California Industrial SEM Design Guide

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PREPARED BY: SERGIO DIAS CONSULTING LLC

PREPARED FOR: PACIFIC GAS AND ELECTRIC, SAN DIEGO GAS AND ELECTRIC, SOUTHERN CALIFORNIA EDISON, AND SOUTHERN CALIFORNIA GAS COMPANY

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1. OVERVIEW

1.1 Introduction

Although relatively new to the energy efficiency community, rate-payer Strategic Energy Management (SEM) programs have proven to be a successful approach, for both industrial facilities and rate-payer programs, to significantly reducing energy consumption in the industrial sector.[1] Because establishing an SEM approach in a facility requires a broad set of skills and a significant commitment of staff time, external technical assistance is often critical for assisting the process. Energy efficiency programs across the US have demonstrated that they can be a determining factor in the implementation of SEM by providing targeted assistance.[2]

This California Industrial SEM Design Guide (Design Guide) draws on:

1. National efforts by the Consortium on Energy Efficiency to define SEM programs, through the CEE SEM Minimum Elements,
2. The international standard for Energy Management Systems, ISO50001,
3. Material review and discussions with SEM programs in California and across the country. In particular, the Design Guide draws heavily from Southern Cal Edison, Southern Cal Gas, Energy Trust of Oregon and Bonneville Power Administration programs.

Although the details of how programs are designed, implemented, and incented vary, leading Industrial SEM programs are designed to support industrial companies with three high-level objectives:

1. Implementing energy efficiency projects and saving energy.
2. Establishing the Energy Management System (EnMS) or business practices that will help a facility manage and continuously improve energy performance.
3. Normalizing, quantifying, and reporting facility-wide energy performance.

Industrial SEM, as designed for the California Investor Owned Utilities (IOUs), is a long-term (six-year) journey divided into optional two-year engagements. This California Industrial SEM Guide (Design Guide) provides details on expectations for meeting these objectives for the first two-year intensive introduction to SEM.

In this design, SEM is delivered to a participant through a progression of workshops and site-specific activities that take place over that two-year period.

[1,2] Burgess, J et al. 2014, *Industrial Strategic Energy Management Initiative*. Consortium for Energy Efficiency: https://library.cee1.org/content/cee-industrial-strategic-energy-management-initiative/

During the first year, participants begin establishing Energy Management System practices and identify, implement and track organizational and operational changes that will help save energy at their facilities. During the second year, participants solidify and advance those practices. In addition, participants' efforts in the early years are primarily focused on reducing energy waste by increasing operational efficiencies and implementing no- and low-cost solutions through operations and measurement (O&M) actions.

Like other programs, the primary objectives for this Design Guide are to help participants:

1. Implement energy efficiency projects and save energy, with a focus on O&M.
2. Establish a robust, continuous Energy Management System at the facility that impacts company culture in a positive way.
3. Quantify and report facility-wide energy performance.

The Design Guide follows two additional objectives:

4. *Getting peers to talk to one another.* As designed in this guide, the impact of the SEM program is more significant if it is not given in a one-way, lecture-based curriculum. Rather, the focus is on discussion and shared discovery. Participants learn more by hearing from, and talking to, their peers than from listening to a lecture. The Cohort workshop curriculum is designed for SEM Coaches to act as facilitators of conversations and exercises that result in energetic sharing of ideas, challenges and successes. For this reason, it is highly recommended that SEM programs focus on delivery through a cohort model. However, cohort workshops will not work for every customer and delivery of the program to individual companies will follow a similar practice of encouraging staff within the facility to have these conversations.
5. *Achieving a balance between saving energy and building EnMS practices.* In participating in SEM, participants will learn how to save energy, as much as they will learn to build EnMS practices. Generating measurable energy savings is an expectation and a primary goal of this SEM program, and is an important focus early in the curriculum. However, there's an important balance between establishing EnMS practices and achieving persistent energy savings, and participants must strike that balance during their progression through the SEM program. Long-term success with SEM hinges on consistent and early implementation of setting goals, garnering executive support and tracking performance, and on building on those activities over time. These are the practices that lead to persistent energy savings. The SEM program will play a key role in helping participants strike this balance successfully.

The Design Guide provides important details and suggested approaches, as well as considerations for implementing SEM activities and deliverables. It includes intentional design decisions about order, timing and content which includes the order of workshops and activities, when they should occur, the objectives, and the content delivered.

Although the Design Guide is designed for cohorts, not all customers will be able or willing to participate in a cohort delivery approach. The program is equally applicable, and expected to be followed, with individual engagements, with the materials introduced in a similar manner and delivering similar outcomes. The primary difference is that rather than introducing materials in workshops with multiple facilities and companies, it will be introduced to one facility or company.

Central to the SEM workshops is a set of learning objectives which comprise the knowledge and skills that participants will acquire and practice over the course of the two-year engagement. The Program introduces and reinforces the learning objectives through a combination of workshops, face-to-face meetings, and phone/email support. The learning objectives are listed in the workshop overviews.

1.2 Timing

The timing and order of the workshops and activities are important. Their relative timing is illustrated in the chart below.

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17				Milestone #4	
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23		#10 Energy Management System Assessment #2			
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25				Milestone #5	
26		#11 Completion Report #2	#10 Year 2 M&V Report	Payment #3	

1.3 Roles and Responsibilities

There are three main entities involved in the success of the SEM program, the IOU, the implementation contractor, and the participating facility.

1.3.1 Investor Owned Utility

The IOU is ultimately responsible for the success of the SEM program. Specifically, three staff from the IOU provide support and oversight to ensure the program is successful. These three staff include the IOU Program Manager, the IOU Account Executive or Key Account Manager (Account Executive), and the IOU M&V Engineer.

IOU Program Manager

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

1. Coordinates activity between all IOU staff and the implementation contractor.
2. Reviews and has final approval on progress reports and key documents to ensure program progress, influence, and quality is properly documented.
3. Reviews and oversees SEM implementation schedules, and ensures customer issues and implementation contractor issues are resolved.

4. Attends select events to ensure program quality is maintained.

IOU Account Executive

The IOU Account Executive or Key Account Manager (IOU AE) ensures that the right customers are engaged in the program, that customers are receiving the support they need, and that SEM documentation is adequate and consistent with records kept by the IOU AE. Specifically, the IOU AE:

1. Supports the Implementation Contractor in the development of a recruitment strategy and the recruitment of SEM participants.
2. Supports the Implementation Contractor in preparing the Scoping Report, which highlights a potential participant's pre-engagement business practices, existing project plans and potential O&M projects to consider during the SEM engagement.
3. Reviews, provides input, and approves all key program reports.
4. Participates in key events (i.e. kick-off meeting, treasure hunt) to ensure proper transition to the implementation contractor and proper support from the IOU.

IOU M&V Engineer

The IOU M&V Engineer ensures that SEM program M&V activities meet the IOUs requirements and expectations. Specifically, the IOU M&V Engineer:

1. Participates in technical reviews of M&V activities.
2. Reviews, provides input, and approves all M&V reports (i.e. Energy Data Collection Plan, Energy Data Report, Energy Savings Calculation Report), data, and documentation.

1.3.2 Implementation Contractor

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 supporting participants with specific activities, the expectation is that there is one customer-facing individual responsible for supporting a cohort of participants and communicating progress with the IOU. This individual, called the SEM Coach (Coach), will:

1. Maintain regular communication with the IOU PM 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 IOU PM all workshop and activity material and content.
4. Ensure workshops and facility-level activities are properly facilitated and meet program requirements, including meeting 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 program expectations.
7. Ensure technical reviews are completed on-time.
8. Ensure all program data, documentation, and contact information meets program requirements.

The California Industrial SEM program is intended to be implemented by contactors experienced in the delivery of SEM programs in a utility demand-side management environment. As such, the Design Guide makes assumptions about the skills and abilities of individuals delivering SEM. Primarily, the guide assumes that these individuals or teams are:

- Familiar with the SEM Minimum Elements, published by the Consortium for Energy Efficiency (CEE).
- Familiar with ISO50001, and US DOE's Superior Energy Performance.
- Comfortable teaching and discussing basic SEM skills and concepts.
- Skilled at facilitating conversations and activities for large groups.
- Experienced at running group exercises that promote peer interaction, generate ideas and formulate deeper understanding among participants.
- Experienced in conducting Energy Management System Assessments (EMA).
- Knowledgeable of industrial energy-using systems and identifying and prioritizing energy efficiency opportunities, including both O&M and capital projects.
- Capable of creating an energy map and leading Treasure Hunts as defined in the ENERGY STAR Treasure Hunt Guide.
- Experienced in building energy consumption adjustment models to measure whole facility energy performance.
- Proficient with MS Office applications PowerPoint, Word and Excel and Adobe PDF creation and editing tools.
- Preference will be given for contractors whose staff have certification as a Certified Practitioner in Energy Management Systems (CP EnMS) offered by the Institute for Energy Management Professionals. All individuals working directly with customers as an SEM Coach must be certified to CPEnMS within one year of contract execution (which could be extended to two at the IOUs discretion).

1.3.3 Participating Facility

The success of any participating facility (Participant) relies on having a well engaged team. This team typically includes a small team of individuals with roles that are critical to the SEM program, including:

Energy Champion

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

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 Team

The Energy Team is typically a cross-functional team (i.e. management, production, procurement, maintenance, HR) that meets regularly to discuss

Executive Sponsor

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

The Participant must designate a member of staff for each of these roles.

2. SEM DELIVERY: DEVELOPING AN SEM PROGRAM *(MONTHS 1 & 2)*

The sections below describe the expectations for implementing the SEM program.

2.1 Site-Specific Activity #1: Kickoff Meeting

2.1.1 Description

The Kickoff Meeting begins a facility's engagement with the SEM program and introduces the SEM Coach to the facility's team. This meeting has multiple purposes:

1. The Account Executive formally introduces the SEM Coach to key facility personnel including the Executive Sponsor, the Energy Champion, and the Data Owner.

2. The SEM Coach and Account Executive set expectations for the facility's involvement in the SEM program, which improves the likelihood that the Executive Sponsor will provide the necessary support and builds clear expectations around who should attend the workshops.
3. The SEM Coach and Data Owner begin developing the Energy Data Collection Plan.
4. The SEM Coach gets a better sense of the facility layout.
5. The SEM Coach and Account Executive verify elements in the Scoping Report. Paying particular attention to confirming the participant's existing capital project plans, focusing on those that will affect energy consumption. These capital plans must be documented in the Scoping Report and savings must be estimated in the opportunity register to allow the SEM Coach to estimate savings generated by those pre-existing projects and to work with the IOU to define roles and responsibilities in regards to those projects.

The Account Executive is responsible for setting up the meeting, working closely with the Coach to verify the date, time, and location.

It is recommended that after the meeting the Participant give the Coach a facility tour and that the Coach, Energy Champion and Data Owner discuss the Energy Data Collection Plan.

After the meeting, the Coach shall set up a meeting with the IOU Program Manager to review the Final Scoping Report and discuss the participant's existing capital project plans.

2.1.2 Timing

Kick-off Meetings must be held with all participants before the end of Month 1 and at least one week before Workshop #1.

2.1.3 Pre-requisites

At least one week before the meeting takes place, the Coach must:

1. Contact the IOU AE to learn about the facility, discuss any relevant information, existing energy efficiency projects and energy efficiency relationships (i.e. 3rd party implementers). Based on this information, the Coach will create a draft Scoping Report.
2. Deliver Draft Report #1: Scoping Report to the IOU PM

2.1.4 Expected Outcomes

At the Kick-off Meeting, it is expected that:

1. Participant will understand the roles of the SEM Coach, IOU PM, and Account Executive.

2. SEM Coach will build a relationship with the Executive Sponsor, Energy Champion, Data Owner and others at the facility.
3. Executive Sponsor will have a clear understanding of his/her role and expected involvement. This includes attendance at Workshop 1, Workshop 8, the Treasure Hunt, and the Energy Management System Assessment (EnMS Assessment).
4. Participant will have clarity on who will attend Workshop 1 (Executive Sponsor, Energy Champion, Data Owner, others), and other workshops.
5. SEM Coach will build an understanding of the participant's experiences and history with energy efficiency and energy management. Although the EMA is not performed until before Workshop 5, the kick-off meeting should serve as an opportunity for gathering information on the site's current SEM practices. The Coach may use some of the EnMS Assessment questions to gauge this.
6. Data Owner and SEM Coach will agree on a general sense of relevant energy drivers, and have a plan for gathering and providing quality data. The Coach should provide and discuss with the participant the Energy Data Collection Plan, outlining the expectations for data transfer (minimum data requirements, general format guidelines, process for transferring data). This topic will also be covered in detail in Workshop 1.
7. Participant, SEM Coach, and IOU Account Executive will have a clear understanding of the existing planned capital projects and will have a plan for estimating savings from those projects.
8. SEM Coach, IOU Account Executive, and IOU Program Manager have a clear understanding of the roles and responsibilities regarding existing planned capital projects.

2.1.5 Deliverables

The Coach must:

1. Update the Scoping Report with any additional information gathered at the Kick-off Meeting within one week of the meeting.
2. Update and deliver SEM Participant Tracking Report to the IOU PM within one week of the meeting.
3. Schedule a meeting with the IOU PM and IOU AE to discuss existing capital project roles and responsibilities.

2.1.6 Tools

1. Scoping Report Template
2. SEM Participant Tracking Template

2.2 M&V Activity #1: Energy Data Collection Plan and Baseline Data Collection

2.2.1 Description

The energy consumption adjustment model (energy consumption model) is an important tool in the SEM program. The participant should understand that it can take a long time to build a good working model, and a substantial amount of effort, on the part of both the Coach and the participant, to adopt and maintain the model.

The energy consumption model serves two primary purposes:

1. It provides feedback to SEM participants during and after their program, including data visualizations that provide vital information on overall energy performance. The energy consumption model must help participants understand if their efforts to save energy are paying off, and if not, provide an indicator that motivates corrective action.
2. It calculates energy savings. In conjunction with the opportunity register, the energy consumption model is used to verify, quantify and validate energy savings achieved through SEM.

The SEM Coach must review the California Industrial SEM M&V Guide (the M&V Guide) prior to starting an SEM engagement. This Guideline details recommended methods and best practices for establishing the energy consumption model for an entire facility in the context of an SEM program.

As outlined in the M&V Guide, the Coach shall work with the participant to develop an Energy Data Collection Plan that includes:

General Information

1. The facility boundaries
2. The baseline period

Energy Consumption Data

3. Energy flows
4. Types of energy for which data is to be collected
5. Sources of data (meters)
6. Units for energy data
7. Frequency for data collection
8. Method and location for which energy consumption data will be documented

Relevant Variable Data

9. Relevant variables for which data is to be collected

10. Sources of relevant variable data
11. Units for relevant variable data
12. Frequency for relevant variable data collection
13. Method and location for relevant variable data collection

In addition, the Coach must address confidentiality of the data in the Energy Data Collection Plan to ensure, for both the customer and the program, that the data will not be compromised.

Historic energy data for the baseline period shall be obtained from the participant or the utility. Relevant variable data will likely come from both the Coach (i.e. weather and humidity data), and the participant (i.e. production). A process shall be developed for the SEM Coach to receive energy and relevant variable data at regular, agreed-upon intervals.

The Coach must review data received from the customer to confirm the quality of the data for factors such as:

1. The time period of the data is correct and can be correlated
2. The data is in a format that the Coach can read and use
3. The data is for the relevant variables discussed with the Coach
4. The sources of data are as outlined in the energy accounting plan
5. Data is reviewed for outliers and if outliers need to be removed, that a record is maintained in the Energy Accounting Data Report

Timely review of the data by the Coach will allow the participant to correct any errors and meet the milestone incentive deadline.

The Energy Data Collection Plan and a summary of the Baseline Data shall be documented in the M&V Report.

2.2.2 Timing

M&V Activity #1: Energy Data Collection Plan and Baseline Data Collection, shall be completed by the end of Month 2.

2.2.3 Pre-requisites

1. Completion of SEM Activity #1: Kick-off Meeting
2. Completion and approval of Scoping Report

2.2.4 Expected Outcomes

1. Energy Data Collection Plan documented in the M&V Report

2. 12 months of historical data for energy and preliminary relevant variables, reviewed and approved by the Coach and documented in the M&V Report

2.2.5 Deliverables

1. Initial draft of the M&V Report, with Energy Data Collection Plan and Energy Data Report sections completed and delivered to the IOU PM before Workshop #2
2. Email notification sent to IOU PM within one week of receipt and approval of historical data
3. Updated Report #7: SEM Participant Tracking Report delivered to the IOU PM before Workshop #2

2.2.6 Tools and Reference Documents

1. California Industrial SEM M&V Guide
2. M&V Report Template

2.3 Milestone Incentive #1: Energy and Relevant Variable Data

Milestone incentives are paid to each participant based on progress made in the program; there are no exceptions to the milestone due date. If the milestone is not met by the due date and all the requirements are not met, the payment for that milestone is not made.

The table below identifies the milestone that must be met in order to receive the incentive. The SEM Coach must work with the IOU PM to establish specific due dates for each milestone at the start of SEM and to track the completion status of each milestone. The Coach is also expected to remind participants of milestone deadlines during Workshops and on-site meetings.

Milestone #	Milestone Requirement	Due Date	Incentive Amount
1	1. Provide program with one year of approved historical energy data and relevant variable data. 2. Attend workshop #1	End of Month Two	TBD by each utility

As discussed in: M&V Activity #1: Energy Data Collection Plan and Data Collection; the historical energy and relevant variable data must be reviewed and screened by the Coach. The data must be reviewed to ensure that:

1. The time period of the data is correct and can be correlated
2. The data is in a format that the Coach can read and use
3. The data is for the relevant variables discussed with the Coach
4. The sources of data are as outlined in the Energy Data Collection Plan section of the M&V Report
5. Data is reviewed for outliers and if outliers need to be removed, a record is maintained in the Energy Data Report section of the M&V Report

Data provided that does not meet these standards will not be eligible for the milestone incentive.

In addition, the Coach must ensure that confidentiality of the data is ensured at this and all milestones.

2.4 Incentive Payment #1: Milestone Incentive Pre-Payment

Subject to change by the IOU, Payment #1 will be for 30% of all milestone incentive funds at the receipt and verification of data for Milestone #1 and 70%, if all conditions are met, at the end of the SEM commitment period (Month 26). Payment at month 26 will be made only for milestones that are met.

2.5 Workshop #1: Establishing an SEM Program

2.5.1 Description

All workshops can be delivered in either a Cohort model (preferred) or in cases where a customer is not participating in a Cohort, the materials can be delivered individually to a single facility's energy team.

Workshop 1 introduces the concept of SEM and offers practical guidance for participants taking steps toward establishing an SEM program in their organization. For most participants, SEM, and continuous improvement in general, will be new. This workshop is an opportunity to generate buy-in, explain the high-level method of implementation, and begin laying the foundational pieces of an SEM program. At this workshop, participants will begin to build their energy team as well as establish their goals for SEM.

The agenda shall include an overview of key aspects of the 2-year curriculum and set the stage for identifying energy drivers and delivering quality data. Timely delivery of energy driver data is critical to keeping SEM on schedule and at this workshop the Coach will review the minimum requirements for data as well as guidelines for acceptable data formats and data transfer.

At each workshop, the Coach will distribute a workshop evaluation form to all participants and record the results, as well as a summary of the workshop (attendees, topics discussed, issues) in the Workshop Summary Report. Recommended duration of this workshop is 8 hours.

2.5.2 Timing

Workshop #1 must be completed by the end of Month 2.

2.5.3 Pre-requisites

At least one week before the workshop takes place, the Coach must:

1. Complete SEM Activity #1: Kick-Off Meeting, with each participant.
2. Develop and review with the IOU PM:
    a. Workshop "Run of Show": details on the sequence and timing of events for the workshop.
    b. Workshop presentation slides.
    c. A workshop workbook: a printed workbook that will be handed out to all participants.

2.5.4 Expected Outcomes

Workshop #1 learning objectives include:

1. Learning what SEM is and how it differs from other approaches
2. Learning about the SEM program and its requirements
3. Learning how to establish, maintain and leverage executive commitment
4. Learning how to establish an energy commitment (e.g. policy and goals)
5. Learning how to identify and establish SEM roles and responsibilities
6. Learning how to develop and manage an energy team
7. Learning how to implement an effective energy planning process
8. Learning how to identify energy drivers
9. Learning how to collect energy-use data
10. Learning how to ensure data quality

Expected Attendees include at least:

1. The Executive Sponsor
2. The Energy Champion

3. Energy Team Members

Expected commitments from the participant include at least:

1. Date confirmation for Workshop #2
2. Data Delivery Timeline
3. Treasure Hunt Sign-Up

2.5.5 Deliverables

Within one week of each Workshop, the Coach is expected to deliver to the IOU PM and the IOU AE:

1. SEM Workshop Summary Report
2. Workshop Feedback Report
3. Update SEM Participant Tracking Report and deliver to the IOU PM

Templates for these reports should be developed and approved by the IOU PM at least one week before the first workshop.

2.5.6 Tools and Reference Documents

1. Workshop #1: Run of Show, Presentation, Workbook
2. SEM Workshop Summary Report Template
3. Workshop Feedback Report Template

3. ENERGY PLANNING AND MEASURING SAVINGS (MONTHS 2 TO 6)

3.1 M&V Activity #2: Develop and Review Hypothesis Model

3.1.1 Description

A Hypothesis Energy Consumption Adjustment Model (Hypothesis Model) is a model that takes historical energy data in combination with historical data for relevant variables (production, heating degree-days, humidity, etc.) to establish a basic relationship between energy consumption and those variables. The hypothesis model is a preliminary regression model that is based on an informed understanding of the physical characteristics of the manufacturing processes. Key factors to consider include the baseline duration, measurement interval, treatment of outliers, and correlation of energy drivers.

To create any energy consumption models, the Coach will use a tool that meets the requirements of the California Industrial SEM M&V Guide will review the choice of tool with the IOU PM and the IOU M&V Engineer.

The Coach will use the California Industrial SEM M&V Guide to develop the Hypothesis Model and when a working model is ready, will contact the IOU PM to arrange a technical review of the model. This review will provide an opportunity to discuss the modeling approach and Energy Data Collection Plan, discuss relevant variables, describe model statistics, understand any specific challenges or issues, and agree upon next steps. At this point, the hypothesis model is not subject to the validation criteria outlined in Section 7.3 of the M&V Guide as data for the full performance period is not yet available.

This review is critical as it allows the IOU PM, IOU M&V Engineer, and Coach to discuss and document any data or modeling issues that are present and to proactively discuss options for either resolving or working around those issues. The IOU has the option to review the outcomes of the technical review with the CPUC, primarily if there are significant potential savings from the customer or if there are anomalies in the modeling that should be proactively discussed.

3.1.2 Timing

M&V Activity #2: Develop and Review Hypothesis Model, shall be completed by the end of Month 5 and before Workshop #3: Tracking Performance 101.

3.1.3 Expected Outcomes

1. Review tool used to create energy consumption models with IOU PM and IOU M&V Engineer
2. Development of Hypothesis Model for each facility
3. Review of Hypothesis Model with IOU PM and IOU M&V Engineer

3.1.4 Pre-requisites

1. Completion of M&V Activity #1: Energy Data Collection Plan and Baseline Data Collection

3.1.5 Deliverables

1. Coach will deliver initial draft of Hypothesis Model to IOU PM one week before Technical Review
2. Coach will deliver second draft of M&V Report, including Energy Data Collection Plan, Baseline Data Review and Hypothesis Model Documentation, to IOU PM, at least one week before Technical Review

3. Coach will update SEM Participant Tracking Report and deliver to the IOU PM before Workshop #3
4. Coach will schedule a Technical Review with IOU PM at least one week before Workshop #3

3.1.6 Tools and Reference Documents

1. California Industrial SEM M&V Guide

3.2 Workshop #2: Saving Energy 101

3.2.1 Description

Workshop #2 helps participants understand how their facility uses energy, and what they can do about saving energy. The workshop focuses on giving participants the knowledge and skills needed to hold a successful Treasure Hunt, and implement energy-saving projects as early as possible. The energy map, ideas for no- and low-cost energy saving actions, and the Opportunity Register are delivered and explained during this workshop. Sub-system energy efficiency training will be provided, and data-logging toolkits shall be distributed and explained to each participant team. All these topics prepare the participant for the Treasure Hunt, which occurs soon after Workshop #2.

Identifying and implementing quick wins is critical to building momentum and enthusiasm for SEM. This workshop is geared toward the doers, the people who want to dig in and make things happen. The agenda should include training that will enable near-term development of technical opportunities through straight-forward concepts, processes and tools.

The Data Logging Toolkit must be provided by the implementation team to each participant. The Implementation contractor must develop a Data Logging Toolkit list, which shall be reviewed and approved by the IOU PM. Below is an example of the materials the Toolkit may include:

1. (2) Onset Hobo four-channel data loggers (or comparable) – This data logger will log four external channels (such as a current transducer or temperature probe) and includes an integrated display to read logger status and current measurement values.
2. 100, 200 and 600 amp Current Transducer (CT) – These CTs must be compatible with the data loggers.
3. Digital light meter – A digital light meter to measure light levels in foot-candles.
4. Kill A Watt (or comparable)– This meter displays actual volts, amps, and wattage for any plug load.

5. Flashlight/laser pointer – Used to identify and view equipment features during a walk-through.
6. Infrared Digital Thermometer- Used to measure surface temperature of boiler/furnace or other hot surfaces. Also used to identify the need for sealing or insulation in pipes or walls.
7. Thermocouple with Digital Readout- Used to measure exhaust gas temperature.
8. Ultrasonic Leak Detector- Used to identify compressed air system and steam trap leaks.
9. Tool bag – A small tool bag to store all tools

Recommended duration of this workshop is 8 hours.

3.2.2 Timing

Workshop #2: Saving Energy 101 must be completed by the end of Month 3.

3.2.3 Pre-requisites

The Coach's responsibility, at least two weeks prior to the workshop include:

1. Delivery of Workshop #1- Establishing an SEM Program
2. Develop, reviewing with the IOU PM:
    a. Workshop "Run of Show": details on the sequence and timing of events for the workshop.
    b. Workshop presentation slides and materials: all slides and materials that will be presented or given to participants. Note that the IOU should be consulted to provide information and potentially presentation materials on how to read the utility bills. The IOU Account Executive should be invited to present that section of the presentation.
    c. A workshop workbook: a printed workbook that will be handed out to all participants.
    d. A Data Logging Toolkit list.
3. Develop, reviewing with the IOU PM and IOU AE:
    a. Energy Sub-System Training presentation. Note that the IOU may provide information on energy sub-system opportunities. This presentation should include both electric and natural gas sub-systems and should be modified to meet the needs of the participating facilities.
4. Distribute to participants (via email or other means) the Energy Map and Opportunity Register tools, asking them to load them on a laptop and to bring the laptop to the workshop.
5. Ask Participants to bring energy bills (for all sources of energy) to the workshop.

3.2.4 Expected Outcomes

Workshop #2 learning objectives include:

- Learning the basic principles of electricity and gas and how to read a utility bill.
- Practicing simple calculations around electricity and gas use and savings (kWh, therms and dollars).
- Learning to track and prioritize savings opportunities using the Opportunity Register.
- Learning high-level technical aspects of key energy-using subsystems, focusing on O&M.
- Receiving the data logging toolkit and learning how to use it.
- Learning the purpose of the energy map, how to use the tool, and how to create a map.
- Learning about the Treasure Hunt and how to plan for it.
- Learning how to conduct a Treasure Hunt and the resources available to support it.
- Discussing how to identify energy-saving opportunities, focusing on low or no-cost opportunities.

Expected Attendees include at least:

1. The Energy Champion
2. Selected Energy Team Members
3. IOU Account Executive
4. Attendance by the IOU PM is strongly encouraged

Expected commitments from the participant include at least:

1. Date confirmation for Workshop #3
2. Final Treasure Hunt Sign-up

3.2.5 Deliverables

Within one week after each Workshop, the Coach is expected to deliver to the IOU PM and the IOU AE:

1. SEM Workshop Summary Report.
2. Workshop Feedback Report.
3. Update SEM Tracking Report and deliver to the IOU PM

3.2.6 Tools and Reference Documents

1. Data Logging Toolkit List
2. Energy Map Tool
3. Opportunity Register Tool
4. Energy Sub-System Training Presentation
5. EPA Treasure Hunt Guide or similar

3.3 Site-Specific Activity #2: Energy Map

3.3.1 Description

The energy map is akin to an energy end-use breakdown chart. It highlights potential areas for eliminating waste and helps site personnel visualize the relative scale of energy use for different locations and systems in their facility. The map is also used to prepare for the Treasure Hunt, since areas of highest consumption are often good focal points for the hunt.

The energy map produces a compelling and understandable graphic and chart of how the facility uses energy. The Coach should urge participants to post their energy maps in a high visibility location at their facility.

The Energy Map Tool shall be a tool, likely excel-based, that helps participants build a basic energy map, and optionally a detailed energy map. The tool shall be designed to help participants organize and understand energy use at their facility by area or system.

Participants are expected to develop an energy map on their own, using the tool to build the map to their preferred level of detail. The appropriate facility subject matter experts should fill out the energy map for each phase, according to their area of expertise. Coaches provide information about the energy map during Workshop 2 and are available to assist participants as they complete their maps after the workshop.

3.3.2 Timing

The Energy Map must be completed before the Treasure Hunt and by Month 5.

3.3.3 Expected Outcomes

The energy map is intended to:

- Identify and show where and how much energy is used within a facility.
- Create employee awareness of facility-wide energy use.

- Prioritize energy-saving opportunities based on areas of high use in a facility.

3.3.4 Pre-requisites

1. Attendance by Participant in Workshop #2- Saving Energy 101
2. Completion by Coach and Participant of the Energy Data Collection Plan

3.3.5 Deliverables

Within one week after completion, the participant will share the completed Energy Map with the SEM Coach. Within one week after receiving the Energy Map, the SEM Coach will:

1. Update SEM Tracking Report and deliver to the IOU PM

3.3.6 Tools and Reference Documents

1. Energy Map Tool

3.4 Site-Specific Activity #3: Treasure Hunt

3.4.1 Description

The Treasure Hunt can have the highest impact on the success of a participant's engagement in SEM. It should ignite enthusiasm among employees and set the stage for success in improving the facility's energy performance.

The primary goal of the Treasure Hunt is to identify energy waste and energy saving opportunities so that participants can make changes that save energy. A successful outcome of the Treasure Hunt is an opportunity register filled with a variety of prioritized energy saving projects. Although the employee engagement workshop has not yet happened, it is never too early to start encouraging employees and generating enthusiasm for saving energy. The Treasure Hunt is also a great time to get others involved and has been used as a valuable employee engagement event by other programs.

The SEM Coach must plan and facilitate this event, in coordination with the Energy Champion and the IOU AE. The SEM Coach must work with the Energy Champion in advance to determine the scope of the Treasure Hunt. Generally, the entire facility is the focus rather than individual systems. This can be adapted and narrowed as needed in specific situations. Although rare, some facilities are so large that the Treasure Hunt must be focused on a system or specific engagement boundary, rather than being all-encompassing. The SEM Coach should ask the host if they are interested in inviting one or two of their SEM peers to attend and contribute to the Treasure Hunt. This often results in valuable sharing of best practices and deepens relationships between peers.

If the host is interested, the Coach should coordinate attendance of other Energy Champions at the Treasure Hunt.

The AE is expected to attend and help support the Treasure Hunt. The SEM Coach shall coordinate with the AE to ensure the AE can attend and to discuss if additional IOU resources are needed or expected to support a successful Treasure Hunt. After the Treasure Hunt concludes, the Coach will teach the facility's energy team how to estimate energy savings for projects identified during the Treasure Hunt.

The *Energy Star Treasure Hunt Guide* or a similar guide shall provide additional detail for conducting a Treasure Hunt.

All projects, including O&M, retro-commissioning, and Capital projects identified in the Treasure Hunt must be documented in the Opportunity Register. The Coach must ensure that capital projects identified be documented in accordance with any additional IOU requirements, which may require documentation outside of the opportunity register.

3.4.2 Timing

The Treasure Hunt must be completed before Workshop #3 and by Month 5.

3.4.3 Expected Outcomes

The Treasure Hunt is intended to teach participants to:

- Learn to identify energy waste
- Feel empowered to take actions that save energy immediately
- Identify low- and no-cost energy-saving projects that will become the focus of their SEM engagement
- Increase awareness of how energy is used and wasted in their facility
- Receive practical hands-on experience with the data-logging toolkit
- Gain experience that may help the facility perform its own Treasure Hunts in the future
- Learn how to document and track energy savings measures using the opportunity register
- Learn to prioritize energy saving measures

3.4.4 Pre-requisites

1. Attendance by the Participant in Workshop #2
2. Completion by the Participant of the Energy Map
3. Receipt of the Energy Logging Toolkit by the Participant

3.4.5 Deliverables

Within two weeks after conducting the Treasure Hunt, the SEM Coach will:

1. Meet with the energy team to estimate energy savings from the projects listed in the opportunity register, complete the opportunity register, and receive a copy of the opportunity register.
2. Complete the Treasure Hunt Report
3. Update SEM Participant Tracking Report and deliver to the IOU PM

3.4.6 Tools and Reference Documents

1. Data Logging Toolkit List
2. Energy Map Tool
3. Opportunity Register Template
4. Treasure Hunt Report Template

3.5 Workshop #3: Tracking Energy Performance 101

3.5.1 Description

Workshop #3 gives participants tools and methods for understanding and tracking energy performance. Participants will have just completed their energy map and Treasure Hunt and should have some idea of their opportunities. This will be the first time the participants see their energy model. Energy intensity models are formally handed off at this workshop, and participants are given an opportunity to practice updating and reviewing the results.

An important objective of this workshop is for participants to spend time reviewing their model, practicing updating the results and learning how to interpret the results. A best practice is to have multiple Coaches on hand during this workshop to help all teams practice with their model and be available to answer questions. Participants should be able to begin tracking energy performance using their model after this workshop.

At this workshop, the Coach shall help each participant understand their own model, this can be done by:

- Sharing the California SEM M&V Guide as a reference document
- Showing a historical energy-use graph and discuss the justification for choosing the baseline period boundaries
- Discussing trends in data

- Noting outliers, and discuss the cause of any outlying data in raw data and residuals
- Showing scatter diagrams of key relevant variables versus energy

Recommended duration of this workshop is 4 hours.

3.5.2 Timing

Workshop #3 shall be completed by the end of Month 6.

3.5.3 Expected Outcomes

Workshop #3 Participant learning objectives include:

- Learning about the rigor that goes into developing Energy Consumption regression models.
- Learning about the modeling process and how to visualize data.
- Practicing using and updating their energy consumption model.
- Learning when to question the results of a model.
- Learning how to analyze the results of a model and the CUSUM to track energy performance.

Expected Attendees include at least:

1. The Energy Champion.
2. Data Master
3. Energy Team Members.

Expected commitments from the participant include at least:

1. Date confirmation for Workshop #4
2. Energy Management System Assessment (EnMS Assessment) Sign-up

3.5.4 Pre-requisites

The Coaches responsibility include:

1. Working Energy Consumption Model developed by the Coach, reviewed by IOU PM, and distributed to the Participant
2. Develop and review with the IOU PM, at least two weeks prior to the workshop:
    a. Workshop “Run of Show”: details on the sequence and timing of events for the workshop.
    b. Workshop presentation slides.

c. A workshop workbook: a printed workbook that will be handed out to all participants.

3. Ask Participants to bring a laptop with the Energy Consumption Model and their Opportunity Register

3.5.5 Deliverables

Within one week after each Workshop, the Coach is expected to deliver to the IOU PM and the IOU AE:

1. SEM Workshop Summary Report.
2. Workshop Feedback Report.
3. Update SEM Participant Tracking Report and deliver to the IOU PM

3.5.6 Tools and Reference Documents

1. Energy Consumption Model Tool

3.6 M&V Activity #3: Collect and Review Mid-Year Energy Data and Opportunity Register

As discussed in: M&V Activity #1: Energy Data Collection Plan and Baseline Data Collection; all energy and relevant variable data must be screened by the Coach and meet the program's quality standards. Data provided that does not meet data standards will not be eligible for the milestone incentive.

In addition, the Coach must review the Opportunity Register to ensure that it:

1. Reflects the outcome of the Treasure Hunt and any other potential projects
2. Incudes a prioritization of potential projects
3. Includes estimated energy savings for high-priority projects

3.7 Milestone Incentive #2: Updated Energy Data and Opportunity Register

As mentioned earlier, milestone incentives are paid to each participant based on progress made in the program. Milestone incentives are paid as part of the incentive payment at the end of each year; there are no mid-term payments and no exceptions to the milestone due date. If the milestone is not met by the due date, the payment is not made.

The table below identifies the milestone that must be met in order to receive the incentive. The SEM Coach must work with the IOU PM to establish specific due dates for each milestone at the start of SEM and to track the completion status of each milestone. The Coach is also expected to remind participants of milestone deadlines during Workshops and on-site meetings.

Milestone #	Milestone Requirement	Due Date	Incentive Amount
2	1. Provide program with at least six months of approved post-baseline energy data and relevant variable data. 2. Provide updated opportunity register to SEM Coach 3. Attend workshops #2 and #3	Month 8	TBD by each utility

As discussed in: M&V Activity #1: Energy Data Collection Plan and Baseline Data Collection; all energy and relevant variable data must be screened by the Coach and meet the program's quality standards. Data provided that does not meet data standards will not be eligible for the milestone incentive.

In addition, the Coach will ensure that confidentiality of the data is ensured at this and all milestones.

3.7.1 M&V Activity #4: Model Trial and Participant Review of Model Description

Once the Hypothesis model has been reviewed with the Participant and six months of data have been collected, the Coach will reexamine the initial Hypothesis Model to ensure all relevant variables have been identified, using the most recent data to validate the model.

At this point, an in-person meeting to review the current model shall be scheduled. At this meeting, the participant should understand the energy consumption model well enough to trust that regression modeling is a viable method of calculating energy savings for their facility.

During this discussion, the Coach shall cover the following points:

- Share the California SEM M&V Guide as a reference document
- Show a historical energy-use graph and discuss the justification for choosing the baseline period boundaries
- Discuss trends in data
- Note outliers, and discuss the cause of any outlying data in raw data and residuals

- Show scatter diagrams of key relevant variables versus energy
- Show a scatter diagram of actual energy versus calculated (or predicted) energy
- Show a time-series graph of actual energy, predicted energy and residuals during the baseline period
- Describe the idea of a cumulative savings line (CUSUM), and show a CUSUM graph
- Show participants how to add production and relevant variable data to update savings calculations, if applicable

The participant and Coach will continue to collect data and refine the models and reexamine the hypothesis model to ensure that all energy drivers have been identified. As needed, the participant and Coach should update the model.

As discussed in M&V Activity #1, it is critical that the Coach review data received from the customer and confirm the quality of the data for factors such as:

1. The time period of the data is correct and can be correlated
2. The data is in a format that the Coach can read and use
3. The data is for the relevant variables discussed with the Coach
4. The sources of data are as outlined in the energy accounting plan
5. Data is reviewed for outliers and if outliers need to be removed, that a record is maintained in the Energy Accounting Data Report

Feedback must be given to the customer promptly to correct any data issues found.

3.7.2 Timing

M&V Activity #4: Model Trial and Participant Review of Hypothesis Model must be completed by the end of Month 9.

3.7.3 Expected Outcomes

1. Review of updated Hypothesis Model with participant
2. Participant understanding and use of model

3.7.4 Pre-requisites

1. Completion of M&V Activity #2: Develop and Review Hypothesis Model
2. Collection of at least six months of post-baseline data
3. Participant attendance in Workshop #3: Tracking Performance 101

3.7.5 Deliverables

1. Initial draft of Energy Consumption Model to participant during Workshop #3
2. Delivery of at least six months of post-baseline energy and relevant variable data by participant to Coach by the end of Month 8
3. Draft of Energy Model Report, including energy accounting plan and hypothesis model documentation, to participant
4. Update SEM Tracking Report and deliver to the IOU PM before Workshop #3

3.7.6 Tools

1. California Industrial SEM M&V Guide

4. IMPLEMENTATION *(MONTHS 7 TO 13)*

4.1 Workshop #4: Employee Engagement 101

4.1.1 Description

Workshop #4 provides strategies and tactics for accomplishing energy engagement among all employees. Participants discuss and share approaches to building support for SEM goals, and are given an opportunity to begin planning their next steps in this important aspect of SEM.

Workshop #4 establishes that SEM is most successful when all employees are fully engaged. The workshop provides strategies for sparking interest and getting buy-in. It also provides a forum for participants to recognize challenges and devise creative solutions for getting employees involved in SEM.

Participants will begin planning employee engagement activities at this workshop. The SEM Coach should be available to advise on their activities, but shall not play a key role in their delivery.

Recommended length of this workshop is 4 hours.

4.1.2 Timing

Workshop #4 shall be completed by the end of Month 8.

4.1.3 Expected Outcomes

Workshop #4 learning objectives include:

- Learning why employee engagement is an important part of SEM success.
- Discovering how employees impact energy use.
- Brainstorming how to overcome staff resistance to change and other barriers to engagement.
- Developing initial strategies for enrolling their workforce in saving energy.

Expected Attendees include at least:

1. The Energy Champion.
2. Selected Energy Team Members.
3. Often a human resources representative or other person involved in internal communications at participant facilities, so they can impart important program information to the rest of the staff.

Expected commitments from the participant include at least:

1. Date confirmation for Workshop #5.
2. Final sign-up for an EnMS Assessment.

4.1.4 Pre-requisites

1. Workshop #3- Tracking Energy Performance 101
2. Develop and review with the IOU PM:
    a. Workshop “Run of Show”: details on the sequence and timing of events for the workshop
    b. Workshop presentation slides
    c. A workshop workbook: a printed workbook that will be handed out to all participants

4.1.5 Deliverables

Within one week after each Workshop, the Coach is expected to deliver to the IOU PM and the IOU AE:

1. SEM Workshop Summary Report
2. Update SEM Participant Tracking Report

4.1.6 Tools and Reference Documents

None

4.2 Site-Specific Activity #4: Employee Engagement Support

4.2.1 Description

Following Workshop #4- Employee Engagement, the Participant will have developed some initial strategies for engaging employees. The Program, through the Coach, shall provide advice and support but will not play a key role in the delivery of any employee engagement activities.

Support by the Coach should include employee engagement resources such as:

- Posters
- Presentations
- Toolbox Talk Cards

As well as advice on how to implement the strategies the Participant identified in Workshop #4.

4.2.2 Timing

Employee Engagement Support shall start immediately following Workshop #4.

4.2.3 Expected Outcomes

Employee Engagement Support shall help participants refine and implement the strategies developed in Workshop #4.

4.2.4 Pre-requisites

1. Workshop #4- Employee Engagement
2. Employee Engagement Resources

4.2.5 Deliverables

None

4.2.6 Tools

None

4.3 Site-Specific Activity #5: Year 1 Energy Management System Assessment

4.3.1 Description

The Energy Management System Assessment (EnMS Assessment) is a facilitated review of SEM practices. The results of the EMA help each participating site assess their progress and plan for continued improvement of both their energy performance and Energy Management System.

The EnMS exercise must be based on a tool that includes questions focused on all aspects of SEM, as defined by this Guide. The Coach must select an EnMS Assessment tool that allows for a facilitated conversation designed to identify and characterize EnMS practices at an industrial facility.

The EnMS Assessment Tool must cover, at a minimum, elements that analyze the organization's:

1. Organizational and management commitment to energy management: this section should include questions on policy and goals, allocation of resources and funds, and communication.
2. Ability to plan and implement energy improvements: this section should include questions on project management, employee engagement, and reassessment of both EnMS practices and energy improvement projects.
3. Ability to measure and report energy consumption: this section should include questions on data collection and availability, energy information analysis, and energy performance reporting.

Each facility will have an EnMS Assessment performed between Workshops 4 and 5. Workshop 4 will introduce the EnMS Assessment and Workshop 5 will explain and interpret results. The EnMS Assessment occurs at each participant's site, and is facilitated by the SEM Coach. The session should take between 3 and 5 hours to administer, including time to introduce the EnMS Assessment and review results. A summary must be provided immediately.

4.3.2 Timing

The Energy Management System Assessment shall be completed before Workshop #5 and by Month 11.

4.3.3 Expected Outcomes

The EnMS Assessment is intended to teach participants to:

- Recognize what they have accomplished with respect to their Energy Management System practices
- Recognize where they have room for improvement
- Use the EnMS Assessment results to inform a plan to improve their EnMS practices
- Learn to use the EnMS Assessment tool

Expected Attendees:

1. The Energy Champion
2. The Executive Sponsor
3. Energy Team Members
4. Selected Facility Leadership Staff
5. Attendance by the IOU Account Executive is strongly encouraged

4.3.4 Pre-requisites

1. Attendance by the Participant in Workshop #4- Employee Engagement

4.3.5 Deliverables

After conducting the EnMS Assessment, the SEM Coach will:

1. Within one week, update SEM Tracking Report and deliver to the IOU PM

4.3.6 Tools

1. Energy Management System Assessment Tool

4.4 Workshop #5: Persistence 101

4.4.1 Description

Workshop #5 gives participants a chance to reflect on their SEM program experience thus far, as each participant has engaged in the program for nearly a year at this point. With an eye on the future, they will consider what has worked, what has not and where they want to go from here, both with their Energy Management System practices and their energy saving projects. Participants will discuss persistence strategies to prevent backsliding and maintain savings from completed energy projects. The workshop also helps participants consider how to continue to develop and improve their Energy Management System practices. The Energy Management System Assessment plays a vital role in the preparation for this workshop.

Participants will learn from each other's experiences through a series of discussions geared toward continuing their SEM engagement into Year 2. They will also start to think about building persistence into their energy projects. Participants will bring their latest Opportunity Registers, Energy Consumption Models, and EnMS Assessment results to the workshop.

Recommended duration of this workshop is 4 hours.

4.4.2 Timing

Workshop #5 shall be completed by the end of Month 11.

4.4.3 Expected Outcomes

Workshop #5 learning objectives include:

- Sharing ideas for driving EnMS practices deeper into their company culture.
- Reviewing energy project status and generating new ideas for saving energy.
- Building strategies to ensure energy savings persist over the long term.
- Reviewing EnMS Assessment results and discussing how to develop practices to support their persistence strategies.

Expected Attendees include at least:

1. The Energy Champion.
2. Energy Team Members.

Expected commitments from the participant include at least:

1. Date confirmation for Workshop #6.
2. Sign-up for a second Treasure Hunt.

4.4.4 Pre-requisites

1. Participant attendance in Workshop #4- Employee Engagement
2. At least two weeks before the workshop the Coach must develop, reviewing with the IOU PM:
    a. Workshop "Run of Show": details on the sequence and timing of events for the workshop.
    b. Workshop presentation slides.
    c. A workshop workbook: a printed workbook that will be handed out to all participants.

4.4.5 Deliverables

Within one week after each Workshop, the Coach is expected to deliver to the IOU PM and the IOU AE:

1. SEM Workshop Summary Report
2. Update SEM Participant Tracking Report

4.4.6 Tools and Reference Documents

None

4.5 M&V Activity #5: Model Application and Finalization

4.5.1 Description

Data for both energy consumption and relevant variables must continue to be collected per the Energy Data Collection Plan. At the 12-month mark, with existing data to date, the model shall be finalized and, if multiple models were developed, a final model shall be selected and used for savings validation. If multiple models were developed, the Coach and participant must work together to select the best model to use moving forward.

As data is collected, the Coach must perform model fitness tests at regular intervals by answering questions such as:

1. Is the reporting-period range for each energy driver within the baseline-period range?
2. Have operating characteristics remained similar? i.e. have there been any shutdowns or major changes such as opening or closing production lines, outsourcing or bringing back certain operations?
3. Has production accounting stayed the same?
4. Has any new equipment been installed or equipment removed from service?
5. Does the level of energy savings achieved so far meet a rough bottom-up check?

Based on responses to the questions, the Coach must refine the model as necessary per guidance given in the SEM M&V Guide. As the SEM Year-1 engagement nears completion, the Coach and participant will select the final model for savings validation.

As discussed in the previous M&V activities, the Coach is responsible for assuring data collected by the customer meets the program's data quality requirements.

4.5.2 Timing

M&V Activity #5: Model Application and Finalization, shall be completed by the end of Month 12.

4.5.3 Expected Outcomes

1. Finalization of Energy Consumption Model

4.5.4 Pre-requisites

1. M&V Activity #4: Participant Review of Hypothesis Model and Model Trial
2. Workshop #3: Tracking Performance 101

4.5.5 Deliverables

1. Update SEM Participant Tracking Report and deliver to the IOU PM before the end of Month 12.

4.5.6 Tools and Reference Documents

1. California Industrial SEM M&V Guide

4.6 M&V Activity #6: Collect Final Year 1 Data and Opportunity Register

4.6.1 Description

Final energy consumption and relevant variable data (per the Energy Data Collection Plan) for the initial 12-month performance period must be collected by the Coach and used to create the Year 1 savings calculations. It is imperative that this be done by the end of Month 13 so that final year 1 savings can be calculated and incentive checks can be delivered at Workshop #6. In addition, the Final Opportunity Register must be collected to allow for a bottom-up comparison of savings.

As discussed in the previous M&V activities, the Coach is responsible for assuring both the data collected by the customer and the opportunity register meet the program's data quality requirements.

The Coach must review data received from the customer to confirm the quality of the data for factors such as:

1. The time period of the data is correct and can be correlated
2. The data is in a format that the Coach can read and use
3. The data is for the relevant variables discussed with the Coach

4. The sources of data are as outlined in the energy accounting plan
5. Data is reviewed for outliers and if outliers need to be removed, that a record is maintained in the Energy Accounting Data Report

Timely review of the data by the Coach will allow the participant to correct any errors and meet the milestone incentive deadline.

In addition, the Coach must review the Opportunity Register to ensure that it:

1. Reflects the outcome of the Treasure Hunt and any other potential projects
2. Incudes a prioritization of potential projects
3. Includes estimated energy savings for high-priority projects

4.6.2 Timing

M&V Activity #6: Collect Final Year 1 Data and Opportunity Register shall be completed by the end of Month 13.

4.6.3 Expected Outcomes

1. Collection of 12 months of Year 1 energy and relevant variable data for Performance Period 1.
2. Collection of Final Year 1 Opportunity Register

4.6.4 Pre-requisites

1. M&V Activity #4: Model Application and Finalization

4.6.5 Deliverables

1. Update SEM Participant Tracking Report and deliver to the IOU PM before the end of Month 13

4.6.6 Tools and Reference Documents

None

4.7 Milestone Incentive #3: Final Data and Opportunity Register for Year 1

As mentioned earlier, milestone incentives are paid to each participant based on progress made in the program. Milestone incentives are paid as part of the incentive payment at the end of each

year; there are no mid-term payments and no exceptions to the milestone due date. If the milestone is not met by the due date, the payment is not made.

The table below identifies the milestone that must be met in order to receive the incentive. The SEM Coach must work with the IOU PM to establish specific due dates for each milestone at the start of SEM and to track the completion status of each milestone. The Coach is also expected to remind participants of milestone deadlines during Workshops and on-site meetings.

Milestone #	Milestone Requirement	Due Date	Incentive Amount
3	1. Provide program with approved 12-month post-baseline energy data and relevant variable data 2. Provide updated opportunity register to SEM Coach 3. Attend workshops #4 and #5 4. Implement at least one O&M project in year 1	End of Month 13	TBD by each utility

As discussed in: M&V Activity #1: Energy Data Collection Plan and Baseline Data Collection; the historical energy and relevant variable data must be screened by the Coach and meet the program's quality standards. Data provided that does not meet standards will not be eligible for the milestone incentive.

In addition, the Coach will ensure that confidentiality of the data is ensured at this and all milestones.

4.8 M&V Activity #7: Year-1 M&V Report and Technical Review

4.8.1 Description

As Year-1 of the SEM engagement concludes, the Coach will prepare the final savings analysis and create an M&V Report that, per the M&V Guide, details:

1. The Energy Data Collection Plan
2. Review of the baseline data
3. Documentation on the Energy Consumption Model
4. Energy Savings Calculations

Details for the M&V report can be found in the California Industrial SEM M&V Guide.

The Coach will review the M&V Report with the IOU PM, IOU AE, and IOU M&V Engineer, who may comment or ask for modifications to the report. After the review, the Coach will submit the final version of the M&V Report. The IOU has the option to review the outcomes of the technical review with the CPUC, primarily if there are: 1) significant potential savings from the customer, 2) anomalies in the modeling that should be proactively discussed, or 3) issues that were discussed with the CPUC in a previous review that warrant follow-up.

It is imperative that this review be done by the end of Month 14 so that final year 1 savings can be calculated and incentive checks can be delivered at Workshop #6.

4.8.2 Timing

M&V Activity #7: Year-1 M&V Report and Technical Review shall be completed by the end of Month 14 and 3 weeks before Workshop #6.

4.8.3 Expected Outcomes

1. Technical review with IOU
2. Final Year-1 M&V Report

4.8.4 Pre-requisites

1. M&V Activity #6: Model Application and Finalization

4.8.5 Deliverables

By the end of month 14, the SEM Coach will provide:

1. An updated SEM Participant Tracking Report
2. A Final Year-1 M&V Report

4.8.6 Tools and Reference Documents

1. California Industrial SEM M&V Guide

4.9 Site-Specific Activity #6: Year 1 Completion Report

4.9.1 Description

The SEM Coach is responsible for the production of the SEM completion report for each site in the cohort at the end of each engagement year. The completion report includes two sections, the first is a summary analysis of Energy Management System practices and energy projects

implemented during the course of the SEM program. The second section is a summary of the M&V report.

The IOU will use the completion report to determine incentive payments for each participating facility. *The SEM completion report must be approved by the IOU well ahead of Workshop 6, to ensure that incentive checks are available at the workshop.* The completion report also plays a major role in the savings validation by third-party evaluators.

The report must be completed to allow time for review and approval well ahead (three weeks or more) of Workshop 6. This is important because incentive checks will be delivered during Workshop 6 and there are many steps that must happen between the report's initial submission and approval. The SEM Coach shall work with the IOU PM and AE to develop a schedule for the report completion process that includes sufficient time for incentive check preparation before Workshop 6.

The SEM Coach shall gather key information into this document throughout the course of the engagement and get permission early on to take photos of each site's SEM activities and accomplishments throughout the year. Included shall be relevant photos in the completion report, especially photos that illustrate unique aspects of each site's work, both on implementing SEM practices and energy projects

4.9.2 Timing

The Year 1 Completion Report must be completed by the end of Month 14.

4.9.3 Expected Outcomes

The SEM completion report is designed to serve the needs of multiple audiences:

1. SEM participant – The report must provide participants with a clear picture of what they achieved during their engagement in the SEM program, including their energy savings and incentives. The content must be communicated in such a way that it facilitates a quick review and can be easily comprehended by the Executive Sponsor and other facility leadership.
2. IOU Program Manager and IOU staff – The report is intended to be a detailed review of accomplishment that helps IOU staff understand what the participant achieved.
3. Program evaluators – The report provides information that is critical for third-party program evaluators to fully understand what was achieved. This includes details on EnMS practices, energy savings projects and actions implemented and documented in the Opportunity Register, and elements found in the M&V report.

4.9.4 Pre-requisites

1. Development of a Completion Report template and review of template with IOU PM
2. Final M&V Report
3. Participation by facilities in Workshop #5

4.9.5 Deliverables

By the end of Month 14, the SEM Coach will provide:

1. A draft Completion Report (one per Participant), to the IOU PM, IOU AE and IOU M&V Engineer for review and comment.
2. A final Completion Report incorporating edits and comments, to the IOU PM.
3. An updated SEM Participant Tracking Report

4.9.6 Tools and Reference Documents

None

4.10 Incentive Payment #2: Year 1 Savings

Incentive checks shall be ready to be handed out at the sixth workshop. The SEM Coach will work with the IOU PM to coordinate check preparation. The checks will include incentives for Year 1 savings (per IOU guidelines).

5. ENERGY PLANNING, YEAR 2 *(MONTHS 14 THROUGH 17)*

5.1 Workshop #6: Saving Energy 201

5.1.1 Description

At Workshop #6, Participants will learn how to improve on elements learned in Workshop #2 and applied through the first year of the SEM engagement.

At this workshop, Participants will learn how to enhance their energy maps, implement more advanced energy savings projects, and better estimate the energy savings potential of projects. The technical focus of this workshop will be on retro-commissioning opportunities.

If needed, Participants will also receive additional data logging tools.

Participants will receive their incentive checks during this workshop, so the models must be updated and completion reports submitted (and approved) well in advance.

Recommended length of this workshop is 4 hours.

5.1.2 Timing

Workshop #6 must be completed by the end of Month 15.

5.1.3 Expected Outcomes

Workshop #6 learning objective include:

- Practicing more advanced calculations around electricity and gas use and savings (kWh, therms and dollars).
- Learning to track and prioritize varying savings opportunities.
- Learning more technical aspects of key energy-using subsystems, focusing on retro-commissioning efforts.
- Receiving additional data logging materials (if needed) and learning how to use them.
- Learning how to identify more advanced energy-saving opportunities.

Expected Attendees include at least:

1. The Energy Champion.
2. Energy Team Members.
3. IOU Account Executive
4. Attendance by the IOU PM is highly recommended

Expected commitments from the participant include at least:

1. Date confirmation for Workshop #7.
2. Final sign-up for a second Treasure Hunt.

5.1.4 Pre-requisites

1. Workshop #5
2. The Coach must check with each Energy Champion if additional Energy Data Logging toolkit materials are needed
3. Year-1 Completion Reports
4. Incentive Checks

5. Develop and review with the IOU PM:
    a. Workshop “Run of Show”: details on the sequence and timing of events for the workshop.
    b. Workshop presentation slides.
    c. A workshop workbook: a printed workbook that will be handed out to all participants.
    d. A more advanced presentation on technical aspects of energy subsystems, focusing on retro-commissioning efforts. Note that the IOU may provide information to support this training.

5.1.5 Deliverables

Within one week after each Workshop, the Coach is expected to deliver to the IOU PM and the IOU AE:

1. SEM Workshop Summary Report.
2. Update SEM Participant Tracking Report and deliver to the IOU PM

5.1.6 Tools

None

5.2 Site-Specific Activity #7: Energy Map 201

5.2.1 Description

The energy map shall be reviewed to ensure that assumptions made in the initial map are still valid. In addition, the second version of the energy map will add more detailed information based on their equipment inventory. For this phase, participants can gather nameplate and run-time data and perform more detailed calculations enabled by the tool. Although it requires more effort, completing a detailed energy map yields a more accurate view of how energy is used in the facility

Coaches must be available to assist participants as they complete a more detailed map.

5.2.2 Timing

The review and update of the Energy Map must be completed by the end of Month 17, before Workshop #7.

5.2.3 Expected Outcomes

The energy map update will include:

- Any significant changes in the energy consumed within a facility.
- A more detailed and accurate account of energy consumption based on nameplate and run-time.

5.2.4 Pre-requisites

1. Year-1 Energy Map

5.2.5 Deliverables

Within one week after completion, the participant will share the completed Energy Map to the SEM Coach. Within one week after receiving the Energy Map, the SEM Coach will:

1. Update SEM Participant Tracking Report and deliver to the IOU PM

5.2.6 Tools and Reference Documents

1. Energy Map Tool

5.3 Milestone Incentive #4: Updated Year 2 Data and Opportunity Register

As mentioned earlier, milestone incentives are paid to each participant based on progress made in the program. Milestone incentives are paid as part of the incentive payment at the end of each year; there are no mid-term payments and no exceptions to the milestone due date. If the milestone is not met by the due date, the payment is not made.

The table below identifies the milestone that must be met in order to receive the incentive. The SEM Coach must work with the IOU PM to establish specific due dates for each milestone at the start of SEM and to track the completion status of each milestone. The Coach is also expected to remind participants of milestone deadlines during Workshops and on-site meetings.

Milestone #	Milestone Requirement	Due Date	Incentive Amount
4	1. Provide program at least four months of approved energy and relevant variable data.	End of Month 17	TBD by each utility

	2. Provide updated opportunity register to SEM Coach 3. Attend workshop #6		

As discussed in previous Milestone Incentives, the historical energy and relevant variable data and opportunity register must be screened by the Coach and meet the program's quality standards. Data or opportunity registers provided that does not meet standards will not be eligible for the milestone incentive.

In addition, the Coach will ensure that confidentiality of the data is ensured at this and all milestones.

5.4 M&V Activity #8: Review and Update Year 2 Energy Consumption Model

5.4.1 Description

As the SEM engagement progresses into Year 2, the Coach and Participant must review the Energy Consumption Model to ensure that the model is still valid based on current operating conditions and production volumes. The review of the model shall include an analysis of year 2 energy and relevant variable data as well as a qualitative review of the facility's operations with the participant. If non-routine adjustments are necessary, the Coach must contact the IOU PM to schedule a technical review, which should focus on a review of the reasons for the non-routine adjustments and on the strategy for developing the Year 2 model and calculating Year 2 savings.

As in previous technical reviews, the IOU has the option to review the outcomes of the technical review with the CPUC, primarily if there are: 1) significant potential savings from the customer, 2) anomalies in the modeling that should be proactively discussed, or 3) issues that were discussed with the CPUC in a previous review that warrant follow-up.

As also discussed in the previous M&V activities, the Coach is responsible for assuring data collected by the customer meets the program's data quality requirements.

5.4.2 Timing

M&V Activity #8: Review and Update Year 2 Energy Consumption Model must be completed by the end of Month 18 and before Workshop #7.

5.4.3 Expected Outcomes

1. Delivery of at least four months of year 2 energy and relevant variable data by participant to Coach
2. Year 2 Energy Consumption Model Review and Update

5.4.4 Pre-requisites

1. M&V Activity #7: Year-1 M&V Report

5.4.5 Deliverables

1. At least four months of year 2 energy and relevant variable data by participant to Coach by the end of Month 17
2. Update SEM Tracking Report and deliver to the IOU PM by the end of Month 18
3. If a non-routine adjustment is necessary, a Technical Review must be completed by the end of Month 18

5.4.6 Tools and Reference Documents

1. California Industrial SEM M&V Guide

5.5 Site-Specific Activity #8: Treasure Hunt, Year 2

5.5.1 Description

As in the first year, the Treasure Hunt can have the highest impact on the success of a Participant's engagement in the SEM program. It should ignite enthusiasm among employees and set the stage for improving the facility's energy performance.

The primary goal of the Year 2 Treasure Hunt is to identify energy waste focused on retro-commissioning opportunities, with a review of O&M and capital project opportunities and potentially a focus on production areas or systems not covered in Year 1.

The SEM Coach plans and facilitates this event with the Energy Champion. The SEM Coach must work with the Energy Champion in advance to determine the scope of the Treasure Hunt. Generally, the entire facility is the focus rather than individual systems, although in the second year the Treasure Hunt can provide more detail on the largest systems. This can be adapted and narrowed as needed in specific situations. Some facilities are so large that the SEM focus must be on a system or specific engagement boundary, rather than being all-encompassing. The SEM Coach should ask the host if they are interested in inviting one or two of their SEM peers to attend

and contribute to the Treasure Hunt. This often results in valuable sharing of best practices and deepens relationships between peers. If the host is interested, the Coach should coordinate attendance of other Energy Champions at the Treasure Hunt.

The IOU AE is expected to attend the Treasure Hunt and help support the process. The SEM Coach shall coordinate with the IOU AE to ensure the IOU AE can attend and to discuss if additional IOU resources are needed or expected to support a successful Treasure Hunt. After the Treasure Hunt concludes, the Coach will teach the facility's energy team how to estimate energy savings for projects identified during the Treasure Hunt.

All projects, including O&M, retro-commissioning, and Capital projects identified in the Treasure Hunt must be documented in the Opportunity Register. The Coach must ensure that capital projects identified be documented in accordance with any additional IOU requirements, which may require documentation outside of the opportunity register.

5.5.2 Timing

The Year 2 Treasure Hunt must be completed before Workshop #7 and by the end of Month 17.

5.5.3 Expected Outcomes

The Treasure Hunt is intended to teach participants to:

- Learn to identify energy waste, focusing on retro-commissioning opportunities
- Feel empowered to take actions that save energy immediately
- Identify the next round of low- and no-cost energy-saving projects that will become the focus of the 2nd Year in the SEM program
- Increase awareness of how energy is used and wasted in their facility
- Review practical hands-on approaches to using the data-logging toolkit
- Gain more experience that will help them perform their own routine Treasure Hunts in the future
- Review how to prioritize energy saving measures
- Review how to track energy savings measures using the opportunity register

5.5.4 Pre-requisites

1. Year 1 Treasure Hunt
2. Workshop #6- Saving Energy 201
3. Year 2 Energy Map
4. Energy Logging Toolkit Update, if necessary

5.5.5 Deliverables

After conducting the Treasure Hunt, the SEM Coach will:

1. Within two weeks, meet with the energy team to estimate energy savings from the projects listed in the opportunity register and receive a copy of the opportunity register.
2. Complete the Treasure Hunt Report and deliver to the IOU PM and IOU AE
3. Within one week, update SEM Participant Tracking Report and deliver to the IOU PM

5.5.6 Tools and Reference Documents

1. Data Logging Toolkit
2. Energy Map Tool
3. Opportunity Register
4. Treasure Hunt Report Template

6. IMPLEMENTATION, YEAR 2 *(MONTHS 18 THROUGH 26)*

6.1 Workshop #7: Tracking Energy Performance 201

6.1.1 Description

Workshop #7 gives participants tools and methods for understanding and tracking energy performance at a deeper level using an Energy Management Information System (EMIS). In this context, an Energy Management Information System can be any means that helps participants track key independent variables at regular time intervals to develop a meaningful, normalized energy use profile and visualize that profile for the appropriate staff. Although not required, many times this includes metering hardware and/or electric and natural gas energy data collection software.

Any hardware or software needed for the EMIS must be installed and owned by the Participant.

An important objective of this workshop is for participants to understand that no matter how they are currently tracking key facility and energy data, an EMIS that is designed to fit their situation can help drive better decisions within and across facilities. In this workshop, participants will explore how to right-size and prioritize where an EMIS system can have an impact, how it can be integrated into existing control and reporting systems, and how an EMIS can be implemented to supplement their SEM program.

Recommended duration of this workshop is 4 hours.

6.1.2 Timing

Workshop #7 must be completed by the end of Month 19.

6.1.3 Expected Outcomes

Workshop #7 learning objectives include:

- Learning the value of an Energy Management Information System
- Learning methods, options, and tips for designing and implementing an EMIS
- Developing a long-term plan for implementing an EMIS
- Learning how to use an EMIS
- Learning about support and resources available to support EMIS implementation

Expected Attendees include at least:

1. The Energy Champion
2. Data Master
3. Selected Energy Team Members

Expected commitments from the participant include at least:

1. Date confirmation for Workshop #8

6.1.4 Pre-requisites

1. Workshop #6
2. Develop and review with the IOU PM:
    a. Workshop "Run of Show": details on the sequence and timing of events for the workshop.
    b. Workshop presentation slides.
    c. A workshop workbook: a printed workbook that will be handed out to all participants.

6.1.5 Deliverables

Within one week after each Workshop, the Coach must to deliver to the IOU PM and the IOU AE:

1. SEM Workshop Summary Report
2. Update SEM Participant Tracking Report

6.1.6 Tools and Reference Documents

None

6.2 Site-Specific Activity #9: EMIS Planning and Implementation Support

6.2.1 Description

An EMIS can provide significant support to a facility's SEM program as it can give many staff, including management, supervisors, and operators, tools and methods for understanding and tracking energy performance at a deeper level. In this context, an Energy Management Information System can be any means that helps participants track key independent variables at regular time intervals to develop a meaningful, normalized energy use profile and visualize that profile for the appropriate staff.

An EMIS needs to be sized to fit the capabilities, needs, and abilities of a facility. The Coach can play an important role in helping the facility ensure the system is designed and implemented properly and can help ensure it is used by appropriate staff. Although the program will not provide financial support, the Coach will provide advice and support.

Any hardware or software needed for the EMIS must be installed and owned by the Participant.

6.2.2 Timing

The EMIS Planning and Implementation Support (EMIS Support) must be completed before Workshop #8 and by the end of Month 24.

6.2.3 Expected Outcomes

The Coach's EMIS support is intended to support participants as they:

- Prioritize and define the scope of system.
- Define the equipment (software and hardware).
- Define the dashboard system and types/frequency of reports.
- Review vendor quotes (if needed).
- Set up reports.

6.2.4 Pre-requisites

1. Workshop #7- Tracking Energy Performance 201

6.2.5 Deliverables

After completing the EMIS Support, the SEM Coach will:

1. Within one week, update SEM Participant Tracking Report and deliver to the IOU PM

6.2.6 Tools

None

6.3 Site-Specific Activity #10: Energy Management Assessment, Year 2

6.3.1 Description

The Energy Management System Assessment is a facilitated review of each facility's Energy Management System practices. The results of the EnMS Assessment help each participating site assess their progress and plan for continued improvement of both their EnMS and energy performance.

Each facility will have their second EnMS Assessment performed between Workshops 6 and 8. Workshop 4 introduced the EnMS Assessment and Workshop 5 explained and interpreted the first-year results. The EnMS Assessment occurs at each participant's site, and is facilitated by the SEM Coach.

The Coach must select an EnMS Assessment Tool that allows for a facilitated conversation to identify and characterize EnMS practices at an industrial facility. The EnMS Assessment tool should include questions on all aspects of an EnMS, as defined by this Guide. The session should take between 3 and 5 hours to administer, including time to introduce the EnMS Assessment and review results. A summary must be provided immediately.

The EnMS Assessment Tool must cover, at a minimum, elements that analyze the organization's:

4. Organizational and management commitment to energy management: this section should include questions on policy and goals, allocation of resources and funds, and communication.
5. Ability to plan and implement energy improvements: this section should include questions on project management, employee engagement, and reassessment of both EnMS practices and energy improvement projects.
6. Ability to measure and report energy consumption: this section should include questions on data collection and availability, energy information analysis, and energy performance reporting.

6.3.2 Timing

The Year 2 Energy Management System Assessment must be completed before Workshop #8 and by the end of Month 23.

6.3.3 Expected Outcomes

The EnMS Assessment is intended to teach participants to:

- Recognize what they have accomplished with respect to EnMS practices
- Recognize where they have room for improvement
- Use the EnMS Assessment results to inform a plan to improve their EnMS practices as SEM year 2 draws to a close
- Learn the EnMS Assessment tool so they can use it independently in the future.

Expected Attendees:

1. The Energy Champion
2. The Executive Sponsor
3. Energy Team Members
4. Selected Facility leadership staff
5. The Account Executive is strongly encouraged to attend

6.3.4 Pre-requisites

1. Workshop #7- Tracking Performance 201

6.3.5 Deliverables

After conducting the EnMS Assessment, the SEM Coach will:

1. Within one week, update SEM Participant Tracking Report and deliver to the IOU PM

6.3.6 Tools and Reference Documents

1. Energy Management System Assessment Tool

6.4 Workshop #8: Celebrating SEM Accomplishments & Planning for the Future

6.4.1 Description

Workshop #8 provides an opportunity to recognize the participants' accomplishments and generate enthusiasm for continuing engagement in the SEM program. Participants have worked hard for two years; this workshop provides a forum for both their peers and management to recognize the work they have done and hear what they have planned for the future.

The SEM Coach must work with each Energy Champion ahead of time to prepare a 15 to 20-minute presentation explaining the story and outcomes through their engagement with the SEM program.

It is important that Executive Sponsors attend this workshop so they can hear about their team's success and about the successes other teams experienced. Executive Sponsors will have an opportunity to vocalize their team's top accomplishments. All Participants will receive certificate of accomplishment.

Recommended duration of this workshop is 4 hours.

6.4.2 Timing

Workshop #8 must be completed by the end of Month 24.

6.4.3 Expected Outcomes

Workshop #8 learning objectives include:

- Practicing how to present their EnMS and energy savings accomplishments.
- Articulating how and where energy is used at their facility.
- Describing their next steps in the SEM process, both for their EnMS and energy savings.
- Demonstrating their ability to speak the language learned through their engagement with the SEM program.
- Learning about a second SEM program engagement and other resources available to support their EnMS and energy efficiency efforts.

Expected Attendees include at least:

1. The Energy Champion
2. Energy Team Members

3. The Executive Sponsor and other facility leadership
4. IOU PM
5. IOU executive staff
6. IOU Account Executive
7. IOU evaluation staff

6.4.4 Pre-requisites

1. Workshop #7
2. Develop and review with the IOU PM:
    a. Workshop "Run of Show": details on the sequence and timing of events for the workshop.
    b. Workshop presentation slides.
    c. A workshop workbook: a printed workbook that will be handed out to all participants.

6.4.5 Deliverables

Within one week after each Workshop, the Coach is expected to deliver to the IOU PM and the IOU AE:

1. SEM Workshop Summary Report.
2. Update SEM Tracking Report and deliver to the IOU PM

6.4.6 Tools and Reference Documents

None

6.5 M&V Activity #9: Collect Year 2 Data and Opportunity Register

6.5.1 Description

Final energy consumption and relevant variable data (per the Energy Data Collection Plan) for the second 12-month performance period will be collected by the Coach. It is imperative that this be done by the end of Month 25 so that final year 2 savings can be calculated and incentive checks can be delivered to the Participant in a timely manner. In addition, the final Opportunity Register should be collected to allow for a bottom-up comparison of savings.

As discussed in the previous M&V activities, the Coach is responsible for assuring data and opportunity registers collected meet the program's data quality requirements.

The Coach must review data received from the customer to confirm the quality of the data for factors such as:

1. The time period of the data is correct and can be correlated
2. The data is in a format that the Coach can read and use
3. The data is for the relevant variables discussed with the Coach
4. The sources of data are as outlined in the energy accounting plan
5. Data is reviewed for outliers and if outliers need to be removed, that a record is maintained in the Energy Accounting Data Report

Timely review of the data by the Coach will allow the participant to correct any errors and meet the milestone incentive deadline.

In addition, the Coach must review the Opportunity Register to ensure that it:

1. Reflects the outcome of the Treasure Hunt and any other potential projects
2. Incudes a prioritization of potential projects
3. Includes estimated energy savings for high-priority projects

6.5.2 Timing

M&V Activity #9: Collect Year 2 Data and Opportunity Register should be completed by the end of Month 25.

6.5.3 Expected Outcomes

1. 12 months of approved energy and relevant variable data for Performance Period
2. Final approved Year 2 Opportunity Register

6.5.4 Pre-requisites

1. M&V Activity #8: Review and Update Year 2 Energy Consumption Model

6.5.5 Deliverables

1. 12 months of year 2 energy and relevant variable data by participant to Coach
2. Update Report #7: SEM Tracking Report and deliver to the IOU PM

6.5.6 Tools and Reference Documents

None

6.6 Milestone Incentive #5: Final Year-2 Energy Data and Opportunity Register

As mentioned earlier, milestone incentives are paid to each participant based on progress made in the program. Milestone incentives are paid as part of the incentive payment at the end of each year; there are no mid-term payments and no exceptions to the milestone due date. If the milestone is not met by the due date, the payment is not made.

The table below identifies the milestone that must be met in order to receive the incentive. The SEM Coach must work with the IOU PM to establish specific due dates for each milestone at the start of SEM and to track the completion status of each milestone. The Coach is also expected to remind participants of milestone deadlines during Workshops and on-site meetings.

Milestone #	Milestone Requirement	Due Date	Incentive Amount
5	1. Provide program with final 24 months of energy and production data 2. Provide updated opportunity register to SEM Coach 3. Attend workshops #7 and #8 4. Implement at least one O&M project in year 2	End of Month 25 After Workshop #8	TBD by each utility

As discussed in previous Milestone Incentives, the historical energy and relevant variable data, as well as the opportunity register, must be screened by the Coach and meet the program's quality standards. Data provided that does not meet standards will not be eligible for the milestone incentive.

In addition, the Coach will ensure that confidentiality of the data is ensured at this and all milestones.

6.7 M&V Activity #10: Year 2 M&V Report and Technical Review

6.7.1 Description

As the SEM engagement concludes, the Coach will prepare the final savings analysis and create an M&V Report that details:

1. The Energy Data Collection Plan
2. A review of the baseline data

3. Documentation on the Energy Consumption Model
4. Energy Savings Calculations

Details for the M&V report can be found in the California Industrial SEM M&V Guide.

The Coach will review the M&V Report with the IOU PM, IOU AE, and IOU M&V Engineer, who may comment or ask for modifications to the report. After the review, the Coach will submit the final version of the M&V Report. The IOU has the option to review the outcomes of the technical review with the CPUC, primarily if there are: 1) significant potential savings from the customer, 2) anomalies in the modeling that should be proactively discussed, or 3) issues that were discussed with the CPUC in a previous review that warrant follow-up.

It is imperative that this review be done by the end of Month 26 so that final year 1 savings can be calculated and incentive checks can be delivered in a timely manner.

6.7.2 Timing

M&V Activity #9: M&V Report and Technical Review should be completed by the end of Month 26.

6.7.3 Expected Outcomes

1. Final Year 2 M&V Report

6.7.4 Pre-requisites

1. M&V Activity #8: Year 2 Model Review and Update
2. M&V Activity #9: Collect Year 2 Data and Opportunity Register

6.7.5 Deliverables

1. Update SEM Participant Tracking Report and deliver to the IOU PM
2. Final Energy Model Report and Year 2 Model to the IOU PM

6.7.6 Tools and Reference Documents

1. California Industrial SEM M&V Guide

6.8 Site-Specific Activity #11: Year 2 Completion Report

6.8.1 Description

The SEM Coach is responsible for the production of the SEM Completion Report (Completion Report) for each site in the cohort and the second-year report will build on the first-year report.

The completion report includes two sections, one providing a summary analysis of EnMS practices and energy projects implemented during the course of both years of SEM. The second being the M&V Report.

The IOU will use the completion report to in determine incentive payments for each participating company. *The SEM completion report must be approved by the IOU well ahead of the incentive check deadline, to ensure that incentive checks are delivered on time.* The completion report also plays a major role in the savings validation by third-party evaluators. The SEM Coach should work with the IOU PM and AE to develop a schedule for the report completion process that includes sufficient time for incentive check preparation.

The SEM Coach should gather key information into this document throughout the course of the engagement and get permission early on to take photos of each site's SEM activities and accomplishments throughout the year. Included should be relevant photos in the completion report, especially photos that illustrate unique aspects of each site's work, both on implementing SEM practices and energy projects

6.8.2 Timing

The Year 2 Completion Report must be completed by the end of Month 26.

6.8.3 Expected Outcomes

Similar to the first-year report, the SEM completion report is designed to serve the needs of multiple audiences:

1. SEM participant – The report must provide participants with a clear picture of what they achieved during the SEM program, including their energy savings, implemented projects, EnMS accomplishments, and incentives. The content must be communicated in such a way that it facilitates a quick review and can be easily comprehended by the Executive Sponsor and other facility leadership.
2. IOU Program Manager and IOU staff – The report is intended to be a detailed review of accomplishment that helps IOU staff understand what the participant achieved.

3. Program evaluators – The report provides information that is critical for third-party program evaluators to fully understand what was achieved. This includes details on EnMS practices as well as elements found in the M&V Report section.

6.8.4 Pre-requisites

1. Year 2 M&V Report
2. Workshop #8

6.8.5 Deliverables

Similar to the year 1 report, the SEM Coach will provide:

1. A draft Completion Report (one per participant) to the IOU PM, IOU AE and IOU M&V Engineer for review and comment.
2. A final Completion Report incorporating edits and comments.
3. A final SEM Participant Tracking Report

6.8.6 Tools and Reference Documents

None

6.9 Incentive Payment #2: Year 2 Savings and Milestones

Incentive checks shall be ready to be handed to participants within one month after at Workshop #8. The SEM Coach will work with the IOU PM to coordinate check preparation. The checks will include incentives for savings (per IOU guidelines) and for SEM milestones.

7. REPORTING REQUIREMENTS

The Design Guide requires multiple reports. The Coach will be responsible for ensuring that are reports are completed and follow the requirements of the Design and M&V Guides. In addition, the Coach will ensure that reports, key conversations, documents, etc., are stored in an appropriate manner that allows for review or analysis from the program or evaluation.

Reports called out in this guide include:

7.1 Scoping Report

The Scoping Report allows both the SEM program and evaluators to understand the conditions that existed at each facility prior to SEM engagement. There must be one report per facility, which shall include:

- **Company Overview and Background**: describing relevant details that might influence the SEM program, such as ownership structure, management structure, corporate energy or sustainability programs, quality or certification programs)
- **Site Description**: describing the type of product manufactured, hours of operation, seasonality (if applicable), suggested site boundary for SEM engagement, and a map of the site (if available)
- **SEM Readiness**: describing the site's ability and willingness to dedicate staff to the engagement, who the Energy Champion and Executive Sponsor would be, any major process changes that are planned, experience with Lean, Six Sigma, etc., sustainability or energy goals and teams
- **Energy Efficiency History and Plans**: describing any relevant relationship with utility programs (account executive, 3rd party contractors, etc.), project activity and history, pending projects, planned major capital projects. Also, any measures the AE/Coach recommend be included or excluded, existing plans with the utility or 3rd parties
- **Energy Data Availability**: describing the number of meters on site (and if possible what the meters are tied to and the percentage of load they represent), any available sub-metering, if utility data or bills is available for 12-24 months, any systems used for tracking energy use, any interval data availability or plans
- **Production Data Availability**: describing how the site tracks production data including what they track, how frequently, the methods for recording and reporting the data, and whether the data can be provided to the SEM Coach before the kick-off meeting
- **Savings Potential**: including estimated annual energy consumption (kWh, Therm, other), estimated savings, utility rate schedule, $/energy source (kWh, Therm, other)
- **Recommended Next Steps**: Recommendations on next steps the program should take with this participant.

7.2 SEM Participant Tracking Report

The SEM Participant Tracking Report allows the program to track key customer information, progress with each participant, and the date of key activities and workshop. This report must include:

- **General Cohort information:** including the name of the cohort, the start of the engagement period, the start of the reporting period, and milestone dates.

- **General information for each facility**: including the name of the company, location of the facility, the SEM Coach, the Account Executive, the facility's electricity and natural gas goals, approximate annual consumption of electricity and natural gas, the names of the participant's staff (energy champion, executive sponsor, data owner).
- **Key activities for each facility**: including date the energy team was established, date the energy data collection plan was completed, date baseline data was collected, whether each of the milestones was achieved, date of each workshop, date hypothesis models were reviewed by the IOU, date hypothesis model was handed off to the customer, date energy maps were completed, date of treasure hunts, date the opportunity register was created and shared with the SEM coach, date the updated model was reviewed with the customer (and whether the updated model was reviewed with the IOU), date initial employee engagement activity was implemented, date energy models were finalized (for each reporting period), date final year data and opportunity register were collected (for each reporting period), date M&V reports were completed and reviewed by IOU (for each reporting period), date completion reports were completed and approved by IOU (for each reporting period), date of initial EMIS activities, dates of EMA's (for each reporting period).
- **Key issues for each facility**: Any issues that the IOU PM should know or that need to be documented, relative to each facility, should be noted in the report.

7.3 SEM Workshop Summary Report

The Workshop Summary Report allows both the program and evaluators to understand who attended and what happened at each workshop. The Coach must provide a Workshop Summary Report for each workshop. The report must include:

- **General workshop information:** including the name, the location, the time, and the date of the workshop
- **Attendees:** all attendees, separated by workshop attendees, utility attendees, implementation contractor attendees, and other attendees (such as presenters)
- **Summary of the workshop:** including a summary of the attendance, presenters, agenda, key activities, materials provided to the participants
- **Presentations:** including a summary of the presentations given, including key questions asked and how the presentations were received.
- **Group Activities:** including a summary of any group activities conducted during the workshop, how they were received, and the outcome of the activities.
- **Conclusion:** including a summary of any prizes, incentive payments, or awards handed out during the workshop. Also, including any homework or next steps assigned to participants during the workshop.

- **Feedback:** a summary of the evaluation of the workshop provided by the participants, including any specific feedback given. The form must have the workshop name on it, the date, and an optional name field for the participant to fill out. The workshop feedback form must include a rating from 1-5 (five being the best rating) on:
    - Whether the workshop met expectations for gaining new information on the topic
    - Whether the coaches presented information in an effective way
    - Whether the workbook for the session is something the participant will refer to in working with their energy team
    - Whether the preparation homework for the session helped the participant prepare for the workshop and apply new principles at their site.
    - Whether the participant left the workshop with specific ideas for how to improve their approach to the SEM program.
    - How the participant would rate their overall experience in the workshop.

  The feedback form must also include an area for the participant to comment on any item that rated three or lower, to comment on anything they would have liked to have spent more time on, and to provide any comments they would like to add.

7.4 M&V Report

The M&V Report provides details for the energy data, energy adjustment models, and energy savings calculations for each facility during the reporting period. The Coach must provide a separate M&V Report for each facility for every reporting period. As outlined in the California Industrial SEM M&V Guide, the report must include three sections: An Energy Data Collection Plan, an Energy Data Report, and an Energy Savings Calculation Report. Details for the M&V report and for each of these sections are outlined in the California Industrial SEM M&V Guide.

7.5 Completion Report

The Completion Report provides details for the accomplishment of each facility during the reporting period. The Coach must provide a separate Completion Report for each facility for every reporting period. The report must include:

- **An executive summary:** the executive summary should be two pages or less and briefly summarize the accomplishments (energy savings), incentives, and persistence strategies implemented. Any graphics or charts that help explain those topics shall be included.
- **An overview of the SEM program:** including any details on when the program began, when the final event or workshop was held, and a summary of the key activities.
- **A summary of the EnMS practices implemented:** including details on the energy team (i.e. participants, date formed, etc.), energy commitment and goals, employee

engagement, energy map, energy treasure hunt, energy performance tracking, energy management information system, energy management system assessment, EnMS persistence plans.

- **A summary of Energy Projects implemented**: including details on the opportunity register (i.e. when collected, owner, etc.), details on energy projects identified, details on energy projects completed, incented and custom capital projects identified and completed.
- **A summary of the M&V Report:** including a summary of the energy data collection plan (time periods, facility boundaries, energy consumption data, relevant energy data), a summary of the energy data report, and a summary of the energy savings calculation report.
- **A summary of incentives**: including details on milestone incentives, energy saving incentives for any reported energy savings as outlined in the California Industrial SEM M&V Guide, Annex E.
- **An Appendix**: including any photos that illustrate EnMS practices and energy savings projects. The appendix must also include files for the energy map, opportunity register, EnMS Assessment results, the participant's presentation for workshop 8, and any other relevant documents.

7.6 Treasure Hunt Report

The Treasure Hunt Report provides details on the outcomes of the Treasure Hunt and is provided to both the Participant and the IOU. The Coach must provide a separate Treasure Hunt Report for each facility for each reporting period. The report must include:

- **Background**: including all participants in the Treasure Hunt (including any guests or technical support), a summary of the process followed during the Treasure Hunt.
- **Recommended Energy Saving Opportunities**: this section must include all actions identified during the Treasure Hunt, including O&M, capital, retrocommissioning, etc. The opportunities must have energy saving estimates (for each fuel), estimates for the amount of cost or effort required to achieve the savings, potential owner (staff at the facility), and the type of project (O&M, capital, retro-commissioning). Opportunities must be categorized in a table by the following categories:
  - High Savings, Low Cost/Effort
  - Low Savings, Low Cost/Effort
  - High Savings, High Cost/Effort
  - Low Savings, High Cost/Effort

  The total savings for each category and the total for all categories must be shown by fuel.
- **Next Steps**: this section will highlight next steps necessary to implement identified opportunities, especially if coordination with other IOU staff or programs is necessary.

- **Capital Projects**: this section should list out the capital projects (the opportunity, energy savings by fuel) and a short summary of what next steps are needed (i.e. additional analysis, discussion on incentives, etc.)
- **Opportunity Register**: this section must make clear that the Opportunity Register is the approved tool for tracking all the opportunities identified and should provide a short summary of who is responsible for maintaining the Opportunity Register and at what time periods.

7.7 Opportunity Register

The Opportunity Register is one of the most important reports in the SEM program. It helps the customer prioritize and track opportunities and supports the program in recording both influence and savings. An Opportunity Register must be created separately for each facility. The Opportunity Register must include:

- **Energy Saving Opportunities**: this section of the Opportunity Register lists out potential energy saving projects and must have five sections for each opportunity listed:
  - **A general description**: including a reference number, a description of the opportunity.
  - **An "identify" section**: including the location, process area/system or cost center it impacts, the type of activity (operational, capital, process, maintenance, or other), and who it was submitted by.
  - **A "prioritize" section**: including the energy impact (by category, i.e. low or high), energy saving estimate by fuel, the cost/effort required (by category, i.e. low or high), and the decision the facility is making on whether to implement the opportunity (i.e. implement now, implement later, not implement)
  - **An "implement" section**: including a brief description of what the next steps are (or the required actions to complete), who the opportunity is assigned to, the target due date, the actual date the opportunity was completed, and the current status of the opportunity.
  - **An "ensure persistence" section**: including the risk of backsliding (or how likely it is that the energy savings from this project will decline without regular attention paid by key personnel), a summary of the strategy for ensuring energy savings persist in the long term (this should likely be documented more fully elsewhere), whether or not the strategy was implemented, and a review date for the persistence strategy.
- EnMS Opportunities: this section lists out opportunities to improve the Energy Management System (i.e. improvements to the energy team, employee engagement, goals or policies, reporting to management or employees, employee training, etc.). Similar

to energy saving opportunities, EnMS opportunities must have five sections for each opportunity listed:

- **A general description**: including a reference number, a description of the opportunity and any relevant notes.
- **An "identify" section**: including who it was submitted by.
- **A "prioritize" section**: including the impact to the EnMS (by category, i.e. low or high), the cost/effort required (by category, i.e. low or high), and the decision the facility is making on whether to implement the opportunity (i.e. implement now, implement later, not implement).
- **An "implement" section**: including a brief description of what the next steps are (or the required actions to complete), who the opportunity is assigned to, the target due date, whether the opportunity is recurring, the recurring schedule (if recurring), the actual date the opportunity was completed, and the current status of the opportunity.
- **An "ensure persistence" section**: including the risk of backsliding (or how likely it is that the practice resulting from this opportunity will not be followed without regular attention paid by key personnel), a summary of the strategy for ensuring the practice persists in the long term (this should likely be documented more fully elsewhere), whether or not the strategy was implemented, and a review date for the persistence strategy.

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