession plans for key roles on an energy team * SEM coach support to onboard new energy team staff   Facilities can also experience changes, depending on the nature of operations, as they go through the program. The SEM approach is flexible, and when facility use changes, SEM coaches and staff can help support the facility with these changes while still capturing savings activities  **Output/Outcomes:**   * Improved transfer of knowledge within the participating organization, program recommendations established as institutional policy and standard practice |
| Frustration with standard offerings | **Strategies:**  Skillful facilitation of SEM workshops to maximize engagement and participation. One-on-one SEM coaching and support customized to meet participant needs  **Output/Outcomes:**   * Streamlined future participation in incentive programs by introducing clear documentation and measurement practices. * More educated, empowered customer – CLEAResult provides the process, the skills and the knowledge for customers to move forward. |

SEM provides the benefits of non-resource activities such as project technical assistance, developing energy plans, and hosting workshops, while also driving resource acquisition in the form of measured savings.

CLEAResult’s SEM cohorts will consist of customers from different commercial facilities, each bringing their own experiences and perspectives that enrich the SEM cohort experience. CLEAResult’s approach addresses concerns in recent evaluations that smaller or rural commercial sector customers may get ignored by third party programs. CLEAResult’s approach relies on a diverse group of participants to enrich the customer experience and also spread program delivery risk across a broader population of customers.

Program data will be managed through CLEAResult’s internal SharePoint to store, process, and utilize customer data for M&V efforts. That will provide a centralized data management system enabled by simplified integrations, streamlined workflows, and improved data consistency. CLEAResult’s experience in working in the California regulatory environment will inform the configuration CLEAResult’s data management platform, collecting all required data points needed for both project support and submittal. In addition, past evaluations have noted persistent challenges with inconsistent or incomplete data. CLEAResult’s digital platform will address both of these challenges. CLEAResult’s highly configurable and flexible cloud-based platform offers low in-house maintenance costs, reducing repetitive administrative tasks and enabling staff to leverage the platform from a business and administrative perspective. Using different portals, user profiles and roles, CLEAResult will optimize each user’s experience, providing an intuitive interface with the required information and functions. CLEAResult’s data management platform supports seamless integration with partner tools and databases, enabling a holistic customer experience. Automated data connections will facilitate better data tracking and efficiency while creating a seamless customer participation experience.

The measure mix for the Local Commercial SEM program is thoughtfully curated to maximize cost-effectiveness while balancing measures popular with commercial sector customers. The measure mix allows customers to benefit from new savings opportunities enabled by AB 802 and meter based SEM program guidelines. The Local Commercial SEM program will also educate customers and trade allies on program rules, avoiding double-dipping and the appropriate channels for statewide and local EE measures. In addition, CLEAResult has coordinated the programs measures with the launch of new statewide programs to reduce the risk of double-dipping and competition with upstream and midstream programs. With the cooperation of other programs, CLEAResult’s data management platform can be configured with secure APIs that enable cross-referencing of program participation data, such as equipment serial numbers, to identify and flag potential instances of double-counted savings.

## Innovation

The Local Commercial SEM Program design includes several innovative and flexible elements to accelerate EE advancement in commercial facilities while driving increased satisfaction and deeper engagement among program participants and regional stakeholders. CLEAResult’s innovative program elements include:

1. Innovative Recruitment and Outreach – Key to SEM program success is recruiting SEM participants that are willing, capable and interested to invest time and effort into the program. To recruit effectively, CLEAResult will engage with one or more partners who have existing relationships with current customers, partnering organizations and firms supporting the commercial sector within SCE territory.

CLEAResult will establish strategic partnering with selected manufacturers and trade allies to reach a broad customer segment. By directly working with manufacturers with EE technologies, the program will have access to commercial end-users and SEM prospect participants.

The program will work with channel partners that provide services – ranging from equipment installation to controls installation/integration to plumbing – to commercial customers. Through a robust network of channel partners, the program will gauge the pulse of the market to target outreach efforts. Channel partners provide information on customer interest and the likelihood of customers performing EE upgrades.

2. Hybrid Virtual/in-person Delivery – CLEAResult will provide the innovative opportunity to conduct key components of the program virtually, enabling participation in key program steps even when schedules make in-person meetings challenging for participants. CLEAResult’s virtual delivery ensures continuity of programming and learning.

3. Streamlined Approach to Total System Benefit (“TSB”) – Given the Decision on Assessment of Energy Efficiency Potential and Goals and Modification of Portfolio Approval and Oversight Process, CLEAResult’s understanding and calculation of implemented SEM measures is set up to both maximize cost effectiveness in the current rule set while driving the adoption of measures that will score well under the TSB metric.

4. Inclusion of Greenhouse Gas (“GHG”) into Program Delivery – CLEAResult educates customers about reducing GHG emissions. CLEAResult’s skilled SEM and decarbonization teams have helped companies all over North America target GHG emissions through SEM delivery. The contents of this document are subject to restrictions on disclosure as set forth herein. decarbonization experts and engineers specializing in climate change and decarbonization help guide program participants towards achieving GHG reduction goals education and support on climate change mitigation, GHG reduction, decarbonization, and resiliency. Services include:

* Workshops for program participants to understand and quantify their baseline GHG emissions. A baseline is crucial for developing an effective decarbonization plan that considers the unique emissions profile of each building. CLEAResult provides education on the GHG Protocol Corporate Accounting and Reporting Standard, with requirements and guidance for organizations preparing corporate-level GHG emissions inventories.
* CLEAResult will educate participants on the basics of climate change, how climate can impact their business operations, and how businesses can take certain steps to improve their climate resiliency.
* CLEAResult’s engineers use information collected from site visits to identify GHG reduction opportunities. They help participants plan and strategize for capital improvement projects that save energy and reduce their greenhouse gas footprints. They summarize all the greenhouse gas reduction measures identified in the site visit into the Opportunity Register, customized to each participant's specific energy usage patterns and requirements.
* To clarify the potential benefits of the proposed GHG reduction opportunities, CLEAResult’s engineers and decarbonization experts perform high-level energy and cost calculations, package them for the organization to make it easy to understand the potential benefits of decarbonization and share plans with organizational leadership and energy champion teams.
* Participants who make strides towards reducing both energy and GHG emissions receive support conducting lifecycle assessments of their essential products to determine GHG emissions of a product or service from cradle-to-grave. CLEAResult’s decarbonization experts work with them to develop strategies for reducing their energy usage and GHG emissions by understanding their process for producing their various products.

CLEAResult will offer program participants CLEAResult’s ATLAS (“ATLAS Carbon”) Carbon™– a platform that brings together climate change, sustainability, environment, and risk tracking to estimate GHG footprints for ESG and financial reporting. ATLAS Carbon is a fully integrated emissions and sustainability reporting solution, covering data collection, calculation, data analytics, and regulatory and voluntary reporting to support tracking and reporting of Scope 1, 2 and 3 emissions.

CLEAResult will promote understanding of GHG emissions reduction and help organizations achieve both their EE and GHG reduction goals.

## Metrics

The program will be assessed by several measurable key performance indicators. These include the following:

* Total System Benefit
* Gross and Net Savings Goal Attainment –kWh, kW and therms
  + All Participants
  + Disadvantaged Communities (DAC)
  + Hard-to-Reach (HTR) Markets
* Project Pipeline Target Savings – kWh, kW and therms
* GHG Reduction Attainment
* Schedule Adherence – Projects committed vs installed vs forecasted
* Cost per unit Saved - Levelized cost of energy efficiency per kWh, kW, and therms
* Customer Satisfaction Rating
* Safety Rating
* HTR and DAC total participants

The Program will adhere to all guidance outlined in the most recent version of the California SEM M&V Guide, linked in Section C.

## For Programs Claiming To‐Code Savings

The equipment and controls’ performance degrade over the life of the equipment. The to-code program incentives will help the customers in restoring the performance of the equipment and controls to the rated performance. The to-code savings potential mainly resides in all the retro-commissioning measures, and behavioral and retro-commissioning sub-measures part of the SEM measures. The to-code potential is also available in all the non-code compliant equipment and controls installed by the customers due to financial restrictions and unawareness of energy efficiency benefits. As an example, the customers do not install variable speed controls on potential modulating load applications in the absence of the program incentives. Therefore, to-code potential also resides in the modulating load equipment/applications with constant speed controls and below code efficiency equipment.

The to-code potential resides both in the non-code compliant lighting and HVAC equipment and controls under all the building types, customer segments and geographical locations of the program scope. However, the measures will be cost-effective depending upon equipment loading, existing efficiency and hours of operation. There may be weather dependent measures, which will be more cost-effective in hotter climate zones.

The typical barriers that prevent code-compliant equipment replacements are:

* Lower initial capital costs of lesser efficient equipment
* Unaware of utility program incentives
* Unaware of code requirements
* Lack of awareness on energy efficiency, its alternatives and associated lifetime energy savings
* Unaware of OBF and alternative state financing plans
* Lack of understanding of non-energy benefits of higher efficiency measures

Natural turnover will not occur in certain markets for a variety of reasons, but as this applies specifically to the Local Commercial SEM program and facility types eligible to participate, the most significant barrier is access to expertise. Market actors in the commercial sector are often unstaffed, underfunded, and lack the technical expertise to effectively execute an energy efficiency plan.

The program interventions that would effectively accelerate equipment turnover are:

* Program incentives
* Aware of life-time energy efficiency savings’ benefits
* Third party implementer’s site assessment and identification of potential energy efficiency opportunities
* Third party implementer guidance on available energy efficiency alternatives and selection of most-efficient energy option
* Aware of non-energy benefits of measures including reduced maintenance and longer equipment life

## Pilots

Not applicable

## Workforce Education & Training (WE&T) [[1]](#footnote-2)

N/A for resource programs.

## Workforce Standards[[2]](#footnote-3)

The Local Commercial SEM Program design/implementation aligns with established rules for workforce standards (D.18-10-008). The program design requires that participating customers comply with D.18-10-008 workforce standards with their staff or through contractors they hire. Participants will receive training and education on acceptable HVAC technician credentials and California Advanced Lighting Controls Training Program (CALCTP) requirements for lighting vendors to maintain good standing.

CLEAResult will collect information on contractors used for each incentivized project that meets D.180-10-008's minimum criteria for workforce standards. To track compliance, the program will collect data on each project pertaining to technician name, phone, email, required licenses, year of experience, and evidence of qualifying credentials with expiration date. For HVAC projects with incentives exceeding $3,000, the program will ensure that technicians performing the work meet at least one of the following criteria:

1. Completed an accredited HVAC apprenticeship.
2. Is enrolled in an accredited HVAC apprenticeship.
3. Completed at least five years of work experience at the journey level according to the Department of Industrial Relations definition, Title 8, Section 205, of the California Code of Regulations, passed a practical and written HVAC system installation competency test, and received credentialed training specific to the installation of the technology being installed.
4. Has a C-20 HVAC contractor license issued by the California Contractor’s State Licensing Board.

For projects involving advanced lighting control measures where the incentive exceeds $2,000, each technician shall be certified by the CALCTP.

Projects will be screened for 100% compliance with D.180-10-008.

The SEM curriculum is enhanced with embedded Workforce Education and Training into existing curriculum with the objective of connecting course content directly to utility incentive programs. This will provide the opportunity for students to acquire the job skills needed to create immediate transfer opportunities into the energy industry workforce.

## Disadvantaged Worker Plan:[[3]](#footnote-4)

The Local Commercial SEM program doesn’t involve the direct installation of EE measures and is therefore not in a position to directly improve access to career opportunities for Disadvantaged Workers. However, the SEM curriculum is enhanced with embedded Workforce Education and Training into existing curriculum with the objective of connecting course content directly to utility incentive programs. This will provide the opportunity for workers to acquire certain job skills needed to for continued growth and development in the energy industry workforce. Participation in the SEM program allows employees to engage with industry professionals and learn new ways to approach their roles. These skills can lead to additional benefits, including promotions, within and external to, organizations. The program will also provide referrals for technicians and trade allies to applicable local and statewide workforce education and training resources.

Additionally, the Program anticipates serving businesses in DACs identified by CalEnviroScreen 4. The Program anticipates developing many energy savings projects, which will be implemented by these businesses as well as engineered, designed, and installed by local contractors employing disadvantaged workers. Through potential trade ally and vendor outreach and training, CLEAResult will promote career opportunities for disadvantaged workers and prioritize support for those who build tactics into their business model to support these workers. CLEAResult will track the participation of Disadvantaged Workers among participating program allies using CLEAResult’s digital platform. Each program ally’s record in the platform will include a field to record the number of Disadvantaged Workers that are employed. CLEAResult will annually survey participating program allies to enumerate and report on workers employed who meet the Disadvantaged Worker criteria:

* Household total income <50 percent of area median income
* A recipient of public assistance
* Lacks a high school diploma or GED
* Previous history of incarceration lasting one year or more
* A custodial single parent
* Previously chronically unemployed
* Aged out or emancipated from the foster care system
* Limited English proficiency
* Lives in a ZIP code in the top 25 percent of the unemployment indicator of the CalEnviroScreen Tool

Because program allies do not collect such information about their employees, we will provide them with a survey that they can share with staff to complete on a voluntary basis. The program will provide any Disadvantaged Worker information we collect to SCE on an annual basis noting the following:

* Number of new employees
* Number of job promotions
* Number of disadvantaged workers as defined by CPUC
* Partnership and/or employment goals and results from partnering with training or apprenticeship programs such as community colleges

## Additional Information

As described above, the program will adhere to all guidance outlined in the most recent version of the California SEM Design Guide, linked in Section C.

The following is a summary of the elements contained in the Design Guide, broken down by the three cycles. According to the California SEM Design Guide For: Cycle 1, 2, and 3 Section 3.1;

All cycles are broken down into four six-month “phases” and the phases are numbered sequentially through all three cycles. Activities, both educational and site-specific, are presented in a phase and meant to be completed within the six-month window for that phase and in the sequence outlined.” Refer to section 3.1 in the guide for the full description. Changing the sequence or timing of educational or site-specific activities is not recommended but it is ultimately the responsibility of the program administrator to approve and document any suggested changes in any special cases. Examples or cases where a change in sequence could be considered include highly seasonal participants (e.g., food processors), or a participant experiencing a dramatic event (e.g., temporary site shut down). Acceleration of specific activities or tasks (e.g., EMIS, employee awareness, operational controls) that may be of special interest to the PA or SEM Coach, either within a cycle or between cycles, is allowed but care should be taken to understand the impact to the overall design.

**SEM Cycle 1 Overview and Sequence**

Cycle 1 is critical in that it sets the customer’s expectations and understanding of the program as well as their experience with an energy management system, not only for this first Cycle, but for the customer’s entire potential six-year engagement. Cycle 1 sets the technical, educational, and inspirational foundation that the other cycles will rely on.

As mentioned earlier, it is important that the sequence in Cycle 1 be followed as the design is meant to ensure that early in the program customers:

1. Both at the executive and energy-team level, understand and commit to the program and Cycle 1 structure, approach, goals, and expectations. This includes an understanding of the objectives of each of the three cycles.

2. Realize low-effort and low-cost savings so that the customer’s commitment is positively reinforced with cost-effective savings while identifying projects for future implementation.

3. Gain practical experience that can be used later to develop and improve business practices.

Phase 1 begins the participants’ journey with the SEM program and starts to build the relationship between the participant and the program staff as well as between the various participants in the cohort (if being implemented in a cohort delivery approach). During this phase expectations, roles, and timing should be clearly defined and any potential issues should be identified.

Table

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**SEM Cycle 2 Overview and Sequence**

Cycle 2 focuses on deepening savings and engaging a broader circle of employees. It builds on the experience developed in Cycle 1 to expand beyond the initial core of employees. This cycle helps customers work with a broader number of employees and ensures there is management commitment, employee awareness and operator competence. Processes begin to get defined and documented so they can be repeated. Energy savings focus is on more complex opportunities that may require more resources (financial or human) and broader involvement from employees outside the energy team than those opportunities that were the focus in Cycle 1. Management commitment becomes critical in this Cycle to ensure the resources are available to meet the site’s objectives.

By the end of this cycle, the customer should be able to begin to lead their technical business practices with decreasing support from the SEM Coach.

Similar to Cycle 1, the sequence presented in the table below should be followed in order from top to bottom. This means, for example, that Site-Specific Activities #1 and #2 (Kick-off Meeting, Year 3 and EMA, Year 3) are completed before Educational Modules #1, and #2.

Table

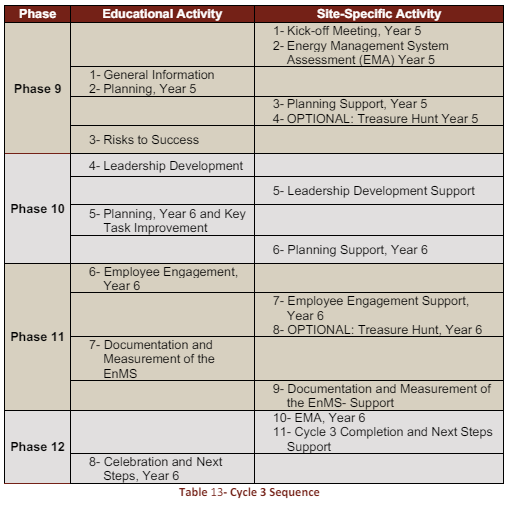
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**SEM Cycle 3 Overview and Sequence**

Cycle 3 focuses on locking in business practices so the customer can continuously improve energy performance and their EnMS beyond their engagement with the SEM program. Cycle 3 ensures that top management, the Energy Team, and the site’s staff have the commitment and processes to continually manage and improve the system’s performance.

By the end of this cycle, the customer’s business practices should be customer-led rather than SEM Coach-led.

Changing the sequence of educational or site-specific activities is not recommended but it is ultimately the responsibility of the program administrator to approve any suggested changes. As mentioned earlier, specific cases may call for changes in either the timing or sequence of activities. Similar to Cycle 1, the sequence presented in the table below should be followed in order from top to bottom. This means, for example, that Site1371 Specific Activities #1 and #2 (Kick-off Meeting, Year 5, and EMA, Year 5) are completed before Educational Modules #1, and #2.



# Supporting Documents

## Program Manuals and Program Rules

A summary of the program process and rules are described below. As required, a complete program manual will be uploaded in the California Energy Data and Reporting System (CEDARS). The manual clarifies the eligibility requirements and rules of the program for implementers and customers. Program rules will comply with CPUC policies and rules.

The Local Commercial SEM Program will adhere to the guidance set forth in the most recent versions of the [California SEM Design Guide (v 1.01)](https://pda.energydataweb.com/api/view/2647/CA_3_CYCLE_SEM_Design_Guide_V1.01.pdf) and the [California SEM M&V Guide (v 3.02)](https://pda.energydataweb.com/api/view/2648/CA_SEM_MV_Guide_v3.02.pdf) linked here.

**Eligible Measures**

The Local Commercial SEM Program will focus on the whole building/whole facility approach to capture and report all savings though the SEM pathway. However, enrolled participants can also take advantage of other measures, summarized in the “Incentive Tables, Workpapers, and Software Tools” section of this Implementation Plan. This list includes, but is not limited to, the following categories:

* Commercial refrigeration
* Heating, Ventilation, and Air Conditioning (HVAC)
* Commercial ovens
* Demand Control Ventilation (DCV)
* Economizer
* Steam Traps
* Water Heaters
* Controls
* Comprehensive retrofits
* Behavioral, Retro commissioning, and Operational (BRO)

**Customer Eligibility Requirements**

Customers served by the program must directly take or receive electricity services from within SCE’s service territory and pay the Public Purpose Program (PPP) surcharge on their utility bill. Eligible customers conduct business under a NAICS Code included below which broadly covers sites that are wholesalers, retail, warehousing, office buildings, healthcare and entertainment.

|  |  |  |  |
| --- | --- | --- | --- |
| Sector | Segment | NAICS Code | Description of Segment |
| Commercial | Wholesale Trade | 42 | Merchant wholesalers of durable and nondurable goods |
| Commercial | Retail Trade | 44, 45 | Retailers, dealers and suppliers of various products, including food and beverage stores. |
| Commercial | Transportation and Warehousing | 48, 49 | Businesses supporting multimodal transportation, storage and warehousing of goods and people. |
| Commercial | Information | 51 | Information and media services including motion picture production and sound recording, broadcasting, telecommunications, data processing, and other information services |
| Commercial | Office | 52, 53, 54, 55, 56 | Financial and insurance services, real estate and leasing services, scientific and technical services, and management of companies and enterprises |
| Commercial | Educational Services | 61 | Non-public educational services |
| Commercial | Health Care | 62 | Hospitals, social assistance, ambulatory services, and nursing and residential care facilities |
| Commercial | Arts, entertainment and recreation | 71 | Amusement, gambling, and recreation facilities, including theaters, stadiums, museums and historical sites |
| Commercial | Accommodation and food services | 72 | Restaurants, food services, drinking places, and lodging, including hotels and motels |
| Commercial | Miscellaneous | 81 | Laundry services, repair and maintenance services, religious organizations, houses of worship, non-profits |

**Contractor Eligibility Requirements**

N/A

**Participating Contractors, Manufacturers, Retailers, Distributors, and Partners**

Not applicable.

**Additional Services**

Not applicable

**Audits**

Facility assessments and scoping audits, as part of the SEM Treasure Hunt process, either in-person or virtual as conditions dictate and performed by a CLEAResult team member or partner with the appropriate clearances, will be tailored to the participant’s business needs, building characteristics and existing energy efficiency knowledge. Data gathered during these assessments allow CLEAResult to confirm recommended project potential, identify the appropriate incentive or energy management track, and increase program influence. There are no funding or direct incentives offered to customers for audits within The Program.

See California SEM Design Guide, linked in Section C, for Treasure Hunt procedures.

**Quality Assurance Provisions**

Key components of CLEAResult’s Quality Assurance/Quality Control (“QA”/”QC”) process are:

* Provide clear specifications by measure for work to be completed
* Train participating customers, contractors and utility staff on the specifications
* Teach contractors how this approach can improve their quality and increase profitability
* Secure formal commitment from customers through the Participation Agreement to adhere to specifications.
* Review and provide input on each contractor’s QC process.

CLEAResult has implemented a collaborative and stringent internal tracking and quality control process that all of the technical and editorial work follows. This process includes detailed technical development journals, internal technical review and signoff at the baseline and savings measurement periods. CLEAResult also holds regular internal and external collaboration meetings to discuss progress and address any potential barriers to success. CLEAResult documents and updates statistical models and report tracking as projects progress to ensure the program meets milestones and status is available to all team members working on the project.

In addition to CLEAResult’s comprehensive Quality Management Process, CLEAResult employs SEM specific QA/QC. To maintain the highest quality standards, CLEAResult utilizes a centralized SEM Data Analytics Center of Excellence (“DACoE”) with specialized statistical and data analysts that perform rigorous tests on the raw data and statistical models to ensure accuracy and compliance with local and international regulations. The SEM DACoE has completed over 3,000 energy models for commercial and industrial participants across North America. CLEAResult inspects data upon receipt from the customer and utility before being processed. Ensuring energy models are measuring savings as expected, the models go through formal review when the baseline regression is completed, 6 months through the program, and again at the close of each program year. The models are also reviewed on a monthly basis with the participant to ensure they are an accurate representation of facility operations and savings measures.

The program delivers customized modeling and calculations that follow best practices outlined in the California SEM M&V guide. As the customer engages in the program, CLEAResult’s primary approach shall proceed to generate a customized facility specific energy performance methodology through an energy consumption model described commonly as a top-down approach. Through the course of program participation, the CLEAResult team informs the customer and SCE staff on progress in implementing energy improvements and proceeds to capture the energy savings within the modeling top-down methodology.

When the top-down approach is not feasible, a conforming aggregated quantitative energy savings of the customer’s energy performance improvement activities shall be captured through a bottom up-approach. While the modeling approach is preferred and will remain as number one option, CLEAResult is prepared, qualified and highly experienced to perform engineering project calculations for SEM participants where the modeling approach does not meet the quality standards. CLEAResult engineering rigor for SEM projects will reflect engineering quality required and specified by the M&V guide dependent on quantity of savings, techniques, and methodologies used.

The program approaches quality assurance and quality control through reviews of technical appropriateness, proper measure type, actionability, feasibility, savings estimation plan in place, formatting, and documentation available for review upon request. Each CLEAResult engineer reviews their own work against the quality criteria, which then is approved by a SEM calculation certified reviewer to provide recommendations and revisions for the engineer to incorporate before the calculation is issued for external review including SCE staff and CPUC Commission Staff reviewers.

certified reviewer to provide recommendations and revisions for the engineer to incorporate before the calculation is issued for external review including SCE staff and CPUC Commission Staff reviewers.

CLEAResult’s approach to the required level of rigor for inspection and verification of savings will follow the pre and post inspection recommendations outlined in Annex D of the CA SEM M&V Guide matching the energy savings range and thresholds guidance (Categories A, B, C, and D). While every effort is made to follow these guidelines, real world situations can arise where information is not available or readily obtainable. CLEAResult will recommend viable alternative solutions and pathways. CLEAResult will collaborate with the SCE team to outline a mutually acceptable alternative approach with the best available substitute and reasonably obtainable information. The program’s approach to incorporating corrective actions are as follows:

CLEAResult’s analysts and engineers excel at developing and refining cost-effective measure mixes, while CLEAResult operations teams lead a streamlined, industry-leading approach to delivery that maximizes customer satisfaction in compliance with SCE, SEM, and CPUC requirements. Drawing on this expertise, CLEAResult will work closely with SCE to explore any proposed or mandated corrective scenarios that will impact customers.

**Other Program Metrics**

See Section B.5 Metrics

## Program Theory[[4]](#footnote-5) and Program Logic Model[[5]](#footnote-6)

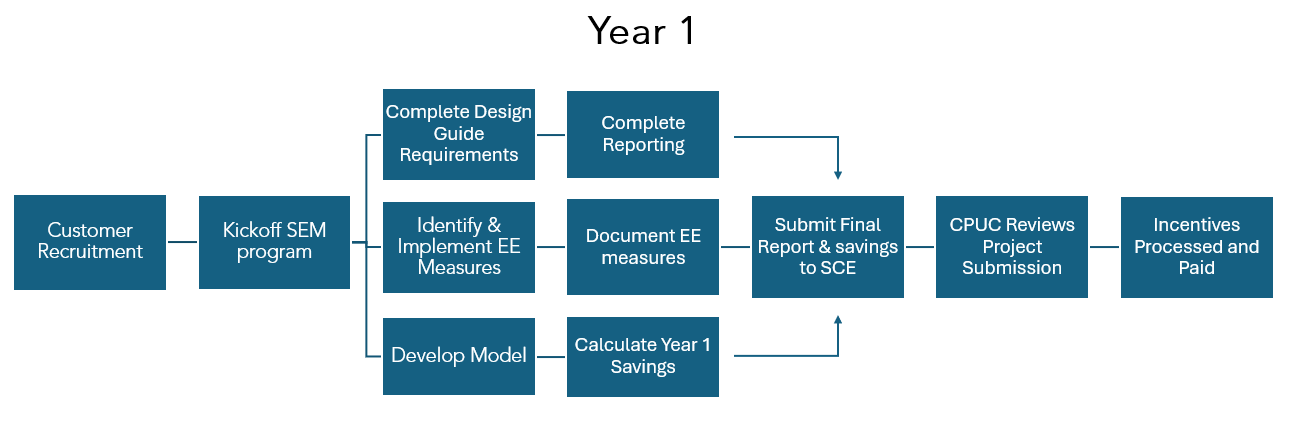
|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Local Commercial SEM Program Logic Model | | | | | |
| Barriers | Confusing program offerings and complex processes | Lack of Technical Expertise | Rigid financing and procurement hurdles | Lack of institutional commitment | Diverse sector is difficult to serve cost effectively |
| Activities | Single point of contact with dedicated SEM coaches | Technical assistance, onsite or virtual assessments | Integration of direct incentives, on-bill financing, and alternative funding | Clear communication of expectations and recruitment of executive sponsor | Regionally  focused outreach  with continuous  enrollment opportunities |
| Output | Reduced market confusion | Project Opportunities Identified | Flexible participation options yielding net positive economic benefits | Customer program/project champion identified | SEM participants will be able to enroll in the program on their timelines |
| Short Term Outcomes | Greater program interest and improved customers satisfaction | Low-cost behavioral and operational savings | | Clear communication of support for participation across customer functions | Enhanced program enrollment |
| Intermediate Outcomes | Improved project conversion rate | Meter-based incentive unlock additional savings potential | | Tracking and M&V show clear progress and benefits | Cohort participants share best practices |
| Long Term Outcomes | Improved cross-cutting participation through IDSM support | Expansion of DR-enabled technologies and equipment drive expansion of IDSM in the sector | | Program recommendations established as policy and standard practice | Participants incorporate best practices from across the commercial sectors |

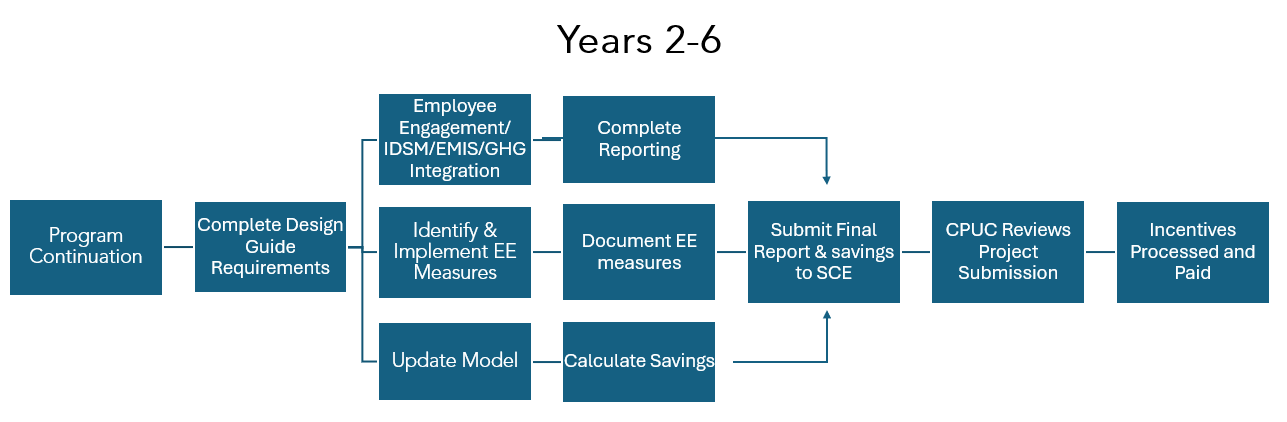
**SEM Offering Theory & Logic Model**

Diagram

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## Process Flow Chart





**Cycle Concept and Overview:**

SEM is designed as a six-year curriculum broken down into three, two-year cycles. The three-cycle approach can be thought of as an overall journey of six years with three discreet steps that lead a participant from a basic level of ability to understand and manage energy in Cycle 1, to a moderate level of ability in Cycle 2, to an advanced level in Cycle 3. Each of the cycles builds upon the knowledge and experience gained in the last cycle, with the end goal of the third cycle being a participant that can manage and save energy with limited or no program support.

A diagram of energy management

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All cycles are broken down into four six-month “phases” and the phases are numbered sequentially through all three cycles.

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Activities, both educational and site-specific, are presented in a phase and meant to be completed within the six-month window for that phase and in the sequence outlined. Changing the sequence or timing of educational or site-specific activities is ultimately the responsibility of the program administrator to approve and document any suggested changes in any special cases. Examples or cases where a change in sequence could be considered include highly seasonal participants (e.g., food processors), or a participant experiencing a dramatic event (e.g., temporary site shut down). Acceleration of specific activities or tasks (e.g., EMIS, employee awareness, operational controls) is allowed with the approval of SCE.

Refer to Section B.11 for process flow for program delivery for all six years of the program.

This process flow chart applies to the Custom and Deemed incentive pathways within SEM.

A diagram of a project

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## Incentive Tables, Workpapers, Software Tools[[6]](#footnote-7)

CLEAResult’s approach to incentive design is consistent with the best practice guidance presented in D.18-05-041, including aligning incentives with lifecycle savings, promoting increasing degrees of efficiency, considering the barrier variation of different customers, and aligning payments with annual monitoring for performance-based approaches. CLEAResult’s incentive structure also responds to two other best practices used by CLEAResult nationwide: 1) keep things simple and understandable for the customer, and 2) use incentives to maximize grid benefits.

CLEAResult proposes two types of participant incentives:

* Milestone incentive payments: Milestone incentives will be paid to customers based on progress made in the program, primarily for meeting deadlines for providing energy and other relevant variable data.
* Performance incentive payments: Performance incentives will be paid to customers based on energy savings calculated through the energy consumption adjustment model.

Milestone incentives are paid throughout Cycle 1 based on the customer’s ability to meet deadlines and criteria. There are five milestones paid throughout Cycle 1. Payment for meeting each milestone will be:

|  |  |  |  |
| --- | --- | --- | --- |
| **#** | **Measure** | **Incentive Level** | **Comment** |
| **1** | Milestone: Initial - Energy and Relevant variable Data and Workshop Attendance | $2,000/participant | 1/participant |
| **2** | Milestone: Subsequent: Updated Data and Opportunity Register | $1,000/participant | 4/participant (Maximum of $4,000 in cycle) |
| **3** | Performance | $0.05/kWh |  |
| **4** | Custom | $0.12/kWh |  |
| **5** | Custom | $150/peak demand kW |  |

The table below lists the associated workpaper name, description, and location for the approved measures and may be updated throughout the course of the program. Deemed and Custom measures will be pursued with customers when those project timelines and goals are aligned with higher incentive options and it is in the customers best interest. Savings will be netted out of SEM modeled savings as described in section C.7.

|  |  |  |  |
| --- | --- | --- | --- |
| **#** | **Measure Package Name** | **Short Description** | **URL link or location name** |
|  | SWHC020-03 | Air-Cooled Chiller | Measure Catalog | ETRM (caetrm.com) |
|  | SWHC052-02 | Air-Cooled Chiller, Path B | Measure Catalog | ETRM (caetrm.com) |
|  | SWCR001-03 | Anti-Sweat Heater Controls | Measure Catalog | ETRM (caetrm.com) |
|  | SWFS017-02 | Automatic Conveyor Broiler, Commercial | Measure Catalog | ETRM (caetrm.com) |
|  | SWCR010-03 | Bare Suction Line Insulation | Measure Catalog | ETRM (caetrm.com) |
|  | SWWH005-06 | Boiler, Commercial | Measure Catalog | ETRM (caetrm.com) |
|  | SWPR004-03 | Circulating Block Heater | Measure Catalog | ETRM (caetrm.com) |
|  | SWHC024-03 | Cogged V-Belt for HVAC Fan, Commercial | Measure Catalog | ETRM (caetrm.com) |
|  | SWFS003-03 | Combination Oven, Commercial | Measure Catalog | ETRM (caetrm.com) |
|  | SWFS010-02 | Commercial Hand-Wrap Machine, Electric | Measure Catalog | ETRM (caetrm.com) |
|  | SWCR012-02 | Compressor Retrofit, Multiplex | Measure Catalog | ETRM (caetrm.com) |
|  | SWFS001-03 | Convection Oven, Commercial | Measure Catalog | ETRM (caetrm.com) |
|  | SWFS022-02 | Convection Oven, Commercial, Fuel Substitution | Measure Catalog | ETRM (caetrm.com) |
|  | SWFS026-01 | Cooktop, Commercial | Measure Catalog | ETRM (caetrm.com) |
|  | SWWH015-03 | Demand Control for Centralized Water Heater Recirculation Pump, Multifamily & Commercial | Measure Catalog | ETRM (caetrm.com) |
|  | SWHC006-02 | Demand Control Ventilation for Single Zone HVAC | Measure Catalog | ETRM (caetrm.com) |
|  | SWFS002-03 | Door-Type Dishwasher, Commercial | Measure Catalog | ETRM (caetrm.com) |
|  | SWSV010-02 | Economizer Controls, Commercial | Measure Catalog | ETRM (caetrm.com) |
|  | SWSV005-02 | Economizer Repair, Commercial | Measure Catalog | ETRM (caetrm.com) |
|  | SWCR022-03 | Efficient Adiabatic Condenser | Measure Catalog | ETRM (caetrm.com) |
|  | SWWP005-03 | Enhanced Variable Frequency Drive on Irrigation Pump | Measure Catalog | ETRM (caetrm.com) |
|  | SWHC023-03 | Enhanced Ventilation for Packaged HVAC | Measure Catalog | ETRM (caetrm.com) |
|  | SWHC042-03 | Evaporative Pre-Cooler System and Controls for Packaged HVAC Unit | Measure Catalog | ETRM (caetrm.com) |
|  | SWFS012-01 | Exhaust Hood Demand Controlled Ventilation, Commercial | Measure Catalog | ETRM (caetrm.com) |
|  | SWCR003-02 | Fan Motor Retrofit for a Refrigerated Display Case | Measure Catalog | ETRM (caetrm.com) |
|  | SWCR007-04 | Floating Head Pressure Controls, Multiplex | Measure Catalog | ETRM (caetrm.com) |
|  | SWCR008-03 | Floating Suction Controls, Multiplex | Measure Catalog | ETRM (caetrm.com) |
|  | SWFS011-05 | Fryer, Commercial | Measure Catalog | ETRM (caetrm.com) |
|  | SWFS021-03 | Fryer, Commercial, Fuel Substitution | Measure Catalog | ETRM (caetrm.com) |
|  | SWFS004-01 | Griddle, Commercial | Measure Catalog | ETRM (caetrm.com) |
|  | SWWH031-02 | Heat Pump Water Heater, Commercial | Measure Catalog | ETRM (caetrm.com) |
|  | SWWH027-03 | Heat Pump Water Heater, Commercial, Fuel Substitution | Measure Catalog | ETRM (caetrm.com) |
|  | SWFS024-01 | Hot Food Holding Bins, Commercial | Measure Catalog | ETRM (caetrm.com) |
|  | SWHC012-02 | HVAC Occupancy Sensor, Classroom | Measure Catalog | ETRM (caetrm.com) |
|  | SWFS006-02 | Ice Machine, Commercial | Measure Catalog | ETRM (caetrm.com) |
|  | SWFS007-03 | Insulated Hot Food Holding Cabinet | Measure Catalog | ETRM (caetrm.com) |
|  | SWWH028-02 | Large Heat Pump Water Heater, Commercial and Multifamily, Fuel Substitution | Measure Catalog | ETRM (caetrm.com) |
|  | SWCR019-02 | Low-Temperature Coffin To Reach-In Display Case Conversion | Measure Catalog | ETRM (caetrm.com) |
|  | SWCR002-03 | Low-Temperature Display Case Doors With No Anti-Sweat Heaters | Measure Catalog | ETRM (caetrm.com) |
|  | SWCR014-03 | Medium or Low-Temperature Display Case | Measure Catalog | ETRM (caetrm.com) |
|  | SWCR021-02 | Medium or Low-Temperature Display Case With Doors | Measure Catalog | ETRM (caetrm.com) |
|  | SWCR015-02 | Medium-Temperature Case Doors | Measure Catalog | ETRM (caetrm.com) |
|  | SWCR020-03 | Medium-Temperature Open Display Case Retrofit | Measure Catalog | ETRM (caetrm.com) |
|  | SWHC043-03 | Multiple Capacity Unitary Air-Cooled Commercial Air Conditioners Between 65 and 240 kBtu/hr | Measure Catalog | ETRM (caetrm.com) |
|  | SWAP005-02 | Ozone Laundry, Commercial | Measure Catalog | ETRM (caetrm.com) |
|  | SWHC046-02 | Packaged Heat Pump Air Conditioner Commercial, Fuel Substitution | Measure Catalog | ETRM (caetrm.com) |
|  | SWHC027-03 | Package Terminal Air Conditioner or Heat Pump, Under 24 kBtu/hr | Measure Catalog | ETRM (caetrm.com) |
|  | SWFS025-01 | Radiant Conveyor Toaster, Commercial | Measure Catalog | ETRM (caetrm.com) |
|  | SWCR018-03 | Reach-In Refrigerator or Freezer, Commercial | Measure Catalog | ETRM (caetrm.com) |
|  | SWFS016-02 | Refrigerated Chef Base | Measure Catalog | ETRM (caetrm.com) |
|  | SWHC041-04 | Software-Controlled Switch Reluctance Motor | Measure Catalog | ETRM (caetrm.com) |
|  | SWWH034-02 | Solar Thermal Water Heating System, Commercial and Multifamily | Measure Catalog | ETRM (caetrm.com) |
|  | SWFS027-01 | Soup Well, Electric, Commercial | Measure Catalog | ETRM (caetrm.com) |
|  | SWFS005-03 | Steamer, Commercial | Measure Catalog | ETRM (caetrm.com) |
|  | SWFS028-01 | Steam Table, Electric, Commercial | Measure Catalog | ETRM (caetrm.com) |
|  | SWWH007-05 | Storage Water Heater, Commercial | Measure Catalog | ETRM (caetrm.com) |
|  | SWHC009-03 | Supply Fan Controls, Commercial | Measure Catalog | ETRM (caetrm.com) |
|  | SWWH006-07 | Tankless Water Heater, Commercial | Measure Catalog | ETRM (caetrm.com) |
|  | SWCR017-04 | Ultra-Low Temperature Freezer | Measure Catalog | ETRM (caetrm.com) |
|  | SWLG020-01 | UL Type B LED Mogul Base Lamp HID Retrofits for Outdoor Area/Pole and Decorative Fixtures | Measure Catalog | ETRM (caetrm.com) |
|  | SWFS018-04 | Undercounter Dishwasher, Commercial | Measure Catalog | ETRM (caetrm.com) |
|  | SWHC014-03 | Unitary Air-Cooled Air Conditioner or Heat Pump, Under 65 kBtu/hr, Commercial | Measure Catalog | ETRM (caetrm.com) |
|  | SWHC013-03 | Unitary Air-Cooled Air Conditioner, Over 65 kBtu/hr, Commercial | Measure Catalog | ETRM (caetrm.com) |
|  | SWWP002-03 | Variable Frequency Drive on Irrigation Pump, <=300 hp | Measure Catalog | ETRM (caetrm.com) |
|  | SWHC008-01 | Variable Speed Drive for a Central Plant System | Measure Catalog | ETRM (caetrm.com) |
|  | SWAP011-03 | Vending and Beverage Merchandise Controller | Measure Catalog | ETRM (caetrm.com) |
|  | SWCA001-03 | VFD Retrofit for Air Compressor | Measure Catalog | ETRM (caetrm.com) |
|  | SWHC018-03 | VSD for HVAC Fan Controls, Commercial | Measure Catalog | ETRM (caetrm.com) |
|  | SWHC005-03 | Water-Cooled Chiller | Measure Catalog | ETRM (caetrm.com) |
|  | SWMI001-02 | Water Energy Nexus Measures | Measure Catalog | ETRM (caetrm.com) |

**Software**

Statistical analysis and data analysis will be performed in statistical software packages and transferred to Excel for ease of customer use and for the program administration and CPUC teams to recreate calculated energy savings.

## Quantitative Program Targets

See Section A.4 “Program and/or Sub-Program Gross Impacts Table” and A.11 “Campaign Goals and Timeline.”

## Diagram of Program

A diagram of a program

Description automatically generated

## Evaluation, Measurement, and Verification (EM&V):

The SEM program implementation will follow the most recent version of the California SEM Design and M&V Guides (linked above) to deliver all data, calculations, and reporting required by the CPUC for their third-party evaluation. As outlined in the California SEM M&V Guide, all deliverables outlined in section 13 of that guide will be provided by the program implementor to the program administrator during the mid-year evaluation period for preliminary review by the program administrator. After review, the program implementation team will make any necessary modifications as needed for the program administrator to deliver to the CPUC for review.

Additionally, as outlined in the California SEM M&V Guide, all deliverables outlined in section 14 will be provided by the program implementor to the program administrator during the year end evaluation period for preliminary review by the program administrator. After review, the program implementation team will make any necessary modifications as needed for the program administrator to deliver a final package to the CPUC for review. During program implementation, the following section will be utilized to guide the program measurement and verification to meet the requirements of the most recent version of the California SEM M&V Guide.

Data collection will be performed within the boundaries of this IP, the SEM Design Guide, M&V Guide, and the confines of SCEs processes for delivering customer data to CLEAResult. Internal performance analysis will be compared to progress towards goals and completed at various times throughout the program to determine where changes are needed to meet the performance goals of the program.

**Program Measurement and Verification Guide Summary**

This M&V Guide Summary provides an overview of the energy efficiency program measurement and verification of energy savings from identified and implemented energy efficiency projects in order to meet the California SEM M&V Guide requirements. The guide describes the process and procedures for measurement and verification of these energy savings in each of the following (3) program platforms:

* Strategic Energy Management (SEM)
* Custom (SEM)
* Deemed (SEM)

Participants will have an option to participate in Custom and Deemed pathways as per allowance and requirement provided by CA SEM Guide.

**SEM M&V ACTIVITIES**

The primary objective of the M&V activities is to estimate the energy impacts of the SEM offering. This M&V plan provides information on the M&V activities including data collection, data analysis, adjustments, and reporting. The following flow chart provides a high‐ level overview for the major activities. The California SEM M&V Guides was utilized for reference to create this M&V plan and any updates to design guides will be incorporated into future M&V plans. The figure below shows the general process flow of SEM data collection and model creation. All SEM model creation and validation will follow the California SEM M&V Guide Version 3.02 as described throughout that guidance document.



**SEM Data Collection**

The program’s M&V approach is based on the California SEM M&V Guide Version 3.02. The guide defines the measurement boundary as the whole facility and requires measurement utilizing revenue grade meters; whole‐ building utility energy meters qualify as revenue grade meters. The program will also monitor static factors such as equipment and operations within the measurement boundary to identify if any non‐routine adjustments are required.

There are two types of data collection during the program. First, the team will collect energy data and other quantitative data to estimate the kWh and therm energy impacts of the program. Second, the team will track qualitative observations related to the SEM activities and feedback from participant buildings to inform the results of the quantitative assessment.

**Quantitative SEM Data Collection**

The table below outlines the data collection requirements for the participant sites. The program will review data on an ongoing basis to determine if any additional data or refinements are necessary.

**Data Collection Requirements for Participant Buildings**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Data Description** | **Desired Interval** | **Pre-SEM Data Collection** | **Post-SEM Data Collection** | **Data Source** | **Update Frequency** |
| Interval meter data (primary) | 15 min. kWh/therm | 1-2 years | Program duration | SCE, Green Button or Participant Records | Monthly |
| Monthly billing data (if interval is not available) | Monthly | 1-2 years | Program duration | SCE, Green Button or Participant Records | Monthly |
| Weather data | Daily | Covering the interval data timeframe | Program duration | Officially recognized internet weather data site(s) | Monthly |
| Participant business characteristics including address, business type, building age, major equipment, square footage, enrollment date, dates of behavioral intervention, and operating hours | Multiple | n/a | Program duration | CLEAResult and customer | Minimum – beginning of the program and once at the end ideal – monthly |
| Occupancy and operations data | Same as energy use date, if available | Same as energy use date, if available | Same as energy use date, if available | Customer records | Monthly or as needed |
| Customer ID, meter number(s), services address(es) | One time | n/a | n/a | Participant | Upon enrollment |
| Participation data from other programs, including dates and estimated savings of energy savings measures | During and the end of the NMEC measurement year | n/a | n/a | CLEAResult | Minimum - at beginning and end of measurement period Ideal – monthly |

**Equipment and Instrumentation**

No additional metering equipment is required at the participating sites but may be utilized if needed. For sites with existing interval meters, the program will use the corresponding interval data. For sites without interval meters the team will utilize monthly billing data. Customer‐owned submeters installed prior or during the SEM engagement may be used if the site is complex enough to warrant sub‐metering breakout or metering with revenue grade meters (as outlined in the IPMVP) to collect the necessary data.

**Qualitative SEM Data Collection**

In addition to meter data and other quantitative indicators of energy use, the program will collect data from the participants (the individual sites enrolled) to document energy efficiency awareness and practices before and during the program. Data collection is designed to capture any changes in production, owner and occupant behavior, attitude, or actions that affect energy consumption. Data will be collected from multiple points including regular feedback from energy champions, facility managers, self‐ reporting tools, and electronic and phone surveys.

The data collection will include documentation of:

* Production changes including production mix or addition of new products
* Schedule changes including shutdowns or unusual events
* Any retrofits or maintenance activities
* System setting changes such as set points and heating or cooling schedules
* Occupancy changes such as tenant, production, or staffing changes
* Specific questions regarding participating employees’ understanding of energy efficiency and any activities performed to save energy before the program
* Strategies the organization employed to save energy with the objective of identifying behavior changes and equipment upgrades
* Energy champion and executive sponsor responses when asked if they observed any other impacts on their operations, such as increased customer traffic or a change in overall employee engagement.
* Pre-planned projects outside the scope of the SEM engagement

The goal of the qualitative data collection is to help inform how much the program influences awareness and behavior. In addition, the qualitative data will provide context for the source of energy savings by telling a story with corroborating evidence about what activities led to the savings. Depending on the level of detail collected from participants, the program may be able to show resolution around what activities or actions happened within a specific timeframe that may correlate with a measurable drop in normalized energy intensity.

**SEM Data Analysis**

The boundary of all measures is the whole facility, which could mean a single facility or group of buildings depending upon available utility information. Statistical analysis will be done using statistical software and transferred into Excel for ease of use for participants. The following is an overview of the data analysis activities to estimate the energy impacts of the program:

* Identify available metering. As participants enroll into the program, they will need to identify what type of utility data (monthly or interval) is available, as this will determine what type of analysis will be performed.
* Assess baseline data for validity. As participants’ models are developed, the program will conduct an analysis to determine if adequate baseline data exists for the analysis and if any data is missing. If adequate data is not available, the CLEAResult team may make recommendations for additional data collection or alternative M&V approaches.
* As necessary, aggregate meter level data to business or site level data. Using the customer level ID or similar utility site identifier, the program will aggregate individual meters into whole businesses or whole building, as appropriate. In situations where the individual meters have misaligned meter read dates for similar monthly billing periods, the whole business or whole building meter level data will be aggregated based on the monthly billing periods from the individual meter with the largest energy consumption.
* Estimate program Energy Savings. The analysis will use an avoided energy use method where a baseline statistical model is created, ideally using two full years of monitored data prior to implementation. Then the actual monitored data recorded during the program are used in a standard least squared regression to create an adjusted baseline. The difference between the adjusted baseline and measurement period energy use is the avoided energy use, or the SEM energy savings, shown below:

*Avoided energy use (SEM Energy Savings)*

*Measurement period energy use - Baseline model prediction*

*± Non routine adjustments*

Based on this formula, SEM energy savings includes any activity, project, or change within the measurement boundary at a participant facility resulting in energy savings. There are several exceptions to projects captured within the measurement boundary that would not be allocated to SEM pathway savings:

* Energy projects incentivized through other SCE offerings
* Fuel switching (from electricity to natural gas)
* Installing alternative energy generation equipment such as solar, combined heat and power, wind, etc.

For all participants:

Preliminary modeling employing stepwise regression is used to evaluate the statistical significance of various independent variables in relation to energy usage. This is followed by successive manual changes to the model’s specification to identify a model with good predictive performance and a reasonable number of predictors given the sample size. The distribution of each variable in the model is examined for suitability in regression modeling. A time series plot of each variable is analyzed to identify trends and relationships between data sets. The strength of association between variables is evaluated using bivariate correlations as well as partial correlations and associated scatter plots.

The performance of the model is assessed through a variety of statistical measures including overall fit (R2), coefficient of variance, autocorrelation of the regression residuals, X-Y plot of actual vs. predicted values and a time series plot of actual vs. predicted values is superimposed. If necessary, CLEAResult will incorporate routine and non‐ routine adjustments to improve model performance (see adjustments section below).

The program reviews each model per CLEAResult’s internal QA/QC document, and reports the final:

* data issues,
* model specification,
* sign and significance (including t‐ statistic) of the coefficients,
* residual plots, and
* statistical metrics: R2, adjusted R2, F‐ ratio probability, sample size (N), ratio of N to predictors, first‐ order autocorrelation, CV/RMSE, net determination bias, and the maximum CUSUM as a percentage of annual energy use.

For participants with interval data:

The interval for the final model will be determined based on a combination of timing with concurrent program year, preference from the participant, and quality of the data at the chosen interval. To estimate the electric savings ordinary least‐ squares regression statistical technique will be used to create baseline models. Models will be created through investigating independent variables including production, dry bulb and wet bulb temperature, relative humidity, hours of operation, day of week, time of day, process loads, sales/transaction data, or occupancy. In addition, binary indicator variables informed by qualitative data collection will be considered where applicable. Step‐ wise regression analysis techniques will be used to iteratively compare all logical combinations of independent variables. Autocorrelation will be considered and tested to determine if the model autocorrelation will affect the final savings analysis.

For participants with monthly data:

In models where the billing period varies, the analysis may employ a weighted least‐ squares regression technique based on ASHRAE Guideline 14‐ 2014, section 2.3 for Day Adjusted Models.

Models will be created through investigating independent variables including, but not limited to, production, dry bulb and wet bulb temperature, relative humidity, hours of operation, day of week, time of day, process loads, sales/transaction data, or occupancy. In addition, binary indicator variables informed by qualitative data collection will be considered where applicable. All non‐ indicator variables will be divided by the number of days in the monthly billing period.

Depending on the actions taken by the participants with only monthly data available, there may not be high enough savings to provide a statistically significant measurement of savings using monthly data. Not all projects, however, require such a high level of statistical confidence in the savings. In these cases, the savings estimates using monthly data is the best option available and the program team will work to achieve the highest accuracy using all data available.

**SEM Model Validity**

Before energy baseline models are approved to track energy performance, they are subject to multiple reviews. The first review is performed by CLEAResult against a stringent set of statistical criteria and analysis listed below and as outlined in the California SEM M&V Guide Version 3.02; future revisions to the California SEM M&V guidelines will be utilized as appropriate.

|  |  |  |
| --- | --- | --- |
| **Overall SEM Model** | | |
| **Performance Statistic** | **Typical Limits** | **Explanation** |
| R2 | > 0.75 | The proportion of energy use during the baseline period can be explained by movements of the model’s predictors. An R2 of 0.95 means that 95% of period‐ to‐ period variations in energy use in the baseline period are explained by the model’s predictors. |
| Coefficient of Variance of RMSE | <0.2 | CV of RMSE is RMSE divided by average energy use over the baseline period. The lower the CV, the smaller the regression residuals (prediction errors) are relative to predicted energy. |
| Autocorrelation | <0.5 | Autocorrelation is a measurement (ranging from -1 to +1) of the serial correlation of regression residuals. High autocorrelation can cause a model to over-predict or underpredict for stretches of time and is more common in high frequency (e.g., daily) models. Autocorrelation leads to underestimated standard errors of the regression coefficients, so a model’s t-values need to be large (well above 2.0) to assure their relevance when autocorrelation is high (e.g., above 0.5). |
| Net Determination Bias | <0.005% | Net determination bias measures the model’s tendency to over‐ or under‐ estimate energy savings. |
| **SEM Model Predictors** | | |
| **Item** | **Typical Limits** | **Explanation** |
| t‐ stat | |t| > 2.0 | The ratio of a predictor’s estimated coefficient to its standard error. Large t‐ ratios (>2.0) suggest that the variable is a useful predictor. |
| p‐ value | p < 0.05 | Small p‐ values (<0.05) indicate a predictor is statistically significant (unlikely to be zero). |
| **SEM CUSUM Baseline** | | |
| **Item** | **Typical Limits** | **Explanation** |
| Maximum Variance (Daily/Weekly/ Monthly Models) | <|1%‐ 2.5%| | This maximum variation in the CUSUM during the baseline period shows the noise in the model baseline. This is a good indicator of the “sensitivity” of the model at detecting future changes (i.e., savings). While not all models would meet this guideline, if savings achieved by the site greatly exceeds the baseline noise, this method give a high confidence in the measured savings.  For instance, if the baseline variation is 3% but the site saves 8%, the savings trend will extend well outside the normal baseline and therefore savings can be claimed. If a model follows the typical limits of CUSUM variance, SEM savings can be easily detected even as low as 1.5 % savings. |

Valid hypothesis models will be prepared for review by the CPUC as they become ready and meet all statistical and engineering criteria outlined in the California SEM M&V Guide Version 3.02. In instances where there is a significant time delay in gathering utility or customer data, this timeline may be extended past the recommended timeline. SEM energy modeling is reliant on accurate data and customer and sometimes this data is difficult for customers to acquire which can result in significant delays in the modeling process; data delays can be the result of Green Button or participant supplied data. For example, if a participant is required to obtain a formal release to distribute business or Green Button data, that process can significantly delay data acquisition. A revised schedule for those participants can be prepared and reviewed with the CPUC and technical review staff.

Energy baseline models are also subject to review by the participant. During this, the participant is asked to examine the model to assure they understand how it works and to confirm that each predictor makes sense within the context of the site’s energy profile. Once the implementer and participant approve the model, it is then presented to SCE for review. SCE may want to engage a third party with statistical expertise, such as their evaluation contractor, to assist in this review.

**Anomalies / Adjustments for Energy Consumption Changes**

If significant changes are made to the site during the baseline and measurement periods, such as added/removed space, equipment, or changes to operations such as tenants moving in/out or production changes, the modelers will investigate ways to account for the effects of the change. Changes will be tracked throughout the program and incorporated in the model prediction where possible. If changes are large enough, they may warrant a re-baseline for the participant to incorporate the change in the energy model calculations.

If participants undergo an energy saving project incentivized through another SCE program, then reported realized savings from that project will be subtracted from the SEM savings in the energy model file. Additionally, any site savings that are pursued using the deemed or custom pathways will also be subtracted from the modeled savings in the same way as projects incentivized through other SCE programs. If a reported capital project appears to have been over- or under-estimated, the SEM team will review the project with the capital project implementation team to determine the accuracy of claimed savings. The program will receive periodic reports from CLEAResult project tracking on incentivized projects and associated savings calculations.

**Alternative Savings Analysis**

If the standard modeling method does not lead to an valid model (valid models are defined by the statistical criteria outlined in the California SEM M&V Guide Version 3.02; models may be abandoned as described in the California SEM M&V Guide Version 3.02) that meets the goals of calculating energy savings and providing feedback to the SEM participants, alternative modeling methods may be used to measure savings from the SEM pathway following the guidance in California SEM M&V Guide Version 3.02. Alternate modeling methodologies will be described in the M&V report for each participant where alternate modeling is required and will be presented during Technical Review. The following modeling methodology will be considered:

* Intervention step models
* Regression modeling over both the baseline and the measurement period, which allows changes that occur after the baseline period to be incorporated in the analysis.
* This method is used when a participant makes large or drastic changes during involvement with the SEM offering and the baseline time period cannot be compared to the measurement period.
* Mean model
* Applied when there is insufficient variation in the energy use at the site to create a standard regression model.
* Calculating Savings with the Opportunity Register
  1. If none of the other modeling methods produce a model capable of measuring savings at a site, the savings will be calculated with bottom-up savings analysis as described in California SEM M&V Guide Version 3.02.

**Non‐ IOU Fuel Source**

Per the California SEM M&V Guide Version 3.02, when any energy supplier other than the PA is involved (including solar and self‐generation), incentives are paid based only on the energy savings that are reflected on the electric grid or natural gas system. When an SEM participant utilizes a non‐IOU fuel source, a non‐IOU fuel source analysis will be performed in accordance with the most recent version of the California SEM M&V Guide.

**Claiming SEM Savings**

**SEM Energy Savings**

California has elected to assign a five‐year measure life for savings achieved through the SEM pathway. Facility-wide savings achieved will be shown graphically using a Cumulative Sum (CUSUM) graph, which sums the difference between the actual energy use and the predicted energy use over time. The diagram below illustrates how SEM savings will be quantified to determine program savings and incentive payments. These savings will be applied towards meeting SEM pathway goals and will be submitted to state regulators towards overall program energy reduction targets. Note that yearly savings are calculated from the original baseline set prior to a participant entering the program less any savings incentivized through other SCE programs (capital project savings), SEM incented project savings, and non-SEM pathway savings; incented savings will be any savings above that previously achieved by the participant. Removal of non-SEM energy savings is outlined in the California SEM M&V Guide Version 3.02.



For Year 1 – 90,862 kWh measured savings – 90,862 kWh claimed savings submitted to CPUC  
For Year 2 – 135,531 kWh measured savings – 44,669 kWh claimed savings submitted to CPUC  
For Year 3 – 263,757 kWh measured savings – 128,226 kWh claimed savings submitted to CPUC

**Negative SEM Savings**

Negative savings will be addressed in accordance to the California SEM M&V Guide Version 3.02

**SEM Results Reporting**

CLEAResult will maintain the energy models each year the program is offered and will prepare an annual report for each participant at the end of each program year which includes a copy of the final model with all raw data included. These reports will contain the data cleaning as outlined in section 6 of the California SEM M&V Guidelines v 3.02, baseline model, CUSUM graph, savings and incentives earned, statistical rational, and calculations. If a model is not viable, the report will contain the bottom-up savings analysis as described in California SEM M&V Guide Version 3.02 and will be submitted for technical review. Savings from the SEM initiative will be reported under the SCE energy efficiency program.

In addition to the annual reports, CLEAResult will provide monthly progress reports, as models become available, summarizing savings achieved for each participant, and for the program. Progress reports will be obtained by reviewing the energy models. Given that the energy models are dynamic and subject to change and constant updates, progress reports should be viewed as approximation of savings. Progress reports will be available sometime after the start of the program when energy models have been developed, or reset, and are actively being updated.

**Custom M&V Activities within the SEM program**

Custom Project Incentives – Qualification

The Custom Project Incentive Qualification steps below generally inform how the program will determine if a project qualifies. Customers of the Local Commercial SEM program can pursue custom projects while participating in SEM. These steps are not intended to be all-inclusive or applicable to all aspects of a project; rather, this protocol will guide field staff to ask the necessary questions and gather the appropriate data to qualify custom projects. This protocol references the International Performance Measurement and Verification Protocol (IPMVP), which is the primary standard for M&V activities in most jurisdictions.

Every Custom project will include an Engineering Review Form which outlines the scope of work, methodology, assumptions, measure life, and technical contact information required for evaluation.

Formal M&V reports will be developed to document and verify all pre-approved and implemented custom projects. M&V reports will follow the IPMVP standard. Responsibility for M&V Plans and Options lies with the participating Customer, with instructions and direction from CLEAResult (Program Implementer).

Custom projects shall adhere to guidance documents outlined in the CPUC Custom Projects Review Process, which incorporates details on the Commission’s policies and procedures to be utilized in the development of custom projects & measures. Each custom project measure application shall be reviewed to be in compliance with guidance provided in the Statewide Custom Project Guidance Document (version 1.4, as of 6/02/2021) to assure M&V activities meets the expectations of a complete, quality assured project application.

Each custom energy efficiency project package shall contain a custom project feasibility study developed by CLEAResult that shall include the custom M&V plan. Upon package submission, a technical review ensues through the SCE Technical Review team. Revisions and resubmissions may take place during this technical review process to ensure adequate details are documented in the package that includes the M&V plan. Upon conclusion of the technical review or concurrently during the technical review where desired, CPUC may conduct their Custom Project Review Process. This independent CPUC review is initiated by the upload of the custom energy efficiency package to the CMPA list. CPUC shall provide their recommendation to approve the package prior to proceeding to implementation of the custom project.

This document is an accompaniment and to be used in conjunction with the SCE Implementation and Program Manual. The steps outlined below are intended to illustrate the Program Implementor (CLEAResult) quality assurance steps within the M&V Plan initiation and execution. All custom project packages (including M&V) shall be subject to SCE Technical Review and independent CPUC custom project review process.

Measurement and Verification Steps within Custom Incentive Application process:

* M&V Plan gets initiated with Application Pre‐ Approval
* Custom Application is received, with proposed M&V option and plan.
* M&V Plan is either approved, or revision required and resubmitted for approval by the CLEAResult Program engineering team to ensure quality assurance and compliance with the Statewide Custom Project Guidance Document.
* Customer (with vendors or Program Implementor) gather baseline data and post-installation data described in the M&V Plan
* Post Installation M&V plan implemented, and confirmation of completion lies with Program Implementer
* Custom project incentive payment request (post‐ installation) is received and reviewed, and either:
  + Accepted and approved, as M&V requirements have been met
  + Revisions or additional data requested, and the CLEAResult Program engineering team supports in providing recommendations to the participating Customer to satisfy M&V requirements

**CUSTOM PROJECT QUALIFICATION STEPS**

CLEAResult will assist participants in completing custom projects within the confines of the SEM program when these projects are beneficial to the customer and offer additional advantages over the SEM pathway. The pathway for carrying out the custom project qualification is described below:

1. Verify Project Eligibility:

Customers and Program Allies applying for Custom Project Incentives must:

* Propose to install measures within a customer-owned facility or facilities within the SCE service territory.
* Provide proof of financial solvency
* Commit to applying best efforts to meet measure installation milestones and in‐ service dates specified in the project application, pre‐ approval notifications and applicable pre- and post‐ site inspections
* Ensure that all measures are installed and operated in a manner that will achieve their estimated, Effective Useful Life (EUL)
* Agree to the pre and post installation requirements of the Measurement and Verification (M&V) Plan including data collection, reporting and allowing timely facility access to SCE and its contractors for purpose of site inspection, measure monitoring and installation verification.
* Agree to adhere to The Program terms and conditions, including Custom Project Incentive requirements, as specified and agreed to in the application approval process.
* Agree to release energy bills for the previous 12‐ 24 months to The Program throughout the Program duration.
* Agree to provide detailed energy use data to support the establishment of baseline and post implementation energy usages.
* Agree to commit operation staff time to support the project and provide facilities, operations and equipment documentation, building and control system access and energy use and cost data relevant to the project.
* Agree to provide other applicable supporting documentation like drawings, equipment lists, equipment datasheets, etc.

1. Estimate Savings:

* Create a savings estimate to determine project cost‐ effectiveness. This may involve utility bill analysis, field measurements (e.g., sub‐ metering), or contractor estimates, as reviewed by CLEAResult engineering staff and verified with the facility through interview and/or field measurement.
* Confirm the energy usage accounts for which the savings will be claimed. Verify that the estimated savings represent a reasonable portion of the total energy usage associated with the confirmed usage accounts. Net energy savings will be determined using the latest non-IOU fuel source and fuel substitution guidelines (Energy Efficiency Savings Eligibility at Sites with non- IOU Supplied Energy Sources — Guidance Document from CPUC website).
* Visit the site, as necessary, to verify baseline conditions and assumptions, such as equipment specifications, operating conditions, current control mechanisms, operating schedule, and planned scope of work.

1. Verify M&V Feasibility:

* Estimate the M&V time requirement, both pre and post.
  + Verify that the project start date and duration align with M&V requirements
* Discuss how savings could be measured, by reviewing:
  + What type of data is available (production, energy use)
  + What is the expected energy savings
  + Is there an Energy Management System which has the capability to produce CSV reports? If so, can trends be set up to establish baseline and post‐ retrofit data points for the equipment affected?
  + Is it possible to directly measure the loads that will be impacted?
  + How is the load impacted by weather, production, occupancy, or other factors?
* Verify site access for M&V activities.
  + Is a knowledgeable escort available for staff while onsite? Mechanical rooms and roof access are often locked.
  + Is an electrician available on site to install electrical monitoring equipment?
  + Is a controls expert (internal) or controls contractor (external) available to support operations management exploration and to set up trends?
  + Is a background check or safety training required?
  + What safety equipment is needed for site visits?
  + Are there any special site access safety trainings required?
* Verify the availability of documentation needed for M&V activities. Possibilities include:
  + Monthly utility bills, daily meter readings, or interval data
  + Daily or monthly production data (if an industrial facility)
  + Mechanical plans and specifications
  + Building or floor plans, and / or as built plans including additions/renovations
  + Process conditions and specifications
  + Previous energy studies
* Verify that all parties are willing to accept the risk that M&V results may turn out lower than expected.
* Define project responsibilities: who installs loggers, performs analysis, writes reports, etc.
  + Define equipment needed for M&V activities, including loggers and personal protective equipment (PPE).

1. Draft M&V Plan

* Determine the IPMVP Option to be used as the basis for the M&V Plan:
  + IPMVP Option A – Savings from an isolated measure are determined by field measurement of key performance parameters (e.g., measuring the operating hours of a lighting system)
  + IPMVP Option B – Savings from an isolated measure are determined by field measurement of the entire affected system (e.g., logging the energy use of a chiller and any influencing parameters)
  + IPMVP Option C – Savings are determined at the facility level by using monthly utility bills or interval data
  + IPMVP Option D – Savings are determined through an energy usage simulation (an energy model)
* Document the following in coordination with the facility owner or facility staff:
  + Definition of project site
  + Description of existing equipment and operation
  + The scope of the project and how savings are accomplished
  + Any sources used and/or assumptions made
  + Baseline adjustments or sampling techniques, if any
  + Which end‐ use equipment will be monitored and how
  + The duration of the pre and post measurements including the measurement interval
  + The analysis methodology
  + The results that will be reported
* Define a time frame for the implementation of the M&V plan.
  + Options A and B may require two weeks or more of pre and post retrofit data logging
  + Option C usually requires at least a year of pre‐ retrofit data and a few months of post‐ retrofit data
  + Option D requires staff who have the knowledge and availability to provide data to build the model

1. Get M&V Plan Approved

* Submit M&V plan to the M&V Lead at CLEAResult and customer for approval

1. Execute M&V Plan

* Perform all pre‐ retrofit measurements and logging identified in the M&V Plan. This to be completed by the Customer / Program Implementer, as required for baseline energy use.
* After installation, perform all post‐ installation measurements and logging identified in the M&V Plan. This to be completed by Customer/Program Implementer.

1. Draft M&V Report

* Analyze field measurements and data collected.
* Write M&V report of findings.
* Submit M&V report to an M&V CLEAResult evaluator for final review.

1. Get M&V Report Approval & Claim Savings

* Submit M&V report to the M&V Lead for approval.
* Submit M&V report to the SCE team for approval.
* Notify the customer of the savings results.
* Process incentive check.

**Deemed M&V Activities within the SEM program**

CLEAResult will assist participants in completing deemed projects within the confines of the SEM program when these projects are beneficial to the customer and offer additional advantages over the SEM pathway. Program staff will utilize program-specific checklists to verify completeness, accuracy, andeligibility of each application. The data review is composed of:

* Documentation supporting pre‐ implementation energy use associated with the measure(s) included in the application.
* Dated, itemized invoices and proof of payment, including:
* Equipment quantities, model numbers, material costs and shipping address to verify purchase of equipment associated with incentive.
* Installation, consulting and other services necessary to deliver/identify, scope, plan, install and verify installation of measures.
* Manufacturers’ specification sheets for each qualifying equipment type to verify the equipment meets the minimum efficiency standards necessary to deliver the energy savings estimated in the application.

## Normalized Metered Energy Consumption (NMEC): N/A

# APPENDIX. List of Acronyms and Abbreviations

| Term | Definition |
| --- | --- |
| C&S | Codes & Standards |
| CALCTP | California Advanced Lighting Controls Training Program |
| CEDARS | California Energy Data and Reporting System |
| CPUC | California Public Utilities Commission |
| DAC | Disadvantaged Communities |
| DEER | Database for Energy Efficient Resources |
| DSM | Demand-Side Management |
| EE | Energy Efficiency |
| EE PRG | Energy Efficiency Procurement Review Group |
| EM&V | Evaluation, Measurement & Verification |
| ET | Emerging Technologies |
| EUL | Effective Useful Life |
| FSU | Fractional Savings Uncertainty |
| HTR | Hard-to-Reach |
| HVAC | Heating, Ventilation, & Air Conditioning |
| IOU | Investor-Owned Utility |
| IP | Implementation Plan |
| kW, kWh | kilowatts, kilowatt-hours |
| M&V | Measurement & Verification (or, sometimes, Validation) |
| NMEC | Normalized Metered Energy Consumption |
| PA | Program Administrator |
| PAC | Program Administrator Cost |
| RFA | Request for Abstract |
| RFP | Request for Proposal |
| TRC | Total Resource Cost |
| WE&T | Workforce Education & Training |

1. D.18-05-041, Page 20-21 and Ordering Paragraph 7. [↑](#footnote-ref-2)
2. D.18-10-008, Ordering Paragraph 1-2 and Attachment B, Section A-B, Page B-1. [↑](#footnote-ref-3)
3. D.18-10-008, Attachment B, Section D, page B-9. [↑](#footnote-ref-4)
4. The expected causal relationships between program goals and program activities in a way that allows the reader to understand why the proposed program activities are expected to result in the accomplishment of the program goals. A well-developed program theory can (and should) also describe the barriers that will be overcome in order to accomplish the goals and clearly describe how the program activities are expected to overcome those barriers. *California Evaluation Framework*, June 2004. [↑](#footnote-ref-5)
5. The graphical representation of the program theory showing the flow between activities, their outputs, and subsequent short-term, intermediate, and long-term outcomes. *California Evaluation Framework*, June 2004. [↑](#footnote-ref-6)
6. Per D.19-08-009, for fuel substitution measures where the incentive exceeds the Incremental Measure Cost (IMC), the CPUC requires submission of a workpaper addendum using a separate template. Third-party implementers can request the template from their Contract Manager. SCE Program Managers should refer to the E-PPICs Smart Sheet. [↑](#footnote-ref-7)