



Sample Design Details: *Create a New SEM Program using 50001 Ready*

Version 1.0

1. INTRODUCTION

This document is provided for energy efficiency program administrators and implementers that want to create a new SEM program using 50001 Ready. It is meant as a starting point and reference as they make decisions about their program.

Benefits of this program include:

1. An expanded portfolio of energy efficiency offerings with a Strategic Energy Management (SEM) Program based on ISO 50001 best practices.
2. Claiming of savings from operations and maintenance (O&M) and business-practice (or behavioral) energy efficiency projects.
3. The development of a pipeline of capital and custom energy efficiency projects.
4. Leverage of DOE's world-class resources to create value for customers while minimizing program development and implementation costs.
5. Ability to provide industrial and large commercial customers with national recognition from US DOE.

This sample design is based on US DOE's award-winning 50001 Ready Navigator, an online guide to establish or enhance an energy system, and is supported by a variety of tools and resources publicly available from US DOE.

1.1 What is 50001 Ready?

50001 Ready is an online easy-to-use and structured approach for facilities to establish a continuous energy improvement practice in conformance with the ISO 50001 voluntary standard for energy management systems in industrial, commercial, and institutional facilities. ISO 50001 is designed to link the C-suite with facility personnel to better value and plan for energy improvement. The standard is complementary to other professional benchmarks and certifications, such as ENERGY STAR or LEED; implementation of an ISO 50001 structure can improve a facility's performance within other energy commitments or credentials. 50001 Ready offers:

1. 50001 Navigator, an on-line application that provides step-by-step guidance and tools to implement ISO 50001 practices without certification
2. Guidance to identify facility-wide energy use and develop action plans for performance improvement
3. Ability for a 3rd party implementer to provide technical support and help desk functions as needed
4. A means to quantify and track overall facility energy savings across all fuels, including the ability to separate capital projects from operations and maintenance (O&M) improvements
5. 50001 Ready recognition upon accomplishment of self-attested achievement, without external audits

1.2 What value does 50001 Ready bring to program administrators and implementers?

50001 Ready resources are designed to be handed off to program implementers—including utilities, states, municipalities, public benefits administrators, disclosure groups, and other membership organizations—and can be used in a variety of ways to supplement their existing programs. 50001 Ready can be structured either as an energy program or as a customer engagement platform for increased customer satisfaction.

Energy Program. Offering an energy program around 50001 Ready allows utilities, implementers and customers to work together to build a long-term pipeline of improvement opportunities and to quantify

O&M savings. 50001 Ready resources can also provide the foundation for Strategic Energy Management¹ (SEM) or Continuous Energy Improvement (CEI) programs.

Customer Satisfaction. Offering 50001 Ready as a customer satisfaction approach allows utilities and implementers to provide a service for key customers to assist in their understanding, planning and managing energy improvements. Utilities and implementers can offer the 50001 Ready tools and provide customer support to maintain contact throughout the process.

More details on 50001 Ready and ways it can be used by a Program Administrator can be found on [DOE's 50001 Ready website](#).

1.3 What are the 50001 Ready Sample Designs?

The 50001 Ready SEM Sample Designs (Sample Designs) are examples that highlight how energy efficiency program administrators and implementers can use 50001 Ready to enhance or supplement their existing offerings. They provide sample pathways to integrating 50001 Ready, ranging from on-line workshops to multi-year SEM programs and are available on DOE's 50001 Ready website.

All Sample Designs use 50001 Ready Navigator (Navigator) as the backbone for helping a customer implement and maintain an energy management system in conformance with ISO 50001. Appendix 1 lists the 25 tasks defined by 50001 Ready Navigator.

The reference designs are all organized by units. The units help to organize objectives and outcomes into a clear timeframe, for both the program and the customer. They help clarify objectives and activities into distinct timelines. Depending on the resources available to a program and the chosen design goals, units might include both workshops and individual activities. A unit could last anywhere from one month to six months, depending on both the length of the overall program and the objectives of the unit.

¹ Strategic Energy Management or SEM is the name used by program administrators who worked with the Consortium for Energy Efficiency's (CEE) industrial SEM initiative to define "a continuous improvement approach to reducing energy intensity over time...". More details on CEE's Industrial SEM Initiative are available at: <https://library.cee1.org/content/cee-industrial-strategic-energy-management-initiative/>

2. SAMPLE DESIGN DETAILS: CREATE A NEW SEM PROGRAM USING 50001 READY

This Sample Design gives an example of how a utility looking to launch a new Strategic Energy Management (SEM) program as part of its portfolio of energy efficiency offerings can use 50001 Ready to design their program. The design assumes that the utility or program:

1. Has a sufficient number of industrial and/or large commercial customers that are interested in the program to run a small group of at least three to five facilities.
2. Has the ability to run a two-year program.
3. Has experience offering a mix of incentives, audits, and technical support for custom projects that include operational or process improvements
4. Wants to claim savings from Operations and Maintenance (O&M) and business-practice (behavior) efficiency projects.

If your program does not meet these assumptions, you can use [DOE's SEM Program Design tool](#) to help you think through other design options.

This design is used to guide a group of customers through Navigator's 25 tasks and is separated into seven units. Each unit contains a combination of workshops and site-specific activities. Details on why the sample designs contain workshops and site-specific activities can be found [here](#).

Details, including timing, on each of the units, each of the workshops, and each of the site-specific activities are found in the following sections. If you are interested in other designs or have questions or feedback please contact **Sandy Glatt at sandy.glatt@ee.doe.gov**.

2.1 Unit 1: Planning

	Workshop	Site-Specific Activities	Navigator Tasks Covered ²	Navigator Tasks Completed ³
Planning <i>months 1-2</i>	Workshop #1: <i>Planning</i>	Kick-off Meeting Data Collection Plan Baseline Data Collection	1: Scope and Boundaries 2: Energy Policy 3: Management Commitment 4: Energy Team 5: Legal Requirements 6: Data Collection 9: Relevant Variables	1: Scope and Boundaries 2: Energy Policy 3: Management Commitment 4: Energy Team 5: Legal Requirements

Unit 1 introduces the facility staff to the overall program and to the process of setting up an EnMS that is aligned with 50001 Ready. The goal of this unit is to set up the infrastructure that will help facility staff meet the program goals. This unit closely follows the five tasks of the Planning Section in the 50001 Ready Navigator and covers two additional tasks from the Energy Review Section.

The **Kick-Off Meeting**, which is held before the workshop, introduces each plant manager and key facility staff to the requirements of the program and to their responsibilities within the program. It also introduces facility staff to the steps needed to identify and collect related energy consumption and relevant variable data and helps them develop a draft **Data Collection Plan** that documents how they will collect and share relevant **Baseline Data**.

Workshop #1, which typically lasts 8 hours, introduces facility staff to the program approach, timing and requirements and gives them practical guidance in setting up their EnMS. It allows facility staff to begin to work on and share thoughts on:

1. Task 1: The definition and documentation of the scope and boundaries of the EnMS,
2. Task 2: The development and approval of an energy policy,
3. Task 3: The commitment required from and the roles and responsibilities of top management,
4. Task 4: The establishment and the roles and responsibilities of an energy team,
5. Task 5: The identification and documentation of energy-related legal requirements,
6. Task 6: The identification and collection of related energy consumption data, and
7. Task 9: The determination and documentation of relevant variables that affect energy consumption.
8. Task 15: Ensuring energy monitoring and measurement activities are accurate and repeatable
9. Task 25: Holding periodic review of the Energy Management System with top management

After the workshop, program staff and facility staff together will review the draft **Data Collection Plan** and discuss potential updates. It is also expected that facility staff will share with program staff prior to the end of the unit any collected **Baseline Data** in preparation for Unit 3: Energy Review.

² Navigator Task Covered means the task is introduced in this unit but not necessarily completed before the next unit begins.

³ Navigator Tasks Completed means the task is finished per the Navigator Tool before the next unit begins.

2.2 Unit 2: Energy Review

	Workshops	Site-Specific Activities	Navigator Tasks Covered	Navigator Tasks Completed
Unit 2 Energy Review <i>months 3-6</i>	Workshop #2: <i>Energy Review</i>	Energy Footprint Treasure Hunt	6: Data Collection 7: Data Analysis 8: Significant Energy Uses 9: Relevant Variables 10: Performance Indicators 11: Baselines, Objectives & Targets 12: Improvement Opportunities 13: Improvement Projects	6: Data Collection 7: Data Analysis 8: Significant Energy Uses 9: Relevant Variables 10: Performance Indicators 11: Baselines, Objectives & Targets 12: Improvement Opportunities 13: Improvement Projects

Unit 2 helps facility staff understand how the facility uses energy, how to identify improvement opportunities, how to prioritize and plan improvement projects, and how to measure energy performance. The goal of this unit is to identify, prioritize and implement projects that save energy and to set up the system for tracking energy performance. This unit closely follows the eight tasks of the Energy Review Section in the 50001 Ready Navigator.

Workshop #2, which typically lasts 8 hours, expands on the data collection planning efforts introduced in Unit 1 and introduces facility staff to the basics of collecting and analyzing their baseline data to understand how their facility uses energy. It also introduces them to the basics of finding improvement opportunities and of prioritizing and planning improvement projects so facility staff can begin to save energy. During this workshop, participants will begin to work on:

1. Task 6: Identifying all energy sources and collecting energy consumption data
2. Task 7: Analyzing energy consumption data at the system/equipment level
3. Task 8: Determining Significant Energy Uses and determined their energy performance
4. Task 9: Determining the relevant variables that affect energy consumption and collect data
5. Task 10: Identifying Energy Performance Indicators
6. Task 11: Establishing an energy baseline, objectives, and energy performance improvement targets
7. Task 12: Identifying and prioritizing energy performance improvements
8. Task 13: Developing action plans to implement energy improvement projects

The **Energy Footprint⁴** activity, which takes place after the workshop, supports facility staff in using the DOE Energy Footprint Tool to track energy consumption, factors related to energy use, and significant energy end-uses. This activity is led by the participant and supported by program staff.

The **Treasure Hunt⁵** activity, which takes place after the Energy Footprint activity, is an in-plant event whose goal is to identify improvement opportunities throughout the facility and to prioritize and plan improvement projects. Typically, this activity is co-managed by program staff and participant staff, takes one full-day, and requires technical program staff that can help identify and prioritize capital, process, operations and maintenance improvements.

⁴ The Energy Footprint activity should be based on the DOE Energy Footprint Tool or similar resource. The tool is available at <https://energy.gov/eere/amo/downloads/energy-footprint-tool>

⁵ The Treasure Hunt activity should be based on the EPA's ENERGY STAR Treasure Hunt or a similar resource. The Treasure Hunt Guide is available at <https://www.energystar.gov/buildings/tools-and-resources/energy-star-treasure-hunt-guide-simple-steps-finding-energy-savings>

2.3 Unit 3: Continual Improvement

	Workshops	Site-Specific Activities	Navigator Tasks Covered	Navigator Tasks Completed
Unit 3 Continual Improvement <i>months 7-10</i>	Workshop #3	Energy Performance Operational Controls	14: Monitoring 15: Measurement 16: Operational Controls 17: Corrective Actions 18: Energy Consideration in Design 24: Calculate Energy Savings	14: Monitoring 15: Measurement 16: Operational Controls 17: Corrective Actions 18: Energy Consideration in Design

Unit #3 helps facility staff reflect on their Energy Management System and plan how to set up controls that will allow both the system and the facility’s energy performance to continuously improve. The goal of this unit is to create a systematic approach to monitor and measure key metrics of the system and respond to any potential issues. This unit closely follows the five tasks of the Continual Improvement Section in the 50001 Ready Navigator.

Workshop #3 typically lasts 6-8 hours and gives facility staff the opportunity to understand and begin work on continuously improving their Energy Management System, which includes:

1. Task 14: Developing a plan for the ongoing monitoring and analysis of key performance metrics
2. Task 15: Ensuring energy monitoring and measurement activities are accurate and repeatable
3. Task 16: Setting, communicating, and implementing operations and maintenance criteria for Significant Energy Uses
4. Task 17: Investigating and responding to significant deviations in energy performance or in the performance of the Energy Management System
5. Task 18: Considering energy performance opportunities when designing new, modified, or renovated facilities, equipment, systems, and processes
6. Task 24: Demonstrating an improvement in energy performance at the facility

The **Energy Performance** activity⁶, which takes place after the workshop, allows program staff and facility staff to review the results of the energy savings calculation together to ensure the calculations are accurate. Program staff typically lead this activity.

The **Operational Controls** activity, which takes place after the workshop, helps the facility staff review where operational controls might be necessary, and to devise and implement strategies for creating operational controls for their most significant energy uses (SEUs). The facility staff typically lead this activity with support from program staff.

⁶ The Energy Savings Calculation Review activity should be based on the DOE ENPI Lite tool, available at <https://enpi.industrialenergytools.com>, the DOE Energy Performance Indicator tool, available at <https://energy.gov/eere/amo/articles/energy-performance-indicator-tool> or a similar resource.

2.4 Unit 4: System Management

	Workshops	Site-Specific Activities	Navigator Tasks Covered	Navigator Tasks Completed
Unit 4 System Management <i>months 11-14</i>	Workshop #4	Communication Training Management Review Savings Calculation Review	19: Documentation and Records 20: Communications 21: Training 22: Procurement 23: Internal Audit 24: Calculate Energy Savings 25: Management Review	19: Documentation and Records 20: Communications 21: Training 22: Procurement 23: Internal Audit 24: Calculate Energy Savings 25: Management Review

Unit 4 provides strategies and tactics for managing the Energy Management System. The goal of this unit is to ensure facility staff at all levels, including top management, have access to the documents, information and training necessary to ensure the Energy Management System is effective. This unit closely follows the seven tasks of the System Management Section in the 50001 Ready Navigator.

Workshop #4 typically lasts 6 to 8 hours and introduces key concepts for managing the Energy Management System. During this workshop, facility staff are given the opportunity to begin documenting how they will be:

1. Task 19: Developing processes to control documents and records
2. Task 20: Informing all organizational personnel about the energy policy and their roles and responsibilities
3. Task 21: Identifying training needs for key staff and contractors
4. Task 22: Establishing performance criteria for purchases affecting energy performance
5. Task 23: Conducting internal audits
6. Task 25: Holding periodic review of the Energy Management System with top management

The **Communication and Training** activities, which take place after the workshop, support the participants in finalizing and implementing the communication and training plans developed during the workshop. Typically, the facility staff lead this activity with program staff support.

The **Management Review** activity helps facility staff prepare and deliver a review of the Energy Management System to their top management. Facility staff typically lead this activity with program staff support.

The **Savings Calculation Review** activity, which takes place late in the unit to allow for the collection of a full year of data, gives facility staff and program staff the opportunity to review energy savings assumptions, data, and calculations to ensure energy savings for the first year are accurate.

2.5 Unit #5: Review of Planning and Energy Review Sections

	Workshops	Site-Specific Activities	Navigator Tasks Covered	Navigator Tasks Completed
Unit 5 Review of Planning and Energy Review Sections <i>months 15-18</i>	Workshop #5: Online	Navigator Review Treasure Hunt	Tasks 1 to 13	

Unit 5 gives facility staff a chance to review and improve on their initial work on the initial two units (Planning and Energy Review) and helps them create an action plan to complete any outstanding tasks. In addition, this unit helps facility staff further identify energy improvement opportunities.

The **Navigator Review** activity, which takes place before the workshop, helps facility staff review and track their Energy Management System progress on all tasks using the 50001 Ready Navigator, helps ensure that facility staff are using Navigator appropriately, and helps facility staff create a plan for completing tasks. The program staff typically lead this activity.

Workshop #5, which typically lasts 3 to 4 hours and takes place online, helps facility staff share their progress and allows them to share any issues they have encountered through the program and their plans for completing any outstanding tasks with peers. In addition, at this workshop program staff will introduce what the second year treasure hunt will be looking for and the general results of the Navigator review. This workshop can be held using a webinar.

The **Treasure Hunt** activity, which is held at the facility and lead jointly by program staff and facility staff, guides facility staff in identifying and prioritizing improvement opportunities, focusing on opportunities that may not have been found in the Treasure Hunt completed in Unit 2.

2.6 Unit 6: Review of Continual Improvement and System Management Sections

	Workshops	Site-Specific Activities	Navigator Tasks Covered	Navigator Tasks Completed
Unit 6 Review of Continual Improvement and System Management Sections <i>months 19-23</i>	Workshop #6: Online	Energy Savings Review Internal Audit Management Review	Tasks 14 to 25	

Unit 6 gives facility staff a chance to review and improve on their initial work on Unit 3 and Unit 4 (Continual Improvement and System Management). In addition, this unit provides support to complete a formal internal review of the management system. The goal of this unit is to complete all 50001 Ready tasks.

The **Energy Savings Review** activity, which is typically led by facility staff, is held before the workshop and helps facility staff and program staff review assumptions made in calculating Year 1 savings to ensure they are valid in Year 2. In addition, mid-year energy saving estimates are made for year 2.

Workshop #6, which typically lasts 3 to 4 hours and takes place online, helps facility staff share their progress and allows them to share issues encountered and plans for completing outstanding issues related with tasks 14 to 25 with peers. In addition, program staff will discuss key concepts about the internal audit activity and will discuss timing on the management review and will provide a general overview of the results of the Energy Savings Reviews. This workshop will be held using a webinar.

The **Internal Audit** activity, which should take place after the workshop, helps facility staff prepare for and implement a review of the effectiveness of their Energy Management System and prepare a report for their top management. Facility staff should lead this effort with program staff support.

The **Management Review** activity helps facility staff prepare and deliver a review of the Energy Management System to their top management. Facility staff typically lead this activity with program staff support.

2.7 Unit 7: Celebration and Next Steps

	Workshops	Site-Specific Activities	Navigator Tasks Covered
Unit 7 Celebration and Next Steps <i>month 24 and 25</i>	Workshop #7: Celebration	Planning for Next Steps Presentation Development Energy Savings Review	<i>None</i>

Unit 7 helps facility staff share their accomplishments and generate enthusiasm for continuing work on the Energy Management System. This unit provides a forum for their peers and managers to recognize the work that has been done and hear their plans for the future.

The **Planning for Next Steps** activity should take place before the workshop and is done to help both the facility staff and program staff understand their role and actions after the program engagement period ends, as well as options for recognition from US DOE for completion of the 25 Navigator tasks.

The **Presentation Development** activity also takes place before the workshop and is led by facility staff, helping them prepare their presentation for Workshop #7.

At **Workshop #7**, which typically lasts 4 to 6 hours, facility staff provide a brief presentation, to both their facility's manager and to the other facility staff, explaining their experience going through the program, key achievements, and possible next steps.

APPENDIX A: 50001 READY NAVIGATOR TASKS

The 50001 Ready Navigator is an online guide for establishing an energy management system to plan, identify, prioritize, and implement projects that will improve your facility’s energy performance. Completion of the 50001 Ready Navigator prepares facilities to pursue certification to the international best practice for energy management systems, ISO 50001.

Building on the structure of ISO 50001, the US Department of Energy has outlined 25 tasks with supporting guidance that your team will need to complete in order to implement a **50001 Ready** Energy Management System.

The 25 tasks are grouped into four sections:

- Planning (tasks 1-5)
- Energy Review (tasks 6-13)
- Continual Improvement (tasks 14-18)
- System Management (tasks 19-25)

The following is a complete list of all 50001 Ready Navigator Tasks.

Section 1: Planning		
Task 1	Scope and Boundaries	We have defined, documented and approved the Scope and Boundaries of our 50001 Ready energy management system
Task 2	Energy Policy	We have developed an energy policy statement, which has been approved by top management
Task 3	Management Commitment	Our top management has expressed its commitment to the 50001 Ready system, and are aware of their roles and responsibilities
Task 4	Energy Team	We have established an energy team that meets regularly and includes a management representative. Roles and responsibilities have been defined for the energy team and all affected personnel.
Task 5	Legal Requirements	We have identified energy-related legal requirements that apply to our operations, have a process to evaluate and update these over time, and evaluated our compliance with them
Section 2: Energy Review		
Task 6	Data Collection	We have identified all our energy sources and uses and accurately collected the related energy consumption data

Task 7	Data Analysis	We have analyzed our energy consumption data at the system/equipment level
Task 8	Significant Energy Uses (SEUs)	We have determined our Significant Energy Uses (SEUs) and determined their energy performance, estimated future consumption and have a plan for reviewing and updating them.
Task 9	Relevant Variables	We have determined the relevant variables that affect energy consumption of each SEU and collected the associated data.
Task 10	Performance Indicators (EnPIs)	We have identified energy performance indicators (EnPIs) and developed a methodology for determining and updating them.
Task 11	Baselines, Objectives and Targets	We have established an energy baseline(s), approved objectives and energy performance improvement targets, and timeframes for their achievement
Task 12	Improvement Opportunities	We have identified and prioritized energy performance improvement opportunities, and have a process in place to continue to update them
Task 13	Improvement Projects	After using a documented project selection process, we have developed action plans and implemented energy improvement projects
Section 3: Continual Improvement		
Task 14	Monitoring	We have ongoing monitoring and analysis of our energy consumption, SEUs, relevant variables, and action plan progress and effectiveness
Task 15	Measurement	We have an energy measurement plan, reviewed periodically, which defines, organizes and documents our monitoring and measurement activities, and ensures they are accurate and repeatable.
Task 16	Operational Controls	We have set operations and maintenance criteria for our SEUs, operate them accordingly, and communicate these controls to relevant personnel
Task 17	Corrective Actions	We investigate and respond to significant deviations in energy performance and potential issues with the 50001 Ready system, taking corrective and preventative actions as needed

Task 18	Energy Consideration in Design	We consider energy performance opportunities when designing new, modified, or renovated facilities, equipment, systems and processes
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Section 4: System Management

Task 19	Documentation and Records	We have developed and have processes in place to control the 50001 Ready systems documents and records
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Task 20	Communications	All organizational personnel have been informed about our energy policy and their roles and responsibilities, and solicited for suggestions. We have determined the policy and method (if applicable) for external communications about our energy policy/performance.
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Task 21	Training	Training needs for the 50001 Ready system and the SEUs have been identified, and staff and contractors have been trained as needed to ensure they are qualified for their energy management role
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Task 22	Procurement	We have established energy performance criteria spanning the operating life for purchases affecting energy performance, informed suppliers that this is a factor in procurement, and have defined and currently use specifications for energy supply purchases
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Task 23	Internal Audit	We have conducted internal audits of the 50001 Ready system and reported those results and corresponding corrective/preventive action items to top management
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Task 24	Calculate Energy Savings	We have determined our energy performance improvement.
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Task 25	Management Review	Top management has periodic reviews of the 50001 Ready energy management system and our organization's energy performance.
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