SDG&E SMART (Savings, Measurement, Assistance, Rebates, Training) Industrials

Implementation Plan

2.16.2023

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# Program Overview

## Program Budget and Savings Information

### Program Name

SMART (Savings, Measurement, Assistance, Rebates, Training) Industrials Program

### Program ID Number

4006

### Program Authorization

### CPUC Decision 18-01-004 authorized SDG&E’s proposal to implement a Savings, Measurement, Assistance, Rebates, Training (SMART) Industrials program.

### Budget

Table 1 SMART Implementation Budget Allocation

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Cost Category Description | Start-Up | 2023 | 2024 | 2025 | 2026 | Total |
| Administration & Overhead | $3,000 | $157,583 | $264,106 | $272,352 | $222,384 | $919,424 |
| Marketing, Outreach | $3,500 | $236,878 | $233,228 | $232,670 | $135,940 | $842,216 |
| Direct Implementation – Non-Incentive | $43,500 | $1,802,678 | $3,264,379 | $3,381,215 | $3,019,286 | $11,511,059 |
| Direct Implementation – Incentive | $0 | $276,536 | $671,330 | $850,451 | $760,741 | $2,559,058 |
| Total NTE EE Budget | $50,000 | $2,473,675 | $4,433,043 | $4,736,689 | $4,138,350 | $15,831,757 |
| EE+DR Integration | $1,400 | $15,800 | $26,000 | $38,000 | $38,000 | $119,200 |
| Total NTE EE+DR Budget | $51,400 | $2,489,475 | $4,459,043 | $4,774,689 | $4,176,350 | $15,950,957 |

### Gross Impacts

Table 2 Energy Savings Goals

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| SMART Industrials Goals | 2023 | 2024 | 2025 | 2026 | Total |
| Gross Energy Savings (kWh) | 6,232,905 | 13,212,013 | 13,083,126 | 12,390,826 | 44,918,870 |
| Gross Energy Savings (therms) | 135,509 | 192,692 | 358,178 | 276,978 | 963,357 |
| Gross Demand Reduction (kW) | 627 | 1,327 | 1,319 | 1,248 | 4,521 |
| Net Energy Savings (kWh) | 5,832,047 | 11,595,074 | 10,958,505 | 10,428,352 | 38,813,978 |
| Net Energy Savings (therms) | 107,323 | 143,456 | 260,266 | 203,005 | 714,051 |
| Net Demand Reduction (kW) | 585 | 1,163 | 1,102 | 1,048 | 3,899 |

### Program Cost Effectiveness (TRC)

Table 3 Overview of SMART Industrials cost-effectiveness goals, 2022-2026

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| SMART Industrials Goals | 2023 | 2024 | 2025 | 2026 | Total |
| Total Resource Cost (TRC) | 1.26 | 1.10 | 1.37 | 1.37 | 1.28 |
| Total System Benefit (TSB) | $3,224,319 | $5,162,796 | $7,036,449 | $6,178,710 | $21,602,274 |

### Program Cost Effectiveness (PAC)

Table 4 Overview of SMART Industrials program cost-effectiveness goals, 2022-2026

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| SMART Industrials Goals | 2023 | 2024 | 2025 | 2026 |
| Program Administrator Cost (PAC) | 1.31 | 1.17 | 1.50 | 1.51 |

### Type of Program Implementer

1. \_\_\_ Core
2. **\_X\_ Third Party**
3. \_\_\_ Partnership

### Market Sector

1. \_\_\_ Residential
2. \_\_\_ Commercial
3. \_**X**\_ Industrial
4. **\_\_\_** Agricultural

### Program Type

1. **\_X\_ Resource Acquisition**
2. \_\_\_ Emerging Technology Assessment
3. \_\_\_ Equity (category added by SDG&E)
4. \_\_\_ Market Support (category added by SDG&E)

### Market Channel

1. \_\_\_ Upstream
2. \_\_\_ Midstream
3. **\_X\_ Downstream**

### Intervention Strategies

1. \_\_\_ Direct Install
2. **\_X\_ Incentive**
3. **\_X\_** **Financing**
4. **\_X\_ Audit**
5. **\_X\_ Technical Assistance**

# Implementation Plan Narrative

## Program Description

The SMART (Savings, Measurement, Assistance, Rebates, Training) Industrials Program offers a suite of energy efficiency (EE) services to SDG&E’s entire industrial sector, including industrial customers served by the Port of San Diego, tailored to their business type, size, and financial needs. SMART Industrials leverages strategic energy management (SEM), training for customers and vendors, high-quality engineering support, attractive incentives and financing options, and an innovative path to cost-effective energy savings for the significant number of small and medium businesses (SMBs) within SDG&E’s industrial base.

SMART Industrials includes a streamlined participation track for smaller customers to make program engagement easy and straight-forward and information about financing options, including on-bill financing and a third-party financing option, to help alleviate participant concerns about the up-front financial burden of investing in projects. By targeting SMB industrial customers within this offering, we eliminate the barrier they face trying to engage with a more general SMB program that may not be relevant to the industrial sector.

SDG&E’s industrial sector includes some of their largest energy consuming customers making SMART Industrials a key contributor to achieving sector and portfolio savings goals. SMART Industrials also contributes to SDG&E’s efforts to comply with the requirements of the California Public Utility Commission’s (CPUC) Decision 16-08-019, which directed program administrators to transition a majority of third-party designed and implemented program.

The objectives of the SMART Industrials program include:

* Secure participation through program outreach approaches that appeal to the unique interests and needs of industrial-sector customers.
* Increase industrial-sector customer awareness of energy (and water) efficiency and IDSM opportunities.
* Decrease financial and other participation barriers for vendors and industrial-sector customers, especially hard-to-reach (HTR) customers and those in disadvantaged communities (DACs)

## Program Delivery

SMART Industrials is designed to occur over a 4-year timeline. The program will be delivered via the following phases:

### Recruiting/Outreach

The participant recruiting strategy will follow an approved Marketing Plan. Specific elements of SMART Industrials’ participant recruitment strategy will include:

* Hosting Training Initiated Engagement (TIE) workshops offering relevant energy efficiency training to engage and enroll large participants.
* Developing publicly accessible selection of segment-specific, industrial sector online training videos focused on finding and implementing appropriate measures that provide a clear path to deemed measure applications.
* Conducting outreach through trusted industry and Port-specific associations, SDG&E Account Executives, industrial-equipment vendor connections, and marketing online training videos to SMB tenants.

The following recruiting activities will be used with the specific intent of engaging HTR customers and DACs:

* Develop program specific collateral that will be available in two or more languages to make SMART industrials more accessible to HTR customers.
* Conduct email campaigns that generate awareness of program opportunities with information and links to the program webpage.
* Use a combination of GIS software and publicly available business data to identify HTR customers and customers located in DACs.

### Eligibility Screening

Cascade’s SMART Industrials implementation team (outreach staff, subcontractors, or trade professional alliance members) will confirm that the participant meets all SMART Industrial eligibility criteria, and that the applicant has the authority to request the incentive or service. This process includes, but is not limited to, confirming the participant is an industrial-sector customer as determined by SDG&E’s criteria (NAICS code or other), and that the applicant is an SDG&E customer as verified by their most recent utility bill and is paying the public purpose program surcharge. The team will then explain the program offering and expectations to the customer, working to define and influence the SEM opportunity and other energy efficiency projects. Eligibility screening will include assessments of the potential participant’s ability to participate in SEM educational modules, coaching calls, and complete project installation within SMART Industrials terms of participation.

### Project Planning

Cascade will finalize the project scope, project timing, savings estimate, measurement and verification (M&V) strategy, and incentive/financing commitment. For custom projects, customers or trade allies will submit an application and a signed commitment form to reserve incentive funding and to prevent “double-dipping”. For custom projects, approval is required by Cascade and SDG&E before a participant orders energy efficiency equipment. For Normalized Metered Energy Consumption (NMEC) projects, installation of Behavioral, Retrocommissioning, and Operational efficiency (BRO) measures prior to project approval does not disqualify savings claims or customer incentive, allowing customers to build energy savings momentum by implementing no-cost energy savings opportunities as soon as possible. Final project approval is still required by SDG&E and Cascade following project identification, program enrollment, gathering of baseline data, and submission of a Project Feasibility Study (PFS). Strategic Energy Management (SEM) participants will sign an enrollment agreement for a two year engagement with the program. SEM participation will follow the latest version of the California Industrial SEM Design[[1]](#endnote-2) and M&V[[2]](#endnote-3) Guides.

### Project Installation

Participating customers or trade allies will install approved energy efficiency measures. All non-BRO measures must be installed per the manufacturer’s recommendations and comply with the requirements listed in either the PFS or appropriate deemed measure workpaper. Once installation is complete, applicable project completion forms and supporting documentation will be submitted by the participant or trade ally to Cascade.

### Review/M&V

All inspections and M&V will be completed by Cascade Team. Upon acceptance of verified savings, Cascade will pay incentives to participants or pass them through participant-designated contractors.

### Participant Services

SMART Industrials program delivery is accomplished by providing participants with valued training that builds trust and leads directly to projects. SMART Industrials employs a broad-reaching recruiting process to engage the greatest number of prospective participants and will offer the following services:

#### Training Initiated Engagement (TIE) Workshops

Workshops will be a key strategic tool to engage participants early. Workshops will also provide a platform to exchange information on baseline operations, communicate best practices, and help program staff better understand each participant’s energy demand and usage. Workshops will be offered to large participants both in-person and using live virtual events. For small to medium businesses, workshops will be presented through asynchronous online video modules.

#### Project-Finding Site Visits

Once a participant expresses interest, eligibility requirements have been confirmed, and a participant agreement has been signed, a site visit will be scheduled for the applicable program offering. For SEM, NMEC, and custom/deemed offerings, the site visits will be called treasure hunts, tune-ups, and site visits, respectively. During each of these visits we will document energy efficiency opportunities and major energy consumers at the facility in a summary report. Measures the participant wishes to pursue will be implemented with guidance from Cascade’s technical experts. Deemed measures will utilize state workpapers and custom measures will follow a standard process for custom project review.

#### Site-Specific NMEC

Through site-specific NMEC where applicable, SMART Industrials will improve the participant experience by streamlining the participation process and allowing more energy and utility bill savings. NMEC allows participants to complete multiple behind-the-meter measures (project bundle) that can be aggregated into a single project application. For eligible on-site loads, we will use site-specific NMEC to capture verified BRO and capital project savings in compliance with California Public Utilities Commission (CPUC or Commission) M&V requirements. NMEC allows SMART Industrials to capture savings quickly, monitor persistence, and achieve higher Total Resource Cost (TRC) by leveraging the net-to-gross (NTG) ratio of 0.95. One benefit of NMEC is “commission staff reviews of NMEC projects will not cause project stoppages or delays, and do not constitute approval.”[[3]](#footnote-2) While incentives are not guaranteed prior to project approval, NMEC participants will have the option to implement identified measures once the baseline period has been defined. This strategy will open new areas of energy savings, tie savings claims directly to actual performance, increase TRC, and improve participant satisfaction.

#### Energy Coaching

Each SEM participant will be assigned a single-point-of-contact, knowledgeable energy coach who works to simplify SMART Industrials participation, build trust, break down project implementation barriers, and provide expert technical and project management support. The participant’s assigned energy coach will work closely with the participant and designated technical leads to help implement the opportunity register of projects identified during the treasure hunt.

#### Energy Sensei™

Energy Sensei™ is an interactive, energy tracking platform that will be available for SMART Industrial participants who participate via SEM or commit to multiple projects. This cloud-based software is where the opportunity register resides and serves as a collaboration platform for Cascade, Evaluators, and SDG&E. Energy Sensei will also be used to visually display energy savings over time, providing the participant with actionable energy data to encourage project implementation.

#### SEM Enrollment

In addition to the services listed above, participants who enroll in Strategic Energy Management will benefit from additional educational modules, peer to peer learning and accountability groups with similar industrial facilities, and employee engagement resources to drive additional energy savings across the facility.

#### Financing Options

The program will address customer capital concerns and enable Program participation by offering financing to customers or directly to vendors and contractors, including SDG&E’s On-Bill Financing, as well as through Cascade’s financing partners, such as NEI Fund.

## Program Design and Best Practices

### Outreach

#### Trade Associations

Connections to industry associations enhance the SMART Industrials program’s credibility, provide access to customer insights, and boost program outreach efforts. These organizations typically have a network of education and communication channels we can leverage to promote the benefits of energy efficiency and program offerings. Cascade has strong existing relationships with influential industry associations such as the San Diego Regional Economic Development Corp, California League of Food Producers, California Manufacturers & Technology Association, and the Refrigerating Engineers & Technicians Association. Our approach to engaging new industry associations is to attend their annual meetings and share information about the benefits of energy efficiency, ensure the name of our Outreach Lead is known, and foster relationships with intra-market influencers.

#### Industrial-equipment Vendors

Vendors of industrial equipment spend every day interacting with customers at the time they are considering changes to their facilities or equipment. This is precisely when customers are most ready to consider advice and opt into an energy efficiency upgrade. We aim to build trust with vendors by providing high levels of customer service at the time they are working with participants on rebate applications and making program participation as streamlined as possible. By providing responsive support, our goal is to develop long-term relationships with vendors who are then likelier to continue bringing leads to the program. Cascade has developed relationships with local and national vendors serving the industrial sector through our delivery of multiple ongoing energy efficiency programs in California including refrigeration, lighting, fast-acting door, and boiler/steam system vendors.

### Integrated Demand Side Management (IDSM)

SMART Industrials’ approach looks beyond energy efficiency solutions to a comprehensive awareness of participant needs and challenges. Accordingly, our energy coaches and engineers will help participants navigate a complex landscape of demand-side solutions by weaving these elements into training events, treasure hunts, educational modules, and one-on-one participant meetings. Relevant IDSM topics include:

* High global warming potential refrigerant change-out: as California evolves to a Total System Benefit (TSB) metric, refrigerant projects can capture significant greenhouse gas (GHG) benefits and contribute to program cost-effectiveness.
* Transport and stationary electrification: SMART Industrials will seek out opportunities to partner with pilot programs offered by SDG&E, the California Energy Commission, or other entities and cross-enroll program participants in electrification demonstration projects for equipment such as short haul trucks, tractors, and diesel engine pumps.
* Storage and renewables: Distributed energy resources will offer significant benefits in some grid locations and some rate schedules. SMART Industrials’ energy coaches will review relevant opportunities with participants and guide them toward additional information. Cascade believes Energy Sensei can be utilized effectively to provide the scale and timing of Distributed Energy Resources (DER) opportunities at the site level to SDG&E.

#### Limited Energy Efficiency and Demand Response Integration

Cascade will integrate limited energy efficiency and demand response (DR) to take advantage of opportunities with demand response functionality at little incremental cost and to complement energy efficiency investments, including assistance to participants as the rollout of time-varying electric rates continues to take place. Limited EE-DR Integration is funded separately within the SMART Industrials program budget[[4]](#footnote-3) and will be incorporated into deliverables during implementation. Relevant activities include the following:

* Kick off meeting and follow ups specific to EE/DR integration with Industrial DR and demand side management stakeholders, including identification of peak demand drivers, and reviews of 15-minute interval energy consumption data where available.
* Identifying measures that can provide EE/DR benefits.
* Identifying vendors that can support EE/DR measure installations.
* Developing training materials to promote EE/DR integration and peak kW reduction.
* Incorporating EE/DR materials into TIE training.
* Promoting DR measures and projects to appropriate SMART Industrial participants.
* Including EE/DR opportunities in site audit reports.
* Scheduling calls with participants to answer questions and highlight energy and cost savings.
* Subject to budget availability, evaluate DR opportunities and participation with small and medium businesses using Energy Sensei.

### Program Tracks

#### Small Business Track < 200 kW

This track offers Small to Medium Business (SMBs) support with deemed and custom projects. It also offers a lower-touch/higher-volume version of SEM (SEM for SMBs). SEM for SMBs approaches will incorporate all the elements of the current version of the Statewide SEM Design and M&V Guides posted on the CPUC-approved website. Targeted marketing strategies are used to increase participation and capture savings from hard-to-reach (HTR) customers and customers in disadvantaged communities (DACs).

#### Large Customer Track > 200 kW

This track addresses technically rigorous savings projects that range from simple/affordable to complex/expensive and includes all industrial processes and systems. Participants are targeted via training-initiated engagement (TIE) and offered a menu of options including SEM, project engineering support, incentives, and financing for all measures through pathways with SMART Industrials: deemed, custom, NMEC, and SEM.

### Strategic Energy Management Plan

#### SEM Participants

Both small and large customer track participants will be considered for SEM participation. To make SEM successful for different size companies the program will offer two versions of SEM, called SEM and SEM for Small and Medium Business (SMB). The offerings are similar, and both will adhere to the design requirements in the SEM and M&V design guides. Primary differences are related to staffing requirements and the structure of workshops and educational modules.

After customer engagement using the recruiting/outreach activities outlined in Section 2.2.1, eligible sites will be asked questions to determine readiness for SEM enrollment. Small and large customer track companies that are considered good candidates for SEM can participate in either SEM or SEM for SMBs. The decision will be based on factors such as availability of support staff and number of subsystems.

SEM participants sign up for a two-year or longer engagement along with a group of peer facilities. SEM cohorts will begin when customers are recruited (and not necessarily in sync with the SMART Industrials program calendar). SEM savings claims will be made after each SEM participation year. Sites with significant mid-cycle savings may have additional reporting periods and associated energy claims which correspond to SMART Industrials program years.

SEM participation includes:

* Workshops with other industry peers
* Treasure hunts to identify projects and create an opportunity register.
* Single-point-of-contact coaching from Cascade’s experts on project identification and installation.

If SEM participants are interested in implementing custom projects, a SMART Industrials energy coach will screen and identify valid projects. SMART Industrials staff will review incentive and financing options and provide engineering support and oversight over project installation. Following installation, SMART Industrials engineers will conduct all required M&V and customer incentives will be provided by SMART Industrials.

#### Number of Cycles and Program Sequence

Customers participating in SEM will enroll in SEM Cycle 1 (2 years). Following Cycle 1, interested participants who completed all prior cycles will have the opportunity to enroll in Cycle 2 and Cycle 3. Participant’s in SDG&E’s existing SEM Program, which is closing, will be given the opportunity to enroll in Cycle 3, as well. The three cycles sequentially follow one another and will offer participants additional tools and time to capture energy savings. Therefore, participation in Cycles 2 and 3 is limited to eligible participant facilities who have completed all prior cycles. The SMART Industrials Program contract spans 4 years, which provides new participants who enroll in year 1 the ability to complete 2 full SEM cycles. For eligible participants who wish to continue to a subsequent cycle, SDG&E will either extend the contract if the program is successful or allow participants to continue with the next selected implementer when the industrial sector is resolicited.

The following three figures illustrate the program sequence for Cycles 1, 2, and 3, respectively.

Figure 1 Program Sequence for SEM Cycle 1

#### Timeline Description automatically generated

Figure 2 Program Sequence for SEM Cycle 2



Figure 3 Program Sequence for SEM Cycle 3

Timeline

Description automatically generated

#### Implementation Roles and Responsibilities

The following roles and associated responsibilities are defined in the SEM Design Guide with the text copied below for convenience.

**Program Administrator**

The SEM Program Administrator (PA) ensures that the SEM program is delivered by the implementation contractor as expected. The PA oversees all aspects of the SEM program and has the following key roles:

1. Coordinates activity between the sponsoring utility’s staff and contractors and the implementation contractor.
2. Is responsible for ensuring the proper review, approval, and of reports and key documents to ensure program progress, influence and quality is properly documented.
3. Is responsible for ensuring participant issues and implementation contractor issues are resolved.
4. Decides whether or not the SEM Program will offer optional activities.
5. Is responsible for ensuring implementation schedules and commitments are kept.

**Program Implementer**

The Implementation Contractor is responsible for ensuring participants meet the SEM program objectives, all progress and projects are properly documented, and energy savings are properly modeled and documented. Although the Implementation Contractor may have a team that consists of multiple individuals supporting participants, the expectation is that there is one participant-facing individual responsible for supporting participants and communicating progress with the PA. This individual, called the SEM Coach, will:

1. Maintain regular communication with the PA regarding participant progress and issues.
2. Maintain regular one-one communication with participants, including performing site visits as necessary, to ensure all program expectations are met.
3. Develop and review with the PA all educational and activity material and content.
4. Ensure educational and site-level activities are properly facilitated and meet program requirements, including any learning objectives.
5. Ensure proper technical support is provided during Treasure Hunt and for any resulting projects.
6. Ensure all energy consumption models and M&V documentation is delivered on-time and to the requirements of the M&V Guide.
7. Ensure all program data, documentation, and contact information meets program requirements.

**Participant**

The SEM participant must designate a member of staff for each of these roles:

**Data Owner:** The data owner is responsible for ensuring that a plan is created for collecting energy data and relevant variable data, that the plan is followed, and that data is properly screened and documented.

**Energy Champion:** The Energy Champion is responsible for the success of the SEM program at the site. This individual is responsible for coordinating both with the SEM Coach and internally with any site staff, including the Energy Team, Data Owner, and Executive Sponsor.

**Energy Team**: The Energy Team is typically a cross-functional team (i.e. management, production, procurement, maintenance, HR) that meets regularly to manage and develop any energy management-related business practices and activities.

**Executive Sponsor:** The Executive Sponsor should be the highest-level manager available at the site (typically the site or facility manager) and is responsible for ensuring the Energy Team has the resources it needs to succeed during the SEM program.

#### Incentives and Milestones

The Industrial SEM program offers a hybrid incentive approach designed to encourage SEM practices and drive cost effective energy savings at a site, as described in the CA SEM Design Guide. Adoption of SEM is a multi-year process, and incentive payments are staggered and tied to key milestones or specific accomplishments to keep participants engaged and retain focus on the highest impact SEM activities over the course of the long program.

* Milestone incentive payments (applicable in Cycle 1 only): Each site participating is eligible for a total of 3 Milestone incentive payments over the course of the 2-year Cycle 1 engagement. SEM milestone incentive payments will be $1,000 each and SEM for SMB milestone incentive payments will be $500 each. Participants will earn milestone incentives for the following activities. Milestone incentives will be paid as earned.
  + SEM Milestones
    - Milestone 1 – Month 4 - $1,000
      * Establish the Energy Team
      * Announce SEM program participation to entire company
      * Attend Workshops 1 & 2
      * Provide production data needed for energy modeling
    - Milestone 2 – Month 9 - $1,000
      * Revisit energy savings goal
      * Lead check-in calls
      * Update leadership on progress
      * Attend Workshops 3 & 4
      * Provide production data regularly
      * Complete three energy saving projects
    - Milestone 3 – Month 12 - $1,000
      * Attend Workshop 5
      * Provide production data regularly
      * Share end-of-year data needed for energy savings calculations
      * Complete a total of five energy saving projects including at least two “gems.” (Gem energy saving projects are defined as a combination of high savings and low cost)
  + SEM for SMB Milestones
    - Milestone 1 – Month 4 - $500
      * Attend Workshops 1 & 2
      * Complete Treasure Hunt and identify priority projects
    - Milestone 2 – Month 9 - $500
      * Attend Workshops 3 & 4
      * Complete two energy saving projects
    - Milestone 3 – Month 12 - $500
      * Attend Workshop 5
      * Provide end-of-year data needed for energy savings calculations
      * Complete a total of three energy saving projects including at least one “gem.” (Gem energy saving projects are defined as a combination of high savings and low cost)
* Performance incentive payments: Participants will be paid incentives based on energy savings calculated through the model, after netting out savings associated with pre-planned and EE projects incented through other programs. These savings are defined and required to be reported as “SEM BRO Energy Savings” in the Guides. Program participants who comply with all program requirements are eligible to receive a post-measurement performance incentive of $0.01/kWh and $0.10/therm. SEM savings claims will be made after each SEM participation year. Sites with significant mid-cycle savings may have additional reporting periods and associated energy claims which correspond to SMART Industrials program years. Final determination of performance-based savings rests solely with the utility.
* Capital project incentive/rebate payments: Participants in the Industrial SEM program are eligible to receive standard rebates for energy efficient equipment and incentives for custom projects. Savings from capital projects initiated due to the SEM effort will be assessed based on an existing conditions baseline and these projects will be assigned a Net to Gross (NTG) of 1[[5]](#footnote-4). Measures must be pre-approved, installed and verified according to the applicable program (either SEM following approved levels of rigor or statewide custom process) requirements and criteria prior to payment. Sections 8 and 11 of the SEM M&V Guide address this topic in detail and are the primary reference, along with the Custom Program Manuals, for how capital project savings are treated in the Industrial SEM program.

#### Measurement, and Verification (M&V)

The M&V Plan for the Industrial SEM program is designed to the requirements of the statewide *California Industrial SEM M&V Guide*, which describes procedures for quantifying the savings for each participating customer, as well as estimating program savings achieved. The SEM M&V Guide details the process for creating the energy model, testing its validity, making updates to it, calculating savings, and handling the reporting of pre-planned and incented capital projects such that energy savings are not double counted by the program. Further, the SEM program will leverage: (a) the California Statewide Custom Project Guidance Document[[6]](#footnote-5) for performing bottom-up savings calculations for custom capital project implementation and (b) approved statewide measure packages for determining savings for deemed measure implementation resulting from SEM program engagement.

The M&V Guide was developed using methodologies, protocols and best practices from national SEM leaders including:

* US DOE’s Superior Energy Performance
* Energy Trust of Oregon
* Bonneville Power Administration

Industrial SEM savings will be calculated using at least one year of pre-engagement, whole-facility data to develop the energy saving adjustment (i.e. regression) model that is based on IPMVP Option C[[7]](#footnote-6), using essentially the same methodology that has been used successfully in the mature SEM resource acquisition programs[[8]](#footnote-7). In certain cases, energy savings for individual projects may also be calculated outside of an energy saving adjustment model and reported as an aggregated bottom-up savings estimate, as described in the SEM M&V Guide.

To calculate electric peak demand savings, the program uses a Demand Savings Calculator approved by the CPUC ED. The initial Calculator converts annual energy savings (in kWh) to demand savings (kW) based on standard load shapes. At some future time, it may be replaced by site-level regression models that meet the requirements of an updated statewide M&V Guide.

The program is designed to include several self-evaluation elements. These include:

* A clear record of pre-engagement energy savings plans by the participant
* Consistent reporting of milestones and deliverables
* Evaluations, by participants, of all workshops and key activities
* A clear log of identified energy saving opportunities, including savings estimates and implementation dates
* An annual assessment of energy management practices
* A clear annual summary of each participant’s activities, energy saving projects, estimated savings, and interaction with the program
* An annual energy consumption adjustment model that includes:
  + Data quality reviews by Cascade
  + Model reviews by the IOU twice annually
  + At least 12 months of baseline data and 12 months of performance data for each performance year
  + Clear documentation on decisions taken in the development of the model
  + At least bi-yearly data updates

#### SEM Reports

One key report is used as the M&V Report:

SEM includes a variety of reports or summaries that detail the participants involvement throughout the process. These reports and a brief description of each are outlined below.

* Educational Module Summary:
  + This report includes location information, participant attendance, summary of activity, information on key-note speakers, group activities, and a conclusion to summarize each educational module.
* Scoping Summary:
  + This report identifies existing conditions of participant sites prior to the SEM engagement. There is one Scoping Summary per participant, and it’s completed in Year 1. This report includes general information, company overview/background, SEM readiness, energy efficiency history, energy data, and recommended next steps.
* Significant Energy Use (SEU) Selection Report:
  + This report is inclusive of the Energy Map and includes general information on SEUs and who selected these SEUs.
* Energy Management Assessment (EMA) Summary Report:
  + The EMA consists of questions relative to each SEM Cycle given guidance from the Department of Energy’s 50001 Ready Energy Management Assessment. Each task and subtask are scored to understand participant’s performance on SEM topics.
* Treasure Hunt Summary:
  + This report provides details on each Treasure Hunt. There is one Treasure Hunt Summary per participant, and they are completed after each Treasure Hunt. This report includes general information (i.e., location, date of event, attendees), the process of the Treasure Hunt and areas of focus, as well as next steps (i.e. identified projects, cycle goals, and customer needs).
* Cycle Decision and Transitioning Summary Report:
  + This report provides an overview of a site’s intention as they complete Cycles 1 and 2 and if they wish to continue onto the next SEM Cycle. The intent of each participant can include Energy Team recycling, energy savings goals, and other key learning objectives.
* Annual Mid-Year Review:
  + This is an annual review of the M&V process with the Implementer and Program Advisor to ensure the SEM program is staying on track in terms of annual submission of energy savings to the CPUC. This is no report submittal for Mid-Year Review.
* SEM Reporting Period Performance Report:
  + This report records the M&V process of energy savings calculations. It’s intended to be both participant and Program Advisor facing.

#### Savings Reporting

In each cycle, the SEM Program Engagement Period is comprised of two 12-month Reporting Periods. The two Reporting Periods follow one another. As such, the first Reporting Period begins immediately following the conclusion of the Baseline Period, though a delay of up to 3 months may be inserted in certain instances. The second Reporting Period begins immediately following the conclusion of the first Reporting Period and ends at the conclusion of the SEM Program Engagement Period. In most cases, an Annualization Period of at least 90 days during the final months of the SEM Program Engagement Period will be used to determine total savings.

Energy savings are determined using a Baseline Period that is valid for two years (the duration of the SEM Program Engagement Period). A new Baseline Period may be specified for subsequent cycles if the original baseline period is no longer viable.

Savings for the Industrial SEM program will be reported as follows:

1. ***Facility-wide Energy Savings***: The overall savings the facility achieved during the reporting period. This includes all savings listed below and is used by the facility to estimate their performance improvement versus goal.
2. ***Non-SEM Program Energy Savings***: Pre-existing projects identified and planned prior to SEM engagement and implemented during the SEM engagement, whether receiving incentives or not.
3. ***SEM Program Energy Savings***: Facility-wide Energy savings minus Non-SEM Savings, used by the program to calculate program effectiveness.
4. ***SEM Incented Project Energy Savings***: Incented projects (i.e. custom capital projects) identified, planned, and implemented during the SEM engagement receiving incentives at or near the incentive rate for another program (i.e. “capital project” incentive rate).
5. ***SEM BRO Energy Savings***: SEM Program Savings minus SEM Incented Project Savings.

The above approach to SEM energy savings ensures that SEM BRO Savings are calculated net of the savings that result from SEM Incented Projects (i.e. custom capital projects and prescriptive rebates). Custom SEM Incented Projects will be facilitated via the process described in the current Statewide Customized Offering Procedures Manual for Business.

An Opportunity Register spreadsheet tool is used by participants and Cascade to manage energy improvements from identification though completion. The Opportunity Register provides a record of implementation of all types of energy saving activities and projects, including pre-planned and capital projects, and is a key source of information used in SEM M&V.

* Opportunity name
* Description of the opportunity
* Type of action (O&M, capital, or energy management)
* Date completed
* SEM influence (note on how this opportunity was identified)
* Subsystem
* Location, where necessary
* Energy savings estimate
* Implementation Status
* Owner of implementation
* Persistence strategy for significant projects

#### SEM Participation

The program will procure participants through direct customer outreach conducted by Cascade’s staff. Outreach strategies will vary depending on customer size, but Cascade plans to leverage SDG&E’s Account Executives, along with its own network of contacts, collaborate with industry associations, and conduct market research to identify prospective customers, as well as with potential candidates for SEM. Cascade will then schedule a virtual or in-person meeting with each prospect to assess their interests and needs and screen for SEM readiness. To be eligible for the program, the customer must have an active SDG&E electric or natural gas account that pays the Public Purpose Program (PPP) surcharge and be classified as “industrial” by their North American Industry Classification System (NAICS) code or SDG&E.

## Innovations

### Energy Sensei

Cascade will use Energy Sensei, our in-house, cloud-based energy management and collaboration software, to manage participant -specific opportunity registers, track savings persistence, and document influence. We expect a boost in net savings (higher NTG) from Sensei's ability to offer actionable energy data, document project influence, and generate savings persistence documentation. Figure 1 shows Energy Sensei and its capabilities.

Graphical user interface

Description automatically generated with medium confidence

Figure 4 Energy Sensei Offerings

### Self-serve, Online Video Modules

Online video modules help reach SMB customers cost effectively and ensure additional program resources are spent only on engaged and interested customers.

### Intelligent Outreach Through Trusted Market Actors

The size of the industrial sector creates the need to engage participants through existing and trusted channels. We will coordinate with trade associations, equipment vendors, and contractors to create new participant acquisition channels through resources already influencing customer decisions.

### Long-term Single-Point-of-Contact Industry Experts

Large customers and all those who enroll in SEM are assigned a single-point-of-contact energy coach to provide technically competent service, reducing participation barriers. Energy coaches are industry-sector experts. They handle all energy efficiency inquiries from their participants and proactively touch base to review and implement energy projects.

### Promote IDSM and Water Energy Nexus

SMART Industrials promotes projects that save energy via controls upgrades, which can also be used for load-shifting capabilities. Through training, participants will be educated on opportunities to save during high-demand periods and participate in demand response and time-of-use programs. SMART Industrial trainings will also cover the full lifecycle of industrial water use, including energy-intensive pumping, highlighting opportunities to improve efficiency at each step of the process. SMART Industrial’s promotion of BRO projects, use of NMEC approaches when appropriate, and partnerships with trusted vendors will all encourage participants to tune-up and invest in their equipment, delivering energy savings in alignment with California policy goals and SDG&E’s Business Plan.

## Metrics

See Metrics in Attachment 1 – Policy and Procedures Manual.

## For Programs Claiming To-Code Savings

To-code (and to-industry standard practice, or “to-ISP”) savings potential is widely present in the industrial sector, particularly in facilities more than 20 years old where equipment is not past its useful life, but the specifications or applicability of codes have evolved. As a result, many industrial sites have grandfathered equipment and systems that remain operable though they operate below code (or below ISP). As such, changes to any portion of these systems or equipment can trigger additional upgrades, requiring additional changes to ensure compliance with current codes and standards. It is common for participants in this situation to avoid bringing equipment to code as the costs outweigh the benefits and the incentive is not sufficient to accelerate turnover. California Assembly Bill 802 and other policies have explicitly recognized and sought to capture this stranded potential, but the industrial sector continues to face unique challenges to cost-effective project scoping and implementation.

To influence these potential projects, measures that capture to-code savings will be part of SMART Industrials; to-code projects are eligible for incentives and savings claims via deemed (if equipment pre-dates code requirements), NMEC, and custom methodologies. SEM, with its metered baseline, captures to-code projects. For sites using Site-Level NMEC methodologies to determine savings, to-code measures will be identified, listed in project-level reporting, and supported as applicable with documentation of existing equipment operability and program influence in accordance with SDG&E and CPUC guidance and the SMART Industrials Program-Level Measurement & Verification (M&V) Plan. Similarly, where allowed by CPUC and SDG&E policy guidance, SMART Industrials may also implement to-code or to-ISP projects via the standard custom project review and approval process.

## Pilots

Pilots are not applicable for SMART Industrials.

## Workforce Education and Training

SMART Industrials includes some general workforce development strategies, including:

* Proactively identify and engage diverse business enterprise (DBE) vendors, original equipment manufacturers (OEMs), and distributors, Hard to Reach (HTR) Customers, particularly those that work in disadvantaged communities (DACs) and involve them in the SMART Industrials program. When a new vendor is engaged, we will establish service standards, provide clear incentive, and rebate guidance, and offer applicable energy efficiency education to support continuous growth opportunities for DBEs in SDG&E territory.
* Where applicable, we will provide training and education to vendors, OEMs, and distributors working with SMART Industrials to expand the extent to which they participate in utility energy efficiency programming and support industrial customers. We will provide guidance to vendors to help them address all opportunities for the industrial customers with whom they engage.

Cascade will track these efforts and regularly report progress to SDG&E.

## Workforce Standards

### Prescriptive Workforce Standards

HVAC and lighting workforce standards (D.18-10-008) may apply to SMART Industrials. A small portion of program savings are expected to come from standalone HVAC and lighting controls projects, incentives for which exceed $2,000 (lighting controls) or $3,000 (HVAC). For measures where workforce standards apply, Cascade will set expectations at the incentive agreement stage by including compliance-attesting agreements that explicitly state the options for compliance and make incentive payments contingent upon compliance. The relevant HVAC and Lighting standards include:

1. HVAC Measures
   1. Installation, modification, or maintenance of non-residential HVAC measures with an incentive of $3,000 or more are required to be installed by workers or technicians that meet one of the following criteria:
      1. Enrolled in and/or completed an accredited HVAC apprenticeship.
      2. Completed more than five years of work experience at the journey level per California Department of Industrial Relations definition, passed competency tests, and received specific credentialed training.
      3. Has a C-20 HVAC contractor license issued by the California Contractor’s State Licensing Board.
2. Advanced Lighting Control Measures
   1. Installation of non-residential lighting control measures with an incentive of $2,000 or more are required to be installed by installation technicians who have completed the California Advanced Lighting Controls Training Program (CALCTP).

### General Workforce Standards

Cascade and our subcontractors will not be directly involved in installing or maintaining equipment as part of SMART Industrials. Program participants will have the flexibility to decide who will install energy efficiency measures under SMART Industrials (employee, vendor, or contractor). Cascade will collect all documentation necessary to demonstrate that each worker or technician involved in the project meets the criteria specified in D.18-10-008. To reduce the risk of lost energy savings within the program, the Cascade team will:

* Clearly detail equipment specifications in the program application and in all vendor/ contractor training materials
* Ensure vendors/contractors attest to maintaining necessary licensing and obtaining appropriate permits.
* Audit vendors/contractors for compliance
* Conduct engineering reviews of all custom projects
* Review all deemed applications for qualified projects
* Inspect 5% of all projects to ensure installation meets the program’s expectations

## Disadvantaged Worker Plan[[9]](#footnote-8)

Cascade recognizes the importance of working at the program level to expand job access to disadvantaged workers. The program includes the following:

* recruit for workforce diversity, ensuring the language in our job posts is designed to attract a broad, qualified candidate pool.
* recognize and pursue the potential for workforce development opportunities within SMART Industrials.

# Supporting Documents

## Program Manuals and Program Rules

See Attachment 1 – Policy and Procedures Manual

## Program Theory

See Attachment 2 – Program Theory

## Process Flow Chart

See Attachment 3 – Process Flow Chart

## Incentive Tables and Workpapers

See Attachment 4 – Incentive Tables for additional details

## Quantitative Program Targets

See Attachment 5 – Quantitative Program Targets

## Diagram of Program

See Attachment 6 – Diagram of Program

## Measurement & Verification (M&V)

See Attachment 7 – Evaluation, Measurement & Verification

## Normalized Metered Energy Consumption (NMEC)

See Attachment 7 – Evaluation, Measurement & Verification

SDG&E SMART (Savings, Measurement, Assistance, Rebates, Training) Industrials

Attachment 1 – Policy and Procedures Manual

2.16.2023

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# Program Overview

The SMART (Savings, Measurement, Assistance, Rebates, Training) Industrials Program offers a suite of energy efficiency services to SDG&E’s entire industrial sector, including industrial customers served by the Port of San Diego, tailored to their business type, size, and financial needs. SMART Industrials leverages strategic energy management (SEM), training for customers and vendors, high-quality engineering support, attractive incentives and financing options, and an innovative path to cost-effective energy savings for the significant number of small and medium businesses (SMBs) within SDG&E’s industrial base.

SMART Industrials is implemented by Cascade Energy Inc. (“Cascade”) under contract to San Diego Gas & Electric (SDG&E). Table 1 shows key dates for the program.

Table 1 Key Program Dates

|  |  |
| --- | --- |
| Milestone | Date |
| Advice Letter Approval | January 4, 2023 |
| Begin program implementation activities | February 1, 2023 |
| End program implementation activities | December 31, 2026 |
| Final date for program implementation activities | February 29, 2028 |

SMART Industrials involves three key parties:

* **Participant (Applicant):** An eligible industrial ratepayer who is applying for incentives through the SMART Industrials program.
* **Implementer (Cascade Energy):** SMART Industrials is implemented by Cascade Energy under contract to SDG&E.
* **Program Administrator (SDG&E)** At the direction of the California Public Utilities Commission (CPUC), SDG&E serves its customers with a portfolio of energy efficiency and demand response programs, including third-party programs such as SMART Industrials.

# Program Eligibility

## Participants

SMART Industrials will offer a suite of energy efficiency services to SDG&E’s entire industrial sector – including industrial-sector tenants at the Port of San Diego – tailored to their business type, operation size, and financial needs. To achieve SDG&E’s energy savings targets, SMART Industrials will focus on comprehensive projects at medium and large participant sites. Additional details on target participant segments are provided below:

#### Large Manufacturing

Includes larger manufacturers such as aerospace and defense. In SDG&E’s territory, this segment represents a small number of accounts with high energy savings potential. Large manufacturing facilities, in areas such as Otay Mesa and El Cajon, are typically where our engineers uncover “mega-project” potential. Common end uses include industrial processes, dust collection, welding, compressed air, motor systems and machine drives, refrigeration, boiler and steam systems, lighting, and HVAC.

#### General Manufacturing

Includes smaller manufacturers such as commercial bakeries and breweries, machine shops, and plastics manufacturers. This segment reflects the largest number of projects in the industrial sector in SDG&E territory, but the cost of savings acquisition is high due to the smaller-sized opportunities. Common end uses include lighting, refrigeration, HVAC, machine drives, and boiler systems. General and light manufacturing facilities are located throughout the western half of the county, with concentrated areas in El Cajon, north Miramar, and between Oceanside and Escondido.

#### Biotech, Laboratories, and Research and Electronics/Telecommunications

Together these segments represent only a combined 8% of accounts in SDG&E territory. However, these customers – which include numerous biotech, high-tech, and electronics manufacturers primarily located in and around La Jolla – typically have significant, concentrated gas use. Based on our experience delivering SEM to dozens of these facility types through DSM programs across North America (including SDG&E’s SEM program), these customer segments are generally progressive with clearly stated corporate sustainability goals, making them an ideal fit for SEM or SEM for SMB. Common end uses in these segments include HVAC, chillers, lighting, low-temperature freezers, boilers and steam, and treated water use.

#### Port of San Diego Industrial-Sector Tenants

Include both larger manufacturers such as shipbuilding, ship repair, and turbine and chemical manufacturing; as well as smaller businesses related to ship outfitting, building, servicing, and repair, plus seafood refrigeration and brewing. It also includes large, refrigerated warehouses which could benefit greatly from Cascade’s refrigeration expertise. Cascade’s current and past SEM work with Port tenants give us a good start on SEM recruitment from this customer base. Common end uses include industrial processes, dust collection, welding, motor system and machine drives, compressed air, hot water and steam systems, lighting, refrigeration, boiler and motor systems, and HVAC.

Specifically, SMART Industrials serves participants with the following designation codes listed in, but not limited to, Table 2 from the North American Industry Classification System (NAICS):

Table 2 Eligible Participant NAICS Codes for Enrollment in SMART Industrials

|  |  |
| --- | --- |
| NAICS Code | Segment |
| 31-33 | Manufacturing |
| 21 | Mining |
| TBD | Any other NAICS codes designated as industrial by SDG&E |

Eligibility requirements include:

* Designation as an industrial-sector customer by SDG&E.
* Current customer of SDG&E, verified by their most recent utility bill.
* Customer must be paying the public purpose program surcharge.

Additionally, businesses will be categorized by the following sub-criteria within each market segment:

* Large Customer: demand > 200 kW
* SMB Customer: demand < 200 kW

#### SEM

Both small and large customers will be considered for SEM participation. Customer eligibility for SEM will be evaluated based on the following factors:

* Interest in SEM and commitment to at least one cycle (two year commitment)
* Ability to staff the energy team required for SEM
* Number of subsystems and annual energy use, kWh and therms

## Measures

The deemed and custom measures in Table 3 are included in the approved program catalog. Any measure additions, deletions and updates to the program catalog must receive written approval from SDG&E prior to implementation.

Table 3 Ag-STAR Approved Measures

### Deemed

Deemed measures are prescriptive measures supported by CPUC-approved statewide measure packages that define energy savings values by building type, climate zone, etc. Deemed measures must be listed in the current electronic Technical Resource Manual (eTRM).

If technologies are identified that are well-suited to the deemed platform and the measure is not active in the eTRM, and Statewide Measure Packages are not available for the Measure, SMART Industrials will contribute to the development and approval of new deemed measures and expand its deemed portfolio accordingly with the approval of the SDG&E Program Manager. When developing Measures, Cascade will follow the latest version of the Statewide Deemed Rulebook found on the Cal TF website as well as all Cal TF requirements and guidelines, including the Measure Development and Peer Review QA/QC guidelines.

### Custom

Non-deemed (“custom calculated”) measures (developed for a specific project) shall be submitted to SDG&E and require SDG&E Engineering Support review and written approval before installation. For such measures, Cascade shall follow the Statewide Custom Project Guidelines and all statewide documentation and workbooks outlined. Cascade shall work with SDG&E to ensure that the SW Custom Guidelines are being followed and adhered to. Any non-workpaper customized measures shall be submitted in the Statewide Custom Projects Review Guidance documents format as posted on the public CPUC website.

### Site-Specific NMEC

All savings claimed through the Normalized Metered Energy Consumption (NMEC) platform will follow the latest version of the CPUC NMEC Rulebook. Full M&V details are outlined in Attachment 6:

Evaluation, Measurement and Verification Plan.

### SEM

In addition to the services listed above, participants who enroll in Strategic Energy Management will benefit from additional educational modules, peer to peer learning and accountability groups with similar industrial facilities, and employee engagement resources to drive additional energy savings across the facility.

## Contractors

SDG&E authorizes Cascade to utilize the Subcontractors in 3 in performing and providing the Services. This is not a direct install program and participants are able to select any qualified installer of their choice.

Table 3 SDG&E Approved Subcontractors for SMART Industrials

|  |  |
| --- | --- |
| Subcontractor Business Name | Work Description |
| Burch Energy Services | Technical engineering services |

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

Upstream and midstream incentives are not applicable for SMART Industrials.

# Additional Services

In addition to facilitating incentives, rebates, and financing for industrial-sector customers, SMART Industrials program design includes several innovative features, including a large or small customer track based on energy demand. Additional program elements include Training Initiated Engagement(TIE) workshops, segment-specific online training videos, on-bill financing (OBF) and a third-party financing options, and participant access to Cascade’s Energy Sensei energy management platform. These are all part of the general SMART Industrials program delivery and no further additional services are provided.

# Audits

Outside of the M&V processes outlined in Attachment 6 – Measurement and Verification Plan, no additional audits are required.

# Quality Assurance Provisions

Cascade is committed to providing quality services that meet the performance, cost, and schedule requirements of our clients and participants. Our processes are established on practices, tools, and software that generate consistently reliable results. Our workflow management tools integrate fundamental management and communication techniques, technical processes, and tools into an approach focused on the quality of deliverables. Cascade’s team concentrates on continuous improvement of business processes, participant satisfaction, and continuous quality measurement of delivered services, while identifying opportunities for process improvements.

The success of Cascade’s programs and projects are made possible by adherence to proven quality standards and established QA methods that enable us to offer our clients:

* Energy efficiency and sustainability programs that use mature, well-defined, and repeatable processes.
* Use of proven measurement and verification (M&V) techniques.
* Use of beneficial, cost-effective, IT, data communications, and marketing tools and methodologies.

## Quality Assurance Plan Purpose

Cascade has developed the following quality assurance (QA) plan to demonstrate how our team will monitor, assess, and ensure adherence to processes, procedures, and standards to determine the quality and on-time delivery of all deliverables and services for the program. This plan will serve as the blueprint for maintaining consistent quality through all components of the project and in each task.

The QA plan documents the procedures by which the team assesses performance for all aspects of the program against contractual requirements. The plan describes the approach for activities, including program tracking and reporting, process reviews, program audits, project engineering analyses and reports, procedures, and techniques for implementing and sustaining overall quality for the program.

## Quality Assurance Plan Scope

Cascade has created a QA framework to form the basis of the complete quality management approach and strategy. The processes defined in the plan will be leveraged to implement quality in all aspects of performance.

The objective of the QA plan is to describe the roles and responsibilities and the policies and procedures that ensure consistency and quality throughout the projects. The objective enables the QA team to achieve critical measurable results for the program such as:

* **Predictable Results:** The QA plan is to ensure that deliverables and services are produced in an efficient, effective, reliable, and predictable manner that will consistently produce results compliant with the contractual requirements of the program.
* **Error Prevention:** The QA plan prevents the introduction of errors into deliverables and services. Any errors that are found undergo analysis and subsequent action to preclude reintroduction of the error. This aspect of the QA plan includes the structured approach to pursuing continuous improvement in all aspects of the program.
* **M&V Documentation:** The QA plan ensures a structured approach to the defining, recording, and storing of documentation related to requirements, approvals, reviews, tests, decisions, actions, events, and problems and improvement measures to support verification, validation, and traceability.
* **Participant Satisfaction:** The QA plan ensures the participant receives the best possible deliverables and services. Participant satisfaction surveys will be conducted so that participants may comment on the program and Cascade. Surveys will be conducted either by mail, email or by telephone. The results of the survey will be entered into the database management tool.
* **Continuous Improvement:** Feedback from all the above is used in an ongoing effort to improve the program’s processes. Results from the survey will be quantified and shared with the program sponsor.

## Quality Assurance Methodology

For each program or project, the QA team will be consulted on the approach to baseline operations and how measure implementation will be confirmed. Primarily, for measures needing custom calculations, energy savings will be based on the baseline performance data collected by field measurements by the Cascade team.

The QA team will be apprised of the analysis approach. When energy savings analysis is completed for each project, the analysis will be independently reviewed by the QA team to confirm agreement with the savings estimates and approach to the savings estimates for the measures. The review methodology will be established to examine processes against quality factors using Cascade’s workflow management tools, such that the QA checks and results must be recorded for the project to move to the next stage. Examples of quality factors include:

* **Correctness:** The extent to which a deliverable satisfies the requirements and the stated objectives.
* **Timeliness:** The deliverable is provided when required.
* **Reliability:** The extent to which a deliverable is provided on a consistent basis.
* **Productivity:** The number of resources to correctly produce the deliverable, including the relationship between the amounts of time needed to accomplish work and the effort expended.

Cascade will maintain a clear record of all project findings, including on-site notes, building and equipment data, and operating characteristics. Secondary review of randomly selected projects will periodically check the QA process to ensure that:

* The QA process has been followed, verified by checking that all data and required checks are recorded.
* The project results are reasonable, verified by recalculating results using a secondary methodology such as engineering calculations.
* Project documentation is complete.

# Other Program Metrics

## Key Performance Indicators (KPIs)

Table 4 and Table 5 identify the Key Performance Indicators (KPIs) for SMART Industrials

Table 4 Key Performance Indicators for 2023

|  |  |
| --- | --- |
| **Category** | **Description** |
| **Program Performance:** kWh Savings (net 1st Year savings) | Year to date, % achieved of net 1st Year kWh savings required under the Agreement based on planned savings acquisition rate for the reporting year |
| **Program Performance:** kW Savings (net 1st Year savings) | Year to date, % achieved of net 1st Year kW savings required under the Agreement based on planned savings acquisition rate for the reporting year |
| **Program Performance:** Therm Savings (net 1st Year savings) | Year to date, % achieved of net 1st Year Therm savings required under the Agreement based on planned savings acquisition rate for the reporting year |
| **Program Performance:** TRC Ratio | Program’s TRC ratio based on measure installations and compensation to date, including any accruals that have posted (at 100% compensation rate\*) |
| **Port Tenant Penetration** | Year to date, % of achieved net 1st Year energy savings for tenants of the Port of San Diego (average of kWh, kW, and Therm percentages) |
| **Compliance/Program Performance (Energy Savings and Budgets):** Reporting Accuracy | Average % variance, year to date, between the forecasted energy savings and budget figures at the start of the monthly reporting period and actual figures invoiced the following month |
| **Compliance/Program Performance:**  Program Inspections | Year to date, % of COMPANY inspections that pass on the first attempt. COMPANY will inspect a percentage of projects to ensure accuracy and validate savings |
| **Marketing:** Enrollment of Customers | # of customers year to date who take action as defined in Attachment 5 Marketing Plan divided by # of customers forecasted per the Marketing Plan. |
| **Customer Satisfaction:** Survey Scoring | Average score of customer satisfaction surveys and SEM workshop evaluations administered by Contractor year to date (Assuming a 5-point scale where 5 is highly satisfied). Survey shall include a question that assesses if the customer’s understanding of IDSM, DR, and water efficiency opportunities have increased after participation in SMART Industrials. |
| **Customer Satisfaction:** Complaints Received | # of complaints received year to date divided by # of customers participating in Program year to date |
| **Compliance:** HTR/DAC Penetration | Year to date, % of achieved energy savings in HTR and/or DAC segments (average of kWh, kW, Therm percentages) |
| **Compliance:** Diverse Business Enterprise | Year to date, DBE spending as percent of total DBE spend commitment, split on an even pro rata basis by quarter |

Table 5 Key Performance Indicators for 2024-2026

|  |  |
| --- | --- |
| **Category** | **Description** |
| **Total System Benefit (TSB):** Expressed in dollar terms of the lifecycle energy, capacity & GHG benefits. | To date, % achieved of total TSB dollar value under the Agreement based on planned TSB acquisition rate for the reporting year |
| **Program Performance:** TRC Ratio | Program’s TRC ratio based on measure installations and compensation to date, including any accruals that have posted (at 100% compensation rate\*) |
| **Port Tenant Penetration** | Year to date, % of achieved net 1st Year energy savings for tenants of the Port of San Diego (average of kWh, kW, and Therm percentages) |
| **Compliance/Program Performance (Energy Savings and Budgets):** Reporting Accuracy | Average % variance, year to date, between the forecasted energy savings and budget figures at the start of the monthly reporting period and actual figures invoiced the following month |
| **Compliance/Program Performance:**  Program Inspections | Year to date, % of COMPANY inspections that pass on the first attempt. COMPANY will inspect a percentage of projects to ensure accuracy and validate savings |
| **Marketing:** Enrollment of Customers | # of customers year to date who take action as defined in Attachment 5 Marketing Plan divided by # of customers forecasted per the Marketing Plan. |
| **Customer Satisfaction:** Survey Scoring | Average score of customer satisfaction surveys and SEM workshop evaluations administered by Contractor year to date (Assuming a 5-point scale where 5 is highly satisfied). Survey shall include a question that assesses if the customer’s understanding of IDSM, DR, and water efficiency opportunities have increased after participation in SMART Industrials. |
| **Customer Satisfaction:** Complaints Received | # of complaints received year to date divided by # of customers participating in Program year to date |
| **Compliance:** HTR/DAC Penetration | Year to date, % of achieved energy savings in HTR and/or DAC segments (average of kWh, kW, Therm percentages) |
| **Compliance:** Diverse Business Enterprise | Year to date, DBE spending as percent of total DBE spend commitment, split on an even pro rata basis by quarter |

SDG&E SMART (Savings, Measurement, Assistance, Rebates, Training) Industrials

Attachment 2 – Program Theory

2.16.2023

# Program Theory and Logic Model

Figure 1 outlines the program goals, barriers, and activities for overcoming the barriers. The figure visually explains the underlying theory supporting the sub-program intervention approach.

Diagram

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Figure 1 SMART Industrials Program Theory and Logic Model

SDG&E SMART (Savings, Measurement, Assistance, Rebates, Training) Industrials

Attachment 3 – Process Flow Chart

2.16.2023

# Process Flow Chart

Figure 1 illustrates program flow for both large and small customers enrolled in SMART Industrials.

A picture containing graphical user interface

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Graphical user interface

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Figure 1 SMART Industrials Program Flow

SDG&E SMART (Savings, Measurement, Assistance, Rebates, Training) Industrials

Attachment 4 – Incentive Tables

2.16.2023

# Incentive Structure

For SEM, custom, and NMEC projects, SMART Industrials incentives are calculated as a function of electric and natural gas savings claims on a net lifecycle basis per CPUC guidance[[10]](#footnote-9).

Table 1 SMART Industrials Base Incentive Levels

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| SMART Industrials Incentives | NMEC1 | | SEM1 | | Custom – AR2 | | Custom – AOE2 | | Custom – NR2 | | Deemed7 | |
| $/kWh | $ | 0.02 | $ | 0.01 | $ | 0.08 | $ | 0.08 | $ | 0.08 | $ | 0.05 |
| $/kW | $ | 0 | $ | 0 | $ | 0 | $ | 0 | $ | 0 | $ | 0 |
| $/therm | $ | 0.20 | $ | 0.10 | $ | 1.00 | $ | 1.00 | $ | 1.00 | $ | 1.00 |
| Milestone Incentives6 | – | | SEM  $3,000 | SMB  $1,500 | – | | – | | – | | – | |
| Incentive Cost Cap | None1 | | None1 | | 75% of ARC3 | | 100% of FMC3 | | 100% of IMC3 | | 75% of IMC3 | |

*Notes:*

1. NMEC & SEM participants also receive custom incentives ($0.08/kWh, $1/therm, up to 75% of project cost) in addition to SEM incentives for approved projects in excess of $20,000 in cost. Pre-approval by Cascade Energy is required.
2. AR = Accelerated Replacement, AOE = Add-On Equipment, NR = Normal Replacement
3. FMC = Full Measure Cost, IMC = Incremental Measure Cost, ARC = Accelerated Replacement Costs
4. All incentive rates are reduced by 50% for savings in excess of 500,000 kWh and/or 50,000 therms.
5. Incentives greater than $100k are determined on a per project basis, based on program budget and cost-effectiveness.
6. Milestone incentives are paid to SEM participants based on active participation in key SEM activities.
7. Deemed rates apply to all deemed measures not specified in Table 2.

The following table provides a summary of the deemed measure offerings and associated workpapers. Custom offerings include any cost-effective measure not eligible for under the deemed platform. Custom offerings using a meter-based savings approach will require pre-screening to determine whether a Normalized Metered Energy Consumption (NMEC) or Strategic Energy Management (SEM) approach is suitable for the customer.

Table 2 Measure Specific Deemed Rebates

|  |  |  |  |
| --- | --- | --- | --- |
| Measure | Requirements | Rebate Amount | Workpaper ID |
| Efficient hot water boiler | ≥ 85% combustion efficiency (Tier 1) or  ≥ 83% Thermal Efficiency | $1.50 per MBH | SWWH008 |
| Efficient hot water boiler | ≥ 90% combustion efficiency (Tier 2) or  ≥ 88% thermal efficiency | $4.00 per MBH | SWWH008 |
| Efficient steam boiler | ≥ 83% combustion efficiency or  ≥ 81% thermal efficiency | $3.00 per MBH | SWWH008 |
| Feedwater boiler economizer | 81.4% thermal efficiency | $1.00 per MBH | SWPR007 |
| Condensing boiler economizer | 87.2% thermal efficiency | $3.00 per MBH | SWPR007 |
| Pipe Insulation | Hot water or steam, indoor or outdoor | $3 per linear ft. + $15 per fitting | SWWH017  SWWH018 |
| Dust Collection Fan VFDs | Fan motors from 10 to 150-hp | $75 per hp | SWPR005 |

SMART Industrials offers on-bill financing through SDG&E (for eligible accounts), coupled with incentives. On-Bill Financing (OBF) can drive energy-efficiency projects that do not meet a customer’s rate of return threshold with incentives or rebates alone, and the combination of OBF with incentives and rebates has the potential to accelerate projects with faster payback periods. Third party financing is also available for eligible customers through a program partner.

SDG&E SMART (Savings, Measurement, Assistance, Rebates, Training) Industrials

Attachment 5 – Quantitative Program Targets

2.16.2023

# Quantitative Program Targets

#### Program Participation

Our program participation goals are as follows:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Customer Account Category | 2023 | 2024 | 2025 | 2026 | Four-Year Total |
| New Large Accounts | 40 | 70 | 85 | 75 | 270 |
| New SMB Accounts | 30 | 50 | 64 | 56 | 200 |
| Total Accounts | 70 | 120 | 149 | 131 | 470 |

Program participation is defined as customers who:

* Participate in a Training Initiated Engagement (TIE) workshop event
* View an online training video
* Enroll in an SEM Program
* Complete the appropriate documentation to begin a deemed, custom, or NMEC project:
  + Deemed Application Form
  + Custom Preliminary Project Feasibility Study (by Cascade)
  + NMEC Enrollment Agreement

#### Budget Allocations, Anticipated Savings, and Anticipated TRC

The budget, savings, and TRC values set forth in the contract are related to the program, of which SEM is a component part. Overall, it is a highly cost-effective program designed to deliver a four-year average TRC of 1.28 with a total EE budget of $15,831,757. The following table shows the SEM targets by program year (PY) for each year the contract is in effect. Targets were generated from Cascade’s forecast which was based on the Cost Effectiveness Tool (CET) and are subject to change. Per D.15-10-028, “PAs can change the implementation plans as needed without further review, and the version on the publicly available web pate will always be current.”[[11]](#footnote-10)

Table 1 SEM Targets by Program Year

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Program Year (PY)** | **Anticipated First Year KWh** | **Anticipated First Year Net kW** | **Anticipated First Year Net Therm** | **Budget Allocation** | **Anticipated TRC Ratio** |
| 2023 | 4,470,030 | 447 | 53,333 | $1,756,696 | 1.39 |
| 2024 | 6,930,587 | 693 | 38,619 | $1,595,096 | 1.25 |
| 2025 | 5,285,384 | 529 | 43,721 | $1,046,182 | 1.62 |
| 2026 | 5,101,628 | 510 | 42,154 | $1,062,264 | 1.65 |
| **Total** | **21,787,629** | **2,179** | **177,827** | **$5,460,238** | **1.45** |

#### SEM Program Participation

#### Table 2 Expected SEM Program Participation

|  |  |
| --- | --- |
| **Cohort** | **Participants** |
| SEM Cohort A | 7 |
| SEM Cohort B | 8 |
| SEM Cohort C | 8 |
| SEM for SMB Cohort D | 20-30 |
| Future Cohorts | TBD |

#### Hard to Reach (HTR) Customers and Disadvantage Communities (DACs) Key Performance Indicators (KPI)

The program will make an emphasis to target HTRs and DACs. Accountability for these efforts is built into the program KPIs, which are shown below.

#### Table 3 HTR/DAC Penetration KPI

|  |  |  |
| --- | --- | --- |
| **Compliance:** HTR/DAC Penetration | Year to date, % of achieved energy savings in HTR and/or DAC segments (average of kWh, kW, Therm percentages) | 0: Less than 2%  1: 2 – 4%  2: 5 – 6%  3: 7 – 8%  4: greater than 8% |

SMART (Savings, Management, Assistance, Rebates, Training) Industrials

Attachment 6: Diagram of Program

2.16.2023

# Diagram of Program

Figure 1 summarizes how SMART Industrials fits within SDG&E’s customer program portfolio and the statewide energy efficiency landscape, including connections with marketing and outreach, workforce training, emerging technologies, and Integrated Demand Side Management (IDSM) programs.

Text, timeline

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Figure 1 Diagram of Program for SMART Industrials

SDG&E SMART (Savings, Measurement, Assistance, Rebates, Training) Industrials

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

2.16.2023

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

## Deemed Platform

We will make all applicable measures from the following Statewide Measure Packages available to SMART Industrials participants, as well as any other relevant measures that we identify during the negotiation and start-up phases. Our program design includes developing new Statewide Measure Packages and deemed measures. We will incorporate new measures if and when they become available but deemed savings claims will always be based on CPUC-approved Statewide Measure Packages. Table 1 lists the most commonly expected measures.:

Table 1 Most Common Industrial Deemed Measures for SMART Industrials

|  |  |
| --- | --- |
| Statewide Measure Package Reference | Measure Description |
| SWCA001-02 | VFD on Air Compressors |
| SWHC009-02 | Unoccupied Fan Controls |
| SWHC024-02 | Cogged V-Belt for HVAC Fans |
| SWWH006-06 | Tankless Water Heaters |
| SWWH017-02 | Pipe Insulation |
| SWWH018-02 | Tank Insulation |
| SWPR003-01 | Steam Traps |
| SWCR017-02 | HE Ultra Low Temperature Freezers |
| SWWH008-01 | Process Boilers: Steam and Hot Water |
| SWPR007-01 | Boiler Economizers: Feedwater and Condensing |
| SWWH007-04 | Commercial Storage Water Heaters |

To verify eligibility, our staff will review each application for completeness, accuracy, and alignment with program specifications and measure requirements listed in applicable Statewide Measure Packages. Applicants submit a simple, intuitive, single-page rebate form, and our staff completes sections of the application upon a customer request. The customer must also submit project invoices, including documentation that the invoice was paid (paid stamp, accounting software snip, etc.). This approach streamlines application processing and reduces the number of rejections and rework.

Depending on application volume, we will verify either all deemed projects or a statistically rigorous sample. Sampling would follow CPUC California Energy Efficiency Evaluation Protocols and verify ant confidence levels and precision, respectively, of 90/10 per measure type for different customers and 90/20 for the same measure type with multiple installations for the same customer. These sampling amounts are shown in Table 2 (values were calculated with Equation 11 and 12 from the Uncertainty Assessment for IPMVP EVO 10100-1:2019). Verifications will validate equipment and installation, ensure it is functioning as intended, document installations with photos, and confirm that equipment specifications match the incentive application. Verification will be conducted remotely when feasible. In order to maintain an adequate sampling rate, the majority of initial projects will be sampled, and then fewer future projects will be sampled moving forward, always maintaining the minimum sample size defined below. While we do not intend to measure savings from deemed projects, we will track data such as measure cost to inform future Statewide Measure Package updates.

Table 2 Deemed Measure Statistical Sampling Criteria

|  |  |  |
| --- | --- | --- |
| Statistical Sampling Criteria | | |
| **Precision** | 20% | 10% |
| **Confidence** | 90% | 90% |
| **Population Size** | **Sample Size** | |
| 4 | 3 | 4 |
| 8 | 5 | 7 |
| 12 | 7 | 10 |
| 16 | 8 | 13 |
| 20 | 9 | 15 |
| 30 | 11 | 21 |
| 40 | 12 | 25 |
| 50 | 13 | 29 |
| 60 | 13 | 32 |
| 70 | 14 | 34 |
| 80 | 14 | 37 |
| 90 | 14 | 39 |
| 100 | 14 | 40 |
| 200 | 16 | 51 |
| 300 | 16 | 55 |
| 400 | 16 | 58 |
| 500 | 16 | 60 |
| >500 | 16 | 60 |

## Custom Platform

The Cascade Team will embed M&V at the earliest stages of customer engagement by focusing on and documenting influence starting in the customer acquisition phase. SMART Industrials’ approach is designed to overcome real customer barriers to project implementation, laying a strong basis for attributable savings. Influence will be documented in the project application, which will help justify higher NTG values, if applicable. Influence documentation will include:

* Identification of any pre-planned projects and/or existing barriers to implementation, which will consider both leads from other program as well as customers’ internal efforts.
* Documentation of any previously identified projects, along with reasons implementation has not yet occurred. As we work through project justification, we document the influence of SMART Industrials personnel brought to eliminate these project barriers.
* Consideration of factors including Title 24 and documented ISPs. We always ask customers the age of existing equipment for all potential projects and document items like equipment nameplates with dates of manufacture. Our engineers are knowledgeable about EULs for equipment we commonly encounter and can determine when the equipment has reached the end of its useful life. If it has not, or if equipment is to-code or to-ISP, the project is an accelerated replacement and will have dual baselines. If equipment reached the end of its useful life, it will be treated as a normal replacement and code, or ISP will be used as the baseline. All this information will be compiled and included as part of the project documentation submittal to SDG&E.

When necessary, Cascade will draw upon its years of industrial sector knowledge to create and document appropriate ISPs in accordance with SDG&E guidance.

Custom M&V verifies the baseline equipment energy usage and that the intended changes were made and measures/documents the resulting energy and demand savings. For projects requiring custom calculations, the measurement and verification process for the equipment to be installed will be detailed in the project-level M&V Plan submitted as part of the Project Feasibility Study (PFS). Each project-level M&V plan will be developed based on the available data, feasible data logging, anticipated engineering analysis approach, load variations, and seasonal variations as appropriate. Project-level M&V plans will adhere to IPMVP, CPUC, and SDG&E guidelines. The CPUC guidelines are constantly being revised and the SMART Industrial program will incorporate any changes into the program as soon as they go into effect. The SMART Industrials team will have representatives participating in applicable CPUC Custom Stakeholder working groups to improve the platform and to stay up to date on program changes. The SMART Industrials team will regularly meet with the SDG&E Engineering Team where projects and M&V plans will be informally discussed.

Cascade may utilize CPUC approved custom calculation tools, with approval from SDG&E. Cascade may also develop new tools which would go through the typical approval process by SDG&E and the CPUC.

### Pre-Install

* Determine appropriate baseline.
* Determine IPMVP savings methodology (A, B, C, or D)
* Determine pre-install energy usage by measuring for an appropriate duration or estimating based on nameplate values. Also measure key energy drivers (temperature, production, etc.) as necessary based on savings methodology and measurement scope. Collect photos/screenshots of baseline equipment and relevant operational information.
  + Pre-install energy usage would be measured with standard utility approved methods, such as gathering existing monitored data or installing appropriate transducers and data loggers.
* Document and account for any non-routine events (NREs) in pre-install measurement period.
* Account for non-IOU supplied energy sources in accordance with the CPUC’s *Energy Efficiency Savings Eligibility at Sites with non-IOU Supplied Energy Sources – Guidance Document.* For custom projects at industrial sites, an hourly kWh and/or Therm calculation approach will be used to ensure that only energy savings during the hours that there is grid usage will be claimed and the savings will be no greater than the total grid usage for that hour. For deemed measures, this analysis is done on an annual basis (rather than hourly). NMEC projects will be assessed at the interval the energy model is using (often daily or monthly).
* Annualize pre-install measured data to an annual operating profile and calculate consumption.
* For a normal-replacement baseline, use engineering calculations to apply operating profile to appropriate baseline equipment and operations to obtain baseline energy profile.
* Calculate baseline and upgrade energy based on the pre-install operating profile applied to baseline(s) and an engineering estimate of upgraded equipment performance.
* Calculate energy savings as: *Energy Savings = Baseline Energy – Upgrade Energy.*
* Document all project influence sources and screen out free riders. Document contact information for site decision makers and notify them that ex-post reviewers will be contacting them after project installation.
* Document any expected future projects/installations that could impact ex-ante savings assumptions.

### Post-Install

* Verify installation of equipment. Collect photos of installed equipment.
* Determine post-install energy use by following the M&V plan listed in the Project Feasibility Study (PFS).
  + Post-install energy would be measured with the same methods used in the pre-install case, unless the upgrade included additional metering that could provide the same data.
* Document and account for any NREs in post-install measurement period.
* Validate similarity of pre- and post-install conditions and profile. Conduct additional data collection if pre-install and post-install measurements show substantially different operation.
* Calculate baseline and upgrade energy based on the post-install operating profile applied to baseline and upgrade equipment.
* Calculate energy savings as: *Energy Savings = Baseline Energy – Upgrade Energy.*

## Program/Process Evaluation

SDG&E will conduct independent EM&V activities, which may include the following:

* Inspection and audit of incoming documentation for accuracy and completeness
* Review of savings claims submittals
* Inspections of customer installations to ensure proper equipment operation and configuration and to confirm that installations comply with technical and program requirements

In addition to these activities, multiple key performance indicators, which are evaluated quarterly, evaluate Cascade’s performance.

# NMEC Platform

Cascade has substantial experience designing and implementing NMEC projects in the context of SEM and in non-SEM programs (such as PG&E ISOP). For SEM projects, Cascade’s M&V process follows the California Industrial SEM M&V Guide.

For site-level NMEC, Cascade follows a rigorous NMEC M&V approach that aligns with evolving statewide guidance, including the latest version of CPUC’s NMEC Rulebook. Our NMEC M&V plan will address criteria specified by the Rulebook as follows:

## Appropriateness of NMEC

NMEC eligibility per the 2020 NMEC Rulebook includes “Site-level NMEC projects in industrial buildings are permissible, to the extent they are similar to one that would be carried out in a commercial building.” Accordingly, SMART Industrials NMEC projects may be:

* Industrial facilities that are more commercial/building like in terms of their operations and patterns of energy use, such as warehouses and office spaces associated with industrial facilities.
* Loads and processes in facilities that are substantially similar to those found in commercial buildings, such as lighting, space heating/cooling and water heating. For these projects, we will use submeter data as necessary to isolate eligible usage or normalize for production loads such that only savings from building like measures are claimed.

We hope that these limitations will evolve in the future, further expanding opportunities for industrial facilities to achieve NMEC savings. We will modify our program approach if that happens; until then, we intend to work with SDG&E reviewers and statewide precedents to establish commonly understood eligibility space within the above building-type loads.

## NMEC Approach (Site-Level or Population-Level)

SMART Industrials will use a **Site-Level NMEC** approach.

## Eligible Customer Population

As described above, eligibility will be governed by the latest version of the NMEC Rulebook. Commercial and commercial-like loads within the industrial-sector umbrella will be eligible. Any changes to the NMEC Rulebook will trigger a review of all in-process NMEC projects to confirm ongoing eligibility prior to the effective date of a new Rulebook. Where eligibility may still be unclear, we will work with SDG&E to determine whether seeking an Early Opinion from the CPUC on customer eligibility is appropriate.

## Strategies to Target High Savings

Pre-screening will assess the project’s ability to exceed 10% savings. SMART Industrials’ training and coaching strategies will help customers identify and implement comprehensive projects. Our engineers and technicians typically identify and work with customers to implement 10-20 distinct measures per project. Savings are driven by implementing projects early in the NMEC engagement, once baseline data has been collected, but often prior to full project approval.

## Analytical Methods and Tools

SMART Industrials will manage development and documentation of regression model and savings quantification within Excel. Spreadsheets will use industry standards for multivariate linear regression analyses, such as Microsoft Excel’s ‘linest’ function. Completed models will be loaded into Energy Sensei to streamline data management, performance monitoring, and progress visualization. In compliance with SDG&E open-source expectations, Energy Sensei licenses will be provided to any reviewer needing access.

Baseline and performance period models will be developed to account for the energy usage of each facility. Model selection is not always simply based on the best statistics; a model is selected based on a combination of model statistics, ease of data acquisition, physical conditions at the site, and what makes intuitive sense to the facility operators.

Energy savings within the project boundary will be calculated using a model based on performance period data under normalized conditions. Performance period models will use the same modeling approach as was used for the baseline model development. Energy savings within the project boundary will be calculated by applying the following equation:

*Energy Savings = Normalized Baseline Period Energy Use – Normalized Performance Period Energy Use*

Where:

* Normalized Baseline Period Energy Use = energy consumption calculated using the Baseline Model and normalized data for each independent variable. Normalized weather data will use a Typical Meteorological Year dataset, which aligns with the applicable CPUC-approved Avoided Cost Calculator (CALEE 2018 TMY dataset for the nearest weather station).
* Normalized Performance Period Energy Use = energy consumption calculated for the performance period using the performance period model, adjusted for non-routine events as necessary.

Models will be developed using an Excel-based workbook template, which streamlines the process of testing candidate variables for statistical significance and comparing and documenting performance of hypothesis models. Once a model is selected, it will be loaded into Cascade’s Energy Sensei software to facilitate customer communication, sharing, and ongoing tracking.

## References for Analytical Approach

Cascade’s analytical approach follows CPUC, LBNL, ASHRAE, and IPMVP guidance.

## Implementation Examples for Analytical Approach

Cascade’s analytical approach has been refined through usage in SEM program including those of SDG&E, SoCalGas, and SCE, plus NMEC projects within PG&E ISOP.

## Key Data for Savings Calculations

Most models will use daily data for all dependent and independent variables. Data will vary for each project. Daily or weekly SDG&E usage data will typically serve as the dependent variable, though in some cases, submeter data may be used instead. Independent variables may include, but will not be limited to:

* Ambient temperature: Energy Sensei downloads site-specific dry-bulb and wet-bulb data through a third-party service that aggregates data from multiple NOAA sources.
* Facility schedules: SMART Industrials’ coaches will confirm customer operating schedules with respect to weekends, holidays, and/or seasonal operations.
* Occupancy or production: In some cases, occupancy or production data may be obtained from a customer system of record for use in an NMEC model. Examples could be number of workers on-site, daily product shipments, or tons of raw material/equivalent inputs.

## Data Collection Plan

Cascade will continue its Privacy Greenlight certification and obtain usage data via Green Button when available, and from Account Executives using a Letter of Authorization or participants when data is not available via Green Button. All data will be uploaded and managed in Energy Sensei. Project-specific Data Collection Plans will be provided in all NMEC Project Applications. Data collection methods and QA/QC checks will be customized based on the predicted uncertainty. For example, projects with predictable buildings using reliable utility meter data may require savings progress to be checked every three to six months. Projects with customer-owned meters, potential non-routine events, and uncertain upfront savings estimates may need to check savings progress each month.

## EUL Determination

A weighted average EUL will be calculated by adding together the product of each measure’s EUL multiplied by its expected savings and dividing by the total expected savings. The forecast weighted average for all recommended measures will be included in the Project Application based on forecast savings, and the updated weighted average EUL for the measures installed and verified will be included in the Final Savings Report. SMART Industrials’ budget and savings estimates conservatively assume a three-year EUL for all NMEC savings which would be applicable to operational and retro-commissioning measures.

## Program Influence Methodology

SMART Industrials will use an NTG ratio of 0.95 for all NMEC projects per CPUC Resolution E-4952. Only projects which have been actively influenced by SMART Industrials will be eligible for savings claims and incentives; facilities with significant changes in operations or normal maintenance of existing equipment during the baseline or reporting periods may not be eligible, or calculation methodologies may have to be developed to isolate and back out corresponding apparent savings. Project influence will be clearly documented for all projects. The following factors may be relevant to the influence demonstration: project developer's engagement and communications with the customer, the customer's decision-making criteria, the project timeline, how the project was initiated, how the measure was identified, the alternative viable options that also meet the customer's needs, and the energy and non-energy benefits. Documentation, with time stamps if applicable, may include marketing materials, training workshop attendance, self-serve video attendance, audits or site visit results, savings or financial calculations shown to customers, email correspondence, meeting minutes, customer internal policies or investment criteria, and/or relevant internal customer communications. Contact information for the customer’s decision makers will be documented and provided so that ex-post reviewers can contact them as needed.

## Statistical Precision (Risk and Savings Uncertainty)

Consistent with California regulatory precedent, all SMART Industrials NMEC claims will meet a Fractional Savings Uncertainty (FSU) standard of within **50% uncertainty at 90% confidence**. This is consistent with all other NMEC programs Cascade is implementing in California and a higher standard than ASHRAE guidance specifies (50% uncertainty at 68% confidence).

Cascade’s M&V protocols on projects with meter-based savings have been employed for over a decade in various programs throughout the country. Cascade also allows for some savings risk when we develop annual program forecasts from NMEC projects. In addition, we constantly monitor savings progress on NMEC projects through Energy Sensei dashboards, giving us enough advance notice to intervene and analyze in case savings trends are not in line with expectations. Above all, in the event that projects do not yield expected savings, Cascade will focus on meeting the planned program goal by identifying more projects, both NMEC and non-NMEC (deemed, custom calculated BRO, and capital projects) depending on the level of shortfall and the time period in which the shortfall needs to be addressed.

## Identification of Non-Routine Events (NREs)

For SEM and NMEC projects, Cascade will follow guidance on adjustment for NREs in the latest versions of the *California Industrial SEM M&V Guide and Rulebook for Programs and Projects Based on Normalized Metered Energy Consumption*, respectively. Per such guides, the method for making the non-routine adjustment and the rationale for that method must be documented in the site-level M&V Report.

Possible NREs will be identified through continuous monitoring of performance data as well as regular project check-ins with the customer. All NREs will be documented in the project M&V Report. Standard thresholds (±3σ of residuals) will apply for identification of significant NREs and for possible updates to regression models, ensuring that directionality is not biased specifically toward positive or negative adjustments.

Baseline data shall also be analyzed to determine the presence of unusual energy use patterns that may be caused by NREs. All suspected NREs should be confirmed with the participant. Confirmed baseline period NREs must be documented in the pre-screening report, with a clear description of how their impacts will be addressed.

During the performance period, the most common method to identify NREs is through visual inspection of the metered energy use data. Time-series charts of energy use data may be used to identify shifts in energy use patterns that may be caused by NREs. If energy use data begins trending significantly outside expected values as determined by the model, an NRE may be present. SMART Industrials staff’s professional judgement will be used to identify NREs, but a situation in which an independent variable departs its baseline observed range by more than ±10% will serve to flag a potential NRE.

## Rationale for Savings <10%

SMART Industrials is not targeting projects with savings less than 10%, but we do not believe a hard eligibility line is appropriate. Use of interval data and advanced modeling methods means that even if fewer measures are installed or if they are not functioning as intended, savings at or below 5% may still be determined with reasonable accuracy and confidence. In the event of projects with less than 10% savings, we will use the FSU methodology listed above to ensure savings claims are statistically meaningful. Site-specific methodologies will be described in project-level M&V plans submitted with Project Applications.

## Monitoring During Reporting Period

Data monitoring will include the collection of data for each dependent and independent variable used in the baseline model. SDG&E usage data will be imported directly into Energy Sensei if possible. Other data will be obtained from customers and reviewed regularly by Cascade staff to identify quality issues or potential non-routine events.

## M&V Roles

All M&V roles, including data management, model development, and performance analysis, will be completed by Cascade and Burch Energy staff. Cascade already has a deep bench of M&V expertise from our longtime leadership in SEM program implementation.

## Incentive Methodology and Compensation

SMART Industrials NMEC financial incentives will be calculated. Incentives will be based on final energy savings as determined during the performance period and verified by the Savings Report. Accordingly, customer incentives will be paid in a single payment following M&V completion. Customer incentives will be calculated as follows, and capped at 100% of full measure cost:

## Timing of Performance Period, Savings Claims, and Incentive Payments

Consistent with the *Rulebook for Programs and Projects Based on Normalized Metered Energy Consumption*, each NMEC project will require 12 months of post-intervention performance monitoring. An initial savings claim will be made after a minimum of 90 days of performance monitoring if statistical criteria can be met and a customer has substantially completed NMEC projects. If an initial savings claim is made, customers are paid up to 50% of the calculated incentive amount, with the final incentive payment made upon completion of the 12-month reporting period. Some incentive payments will have already capped on measure costs at the initial savings claim; in such cases no additional incentive would be paid after the final savings adjustment. Final project savings adjustments (positive or negative) are claimed after the 12-month reporting period.

## Quality Assurance

The following QA and QC steps will be taken to ensure savings estimates are dependable and replicable:

* Customer data would be verified through typical engineering data analysis methods. This includes looking for abnormalities, assessing correlation to energy usage based on understanding of the energy driver, and looking for missing or inaccurate data. Any issues would be discussed with the site staff and resolution would be determined based on the specific issue. Issues and resolutions will be documented in the Data Collection Plan.
* Each hypothesis model will be reviewed for technical accuracy by a qualified in-house engineer. The reviewer and model developer will collaborate until the final model is deemed acceptable.
* The SMART Industrials team will complete an in-house monthly review of data with sites to ensure energy usage is as expected.
* Measure verifications based on site visit documentation.
* Periodic tracking of energy savings progress (visually available with Energy Sensei).
* Quality checks will be used to assess data integrity at multiple stages. These will include checks on data gaps, repeated data, and common logic. Information collection and documentation with reports will be checked to ensure that appropriate project data is being entered, used, and tracked. Cascade will typically ensure QC is done by a team member that was not involved in the project to verify that the team is assessing the information and procedures utilized.

## Software Tools

Models will be developed using an Excel-based workbook template, which streamlines the process of testing candidate variables for statistical significance and comparing and documenting performance of hypothesis models. Once a model is selected, it will be loaded into Cascade Energy’s Energy Sensei software platform, which streamlines the process of data management and performance tracking, while providing other customer-facing services. All hypothesis model variants, input and output data, resulting model coefficients, and model metrics will be documented and available for review, and reviewers will be provided access to Energy Sensei if desired.

## To-Code Savings

All NMEC measures, including to-code projects, will use an existing conditions baseline. Savings estimates will not separately quantify or differentiate incentives for to-code and above-code portions of savings. SMART Industrials will focus on helping customers improve energy performance from a unique starting point. While most SMART Industrials measures will fall outside of clear code applicability, in some cases “To Standard Practice” measures may be identified and included in projects. Sometimes straightforward upgrades go uncaptured indefinitely at some industrial sites due to barriers, such as a customer’s lack of energy efficiency knowledge and the cost of implementing energy-saving projects. If to-code or to-ISP measures are identified and implemented, the project application will assess the operability (or probability of repair) of existing equipment and document program influence.

1. California SEM Design Guide For: Cycle 1, 2, and 3, Version 1.01, Sergio Dias Consulting, LLC (July 5, 2022) available at <https://pda.energydataweb.com/api/view/2647/CA_3_CYCLE_SEM_Design_Guide_V1.01.pdf> [↑](#endnote-ref-2)
2. California SEM M&V Guide, Version 3.02, Sergio Dias Consulting, LLC (July 6, 2022), available at <https://pda.energydataweb.com/api/view/2648/CA_SEM_MV_Guide_v3.02.pdf> [↑](#endnote-ref-3)
3. Application 17-01-013 through 17-01-17 <https://docs.cpuc.ca.gov/PublishedDocs/Efile/G000/M261/K792/261792833.PDF> [↑](#footnote-ref-2)
4. See Table 1 – SMART Implementation Budget Allocation [↑](#footnote-ref-3)
5. See D.16-08-19 Decision Providing Guidance for Initial Energy Efficiency Rolling Portfolio Business Plan Filings at page 41 and page 101

   <http://ccag.ca.gov/wp-content/uploads/2016/10/6.5-Attachment-ALJ-Decision-16-08-019-081816.pdf> [↑](#footnote-ref-4)
6. Custom Project Guidance Documents

   [CPUC Energy Division (file.ac)](https://file.ac/OEr-2p-bk3A/) [↑](#footnote-ref-5)
7. IPMVP Concepts and Options for Determining Energy and Water Savings Volume I

   <https://www.nrel.gov/docs/fy02osti/31505.pdf> [↑](#footnote-ref-6)
8. Uniform Methods Project: SEM M&V Protocol

   <https://www.nrel.gov/docs/fy17osti/68316.pdf>

   BPA MT&R Reference Guide

   <https://semhub.com/resources/mt-r-reference-guide-revision-5-0> [↑](#footnote-ref-7)
9. Disadvantaged Workers defined as: worker that meets at least one of the following criteria:

   lives in a household where total income is below 50 percent of Area Median Income;

   is a recipient of public assistance; lacks a high school diploma or GED;

   has previous involvement with the criminal justice system;

   is a custodial single parent; is chronically unemployed;

   has been aged out or emancipated from the foster care system;

   has limited English proficiency;

   or lives in a high unemployment ZIP code that is in the top 25 percent of only the unemployment indicators of the CalEnviroScreen Tool. [↑](#footnote-ref-8)
10. D.18-05-041, pp.18-19 and 169-170 (Conclusion of Law 3) [↑](#footnote-ref-9)
11. [↑](#footnote-ref-10)