

Strategic Energy Management: Meeting the Measurement Challenge

Our live webinar will start shortly.

You should be hearing background music. If you don't, please type in the chat.



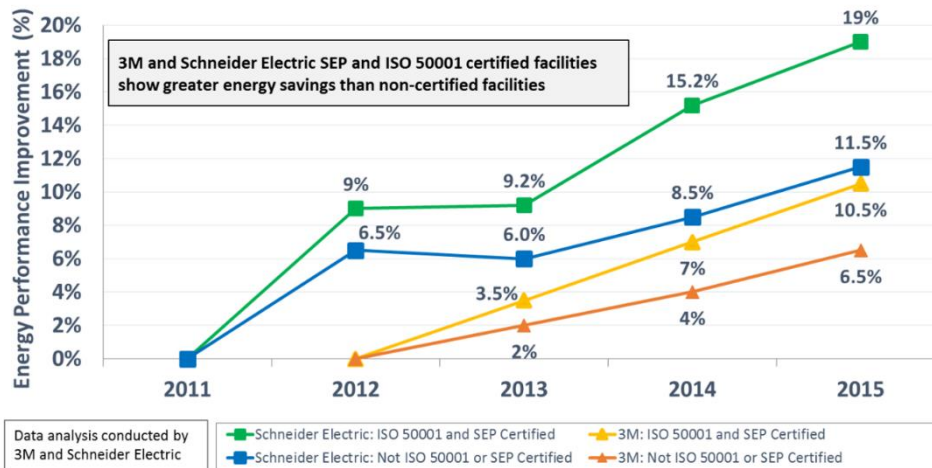
50001 Ready Program

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ISO 50001 – Energy Management Systems Standard



- **ISO 50001 is an EnMS (Energy Management System)**
 - Culture. Change management process engaging facility/plant personnel with management/leadership
 - Practice. Based on the Plan-Do-Check-Act (PDCA) cycle promotes continuous improvement
 - Process. Similar to quality (ISO 9001) and environmental (ISO 14001) management system standards
- **Key Components**
 - Commitment. Leadership committed and empowering energy management
 - Data. Collection and analysis of energy performance in facility and large energy users
 - Value. Incorporating energy decisions into overall operations



Companies adopting ISO 50001

- 3M
- Aflac
- American Axle & Manufacturing
- BAE Systems
- BMW
- Bosch Rexroth
- Bridgestone
- Cargill
- Chrysler
- Coca-Cola
- Cummins
- Curtiss-Wright EMD
- Detroit Diesel
- Google
- HARBEC Inc.
- Hilton Worldwide
- IBM
- Intertape Polymer Group
- Land O'Lakes
- Johnson Controls
- Mack Trucks
- Marriott International, Inc.
- MedImmune
- NewGold
- Nissan North America
- Samsung
- Schneider Electric
- Titan America
- Volkswagen
- Volvo

Current Status of DOE ISO 50001 Programs



- Conformance to ISO 50001
- Launched in May 2017
- 3 facilities recognized
- 75+ facilities currently underway in Navigator
- Translations in Spanish and French underway



- Verified Performance of SO 50001 Certification
- SEP 2012 and SEP 2017 available
- 49 SEP-certified sites
- 4 companies adoption SEP enterprise-wide across 30 facilities
- **SEP 2018 under development with stakeholder input**

50001 Ready: 3 Steps to Recognition



STEP 1

Start Implementation of ISO 50001 principles

Use the 50001 Ready Navigator Online Tool

- ✓ Turbo Tax like tool with 25 Tasks
- ✓ Self-attest to completion
- ✓ Online guidance, resources, videos (coming soon)

STEP 2

Analysis of energy reductions

Develop Energy Performance Data

- ✓ Show at least 1 year facility energy data (monthly data)
- ✓ Broken down by fuel type and total energy
- ✓ May use Portfolio Manager or other databasing tools

STEP 3

File for 50001 Ready recognition

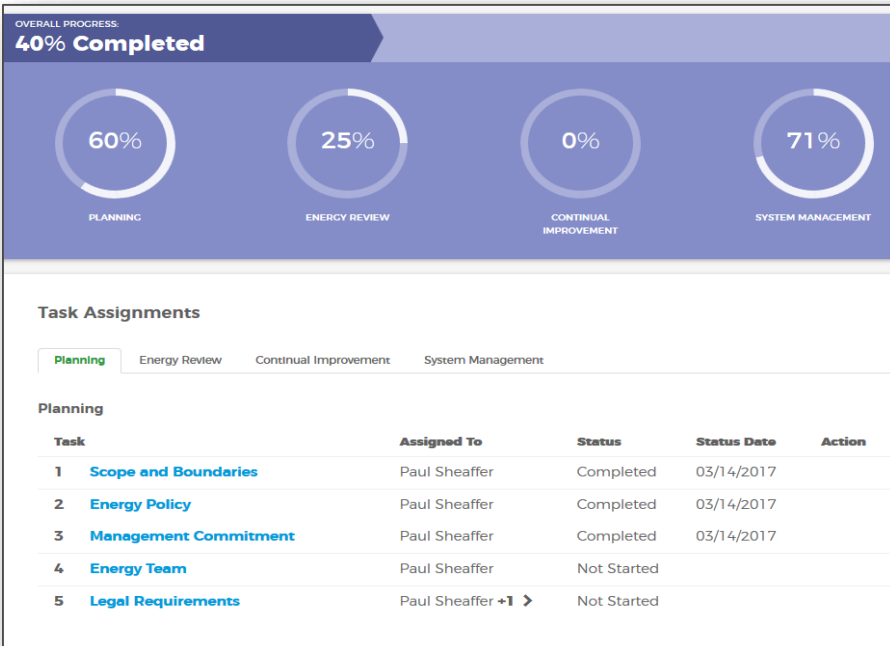
Submit information to DOE for Review

- ✓ Submit energy performance data (simple desk review)
- ✓ Attestation form signed by team leader and executive
- ✓ Follow-on quick interview by program admin



DOE recognizes
50001 Ready
achievement

50001 Ready Navigator



- ✓ Open Source 'Turbo Tax' online tool, with simple, step-by-step approach to ISO 50001
- ✓ 25 tasks divided into 4 sections
- ✓ Ability to build team and assign tasks to team members and leave notes in Tasks
- ✓ Designed to enter and track progress across multiple projects

Task 1: We have defined, documented and approved the Scope and Boundaries of our 50001 Ready energy management system

You are both a CONTRIBUTOR and the APPROVER on this task.

[Request Assistance](#) [Download](#)

Not Started x In Progress **Ready For Review** Q Completed v

Detailed Guidance: Scope and Boundaries

Getting It Done Task Overview Full Description Notes 0 Resources History Assignments

Getting It Done

- With management input, complete the [Scope and Boundaries Worksheet](#) to define the scope and boundaries of the energy management system (EnMS).
- Develop an EnMS Scope and Boundaries Statement.
- Have top management approve the Statement and communicate it across the organization.

Detailed Guidance: Scope and Boundaries

Getting It Done Task Overview Full Description Notes 0 Resources History Assignments

Enterprise-Level Tracking

Track facility-level performance across different locations.

The screenshot displays the '50001 Ready U.S. DEPARTMENT OF ENERGY Navigator' interface. The main content area is titled 'My Projects Overview' and includes a 'Hide Test Projects' button and two 'Create Project' buttons. Below this is a table with columns for Project Name, Task Progress, Status/Next Action, Last Activity, and Action. The table lists four projects: San Francisco facility, Berkeley Lab, Oakland office, and Building 90. Each project row includes a progress indicator (checkmark or 0%), a status button (e.g., 'Recognition Request Returned', 'Request DOE Recognition', 'Team Completing Tasks'), and a last activity date.

Project Name	Task Progress	Status/Next Action	Last Activity	Action
[test] San Francisco facility	✓	⚠ Recognition Request Returned	07/25/2017	⋮
[test] <small>Associated with:</small> Better Buildings Berkeley Lab	✓	📣 Request DOE Recognition	07/05/2017	⋮
[test] Oakland office	✓	📣 Request DOE Recognition	04/03/2017	⋮
[test] <small>Associated with:</small> FEMP Building 90	0%	⚙ Team Completing Tasks	04/03/2017	⋮

What “50001 Ready” Is and Is Not



50001 Ready Is Not...

A standalone DOE program

- 50001 Ready is designed to be branded & customized by the utility, state, etc.
- DOE willing to co-brand 50001 Ready recognition
- DOE is not ‘claiming’ savings

Designed to replace current Utility SEM programs or offerings

- 50001 Ready can be used to jump start into SEM or integrated into advanced SEM program
- Requires minimal effort to integrate with existing SEM programs

A certification program

- 50001 Ready builds infrastructure toward certification (if desired)
- Provides recognition for self-declared conformance to the principles of ISO 50001

50001 Ready Is...

A promoter of consistent energy management principles and energy performance improvement

- Provides guidance based on the ISO 50001 standard used across the globe
- Consistent output across sectors, geography, service territories

A program that does not require formal certification

- Self-declared performance to ready a facility for ISO 50001/SEP certification

A set of resources available for rebranding/repurposing

- The program and its tools may be ‘owned’ by service companies, utilities, states, and other implementer organizations.

The provider of user-friendly tools to establish an energy management system

- Should not require ‘certified’ professionals to implement; but may leverage existing program support staff or CP EnMS professionals



How does this fit with Corporate Enterprise or Utility/State/Local/Association Cohorts:

1. 50001 Ready is no cost, self-paced, non-certifying way to institute ISO 50001 in facilities around the world based on a global consistent standard
2. DOE has developed the online platform and resources
3. For limited time, DOE will provide free online 'Help Desk' resources to partners in the 50001 Ready Navigator
4. DOE happy to partner with organizations to take ownership of 50001 Ready
 - ✓ 50001 Ready Navigator is Open Source for adoption by other entities
 - ✓ Recognition from partner (or jointly with DOE)
 - ✓ Names of recognized facilities shared with DOE for posting
 - ✓ Sharing of media output with DOE (ability for cross-promotion)

50001 Ready Designee: Four Seasons Produce



- First US facility to receive recognition
- 266,000 square foot fruit and vegetable refrigerated warehouse
- Started project in May; recognized as 50001 Ready in June
 - 5 weeks engagement, approx 80 hours effort
- Drew from expertise from every department, including HR, accounting, packing, warehouse, and executive leadership
- “Great refresher” for reconfirming operations and lessons learned from utility Continuous Energy Improvement program
- Hope to use EnMS practices to improve ENERGY STAR score

50001 Ready Designee: Charter Steel



- Leveraged Better Plants participation to achieve recognition
- 900,000 square foot melting, rolling, and processing plant
- Found the Navigator to increase confidence in their EnMS implementation.
- The 50001 Ready EnMS has increased energy awareness at both upper and lower levels of the organization.
- Coordinated with environmental management software systems and communications methods to integrate with ISO 14001.

How Do I Get Started?



1. Go to ***energy.gov/50001Ready*** for more information (FAQs, etc)
2. If *Better Plants* Partner, speak to your TAM for additional support from DOE
3. Review the **50001 Ready Navigator** (with or without registering)
4. **Sign-up** in the 50001 Ready Navigator (DOE happy to assist)
5. Empower your Energy Team and **Watch Success Unfold**

DOE has found that if energy is a corporate priority, your facility is well on your way to being 50001 Ready!

Contact Pete.Langlois@ee.doe.gov or Jay.Wrobel@ee.doe.gov to get started

October 5th, 2017

SEM Infrastructure

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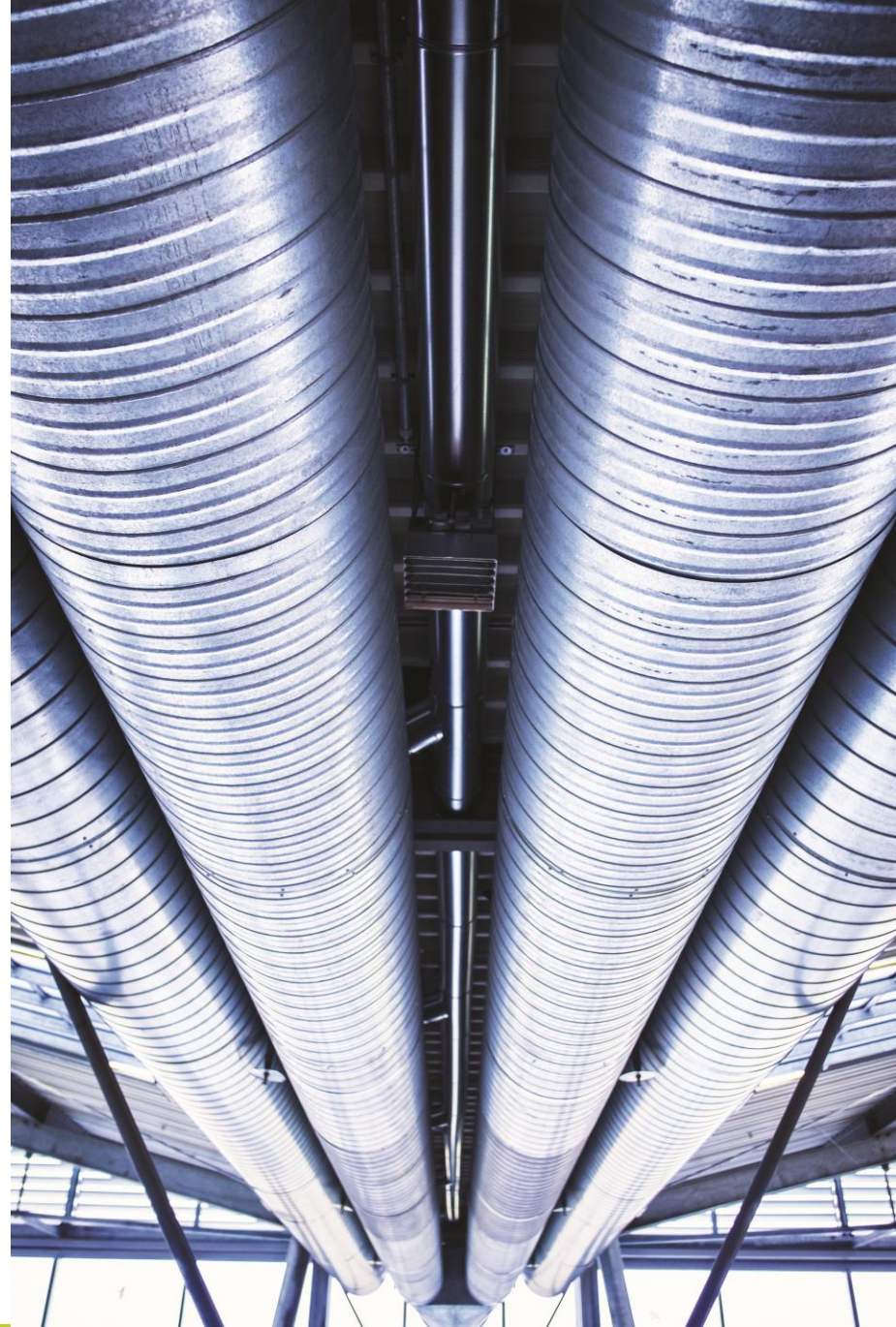
NEEA's role

- Convene an active community of SEM practitioners and deepen their capabilities by teaming up to tackle shared challenges
- Gather and vet all available SEM tools and resources and offer them in a single, accessible location



The Need

- A common language and terminology for SEM in the region.
- Information on SEM best practices available in a centralized, accessible, and trustworthy location.
- Expertly vetted resources for current practitioners and those who are interested in learning more.



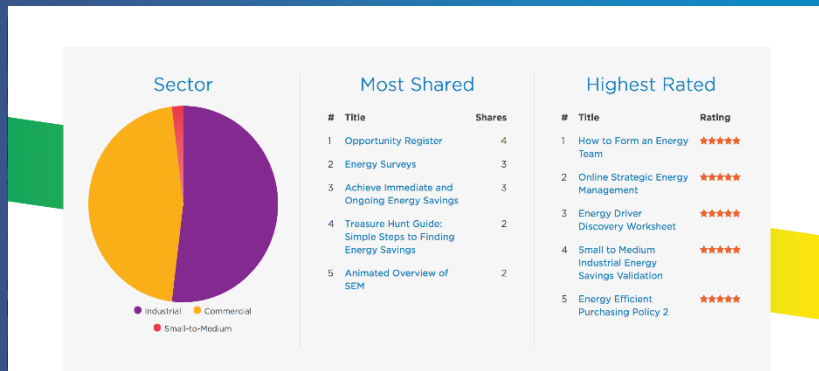


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Learn more at: SEMHUB.com



TOGETHER We Are Transforming the Northwest



Commercial SEM Measurement Implementation Challenges

AESP – SEM Meeting the Measurement Challenge

October 5, 2017

Jim Volkman, P.E. Principal Strategic Energy Group



**Portfolios characteristic of
commercial SEM**

Multi-year engagements

Challenges

1

Cost

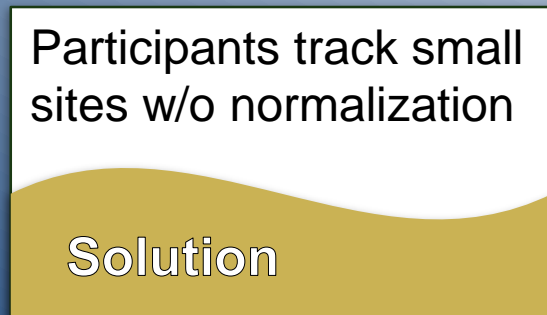
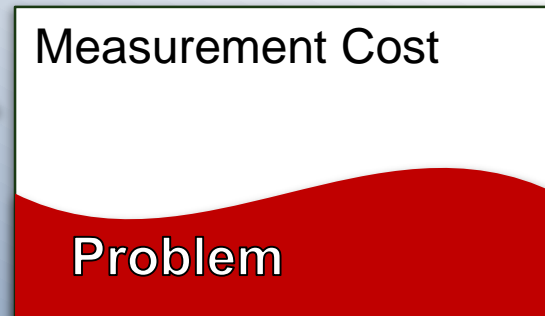
2

Negative Savings

3

Evolving Baselines

Measurement Cost

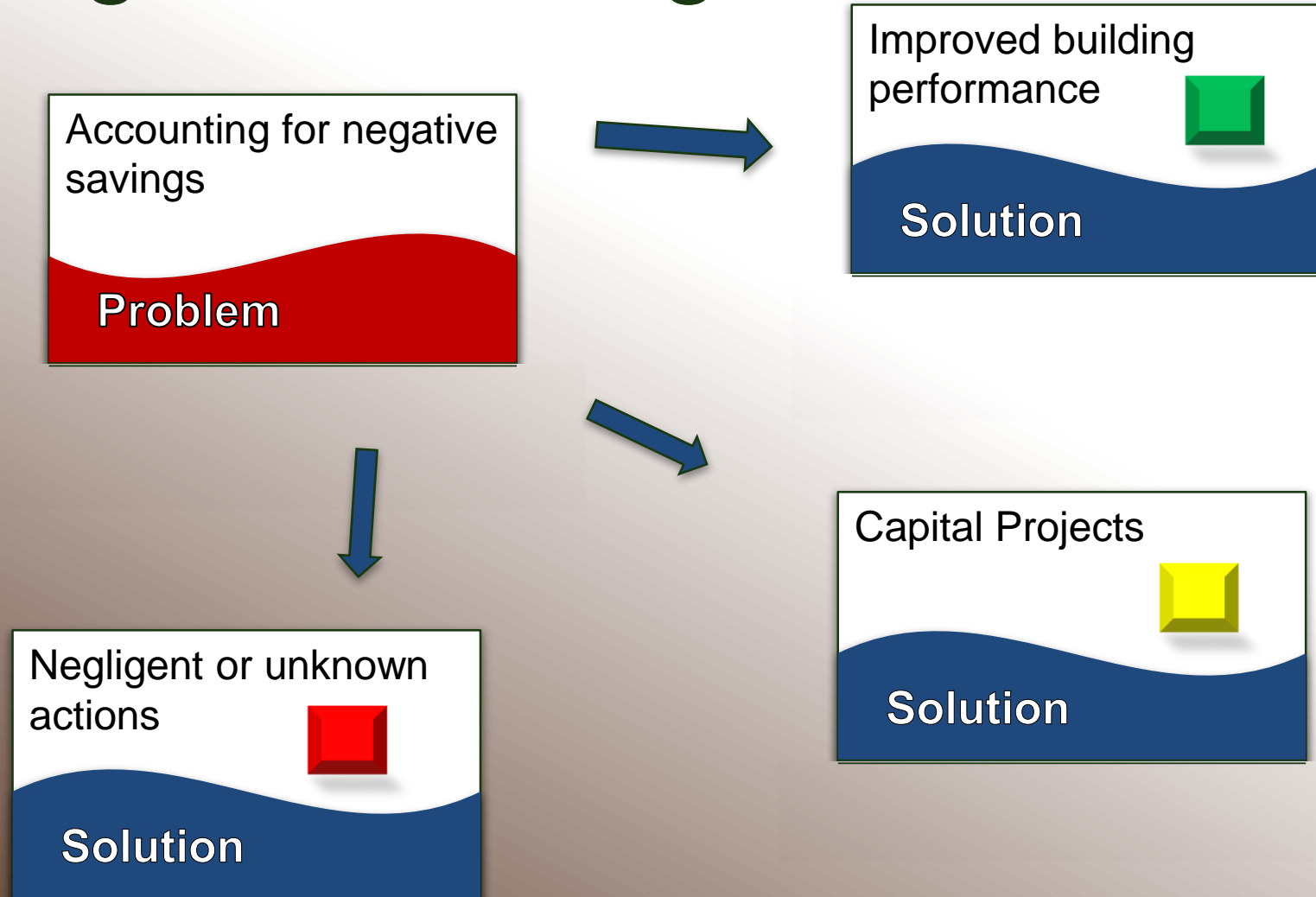


Cause of Negative Savings

1. Capital Project Performance
2. Negligence
3. Improved Operating Performance
4. Unknown



Negative Savings





Energy Retrofits

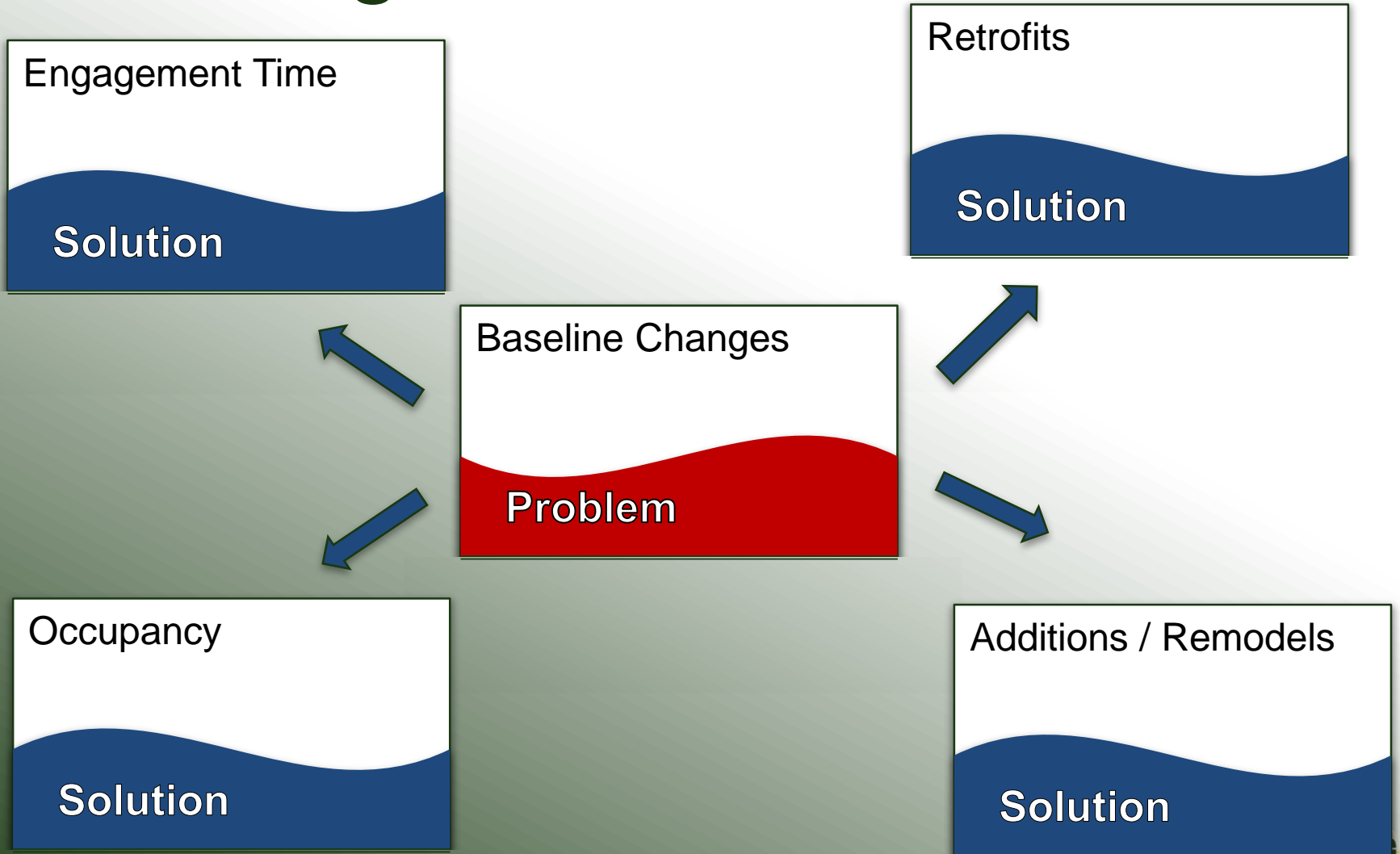
Occupancy Change

Major Additions

Remodels

Time in Program

Evolving Baselines





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STRATEGIC ENERGY GROUP 

The logo consists of a blue rectangular box with the word "CADMUS" written in white, uppercase, sans-serif font.

CADMUS

A yellow horizontal bar with a white arrow pointing to the right, positioned to the left of the title.

Uniform Methods Project SEM Evaluation Protocol

Jim Stewart, Ph.D.

October 5, 2017



SEM Evaluation Protocol

- UMP SEM Evaluation Protocol published in May 2017
- Goal: to provide guidance about best practices for estimating savings for utility SEM programs
- Development process
 - Technical Experts and Advisory Group
 - Public comment



Chapter 24: Strategic Energy Management (SEM) Evaluation Protocol

The Uniform Methods Project: Methods for Determining Energy Efficiency Savings for Specific Measures

Created as part of subcontract with period of performance July 2016 – April 2018

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NREL Technical Monitor: Charles Kurnik

NREL is a national laboratory of the U.S. Department of Energy
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Subcontract Report
NREL/SR-7A40-68316
May 2017

Contract No. DE-AC36-08GO28308



Measure Description

- Strategic Energy Management (SEM)
 - Seeks continuous improvements in energy efficiency through systematic and planned changes in facility operations, maintenance, behaviors, and capital upgrades
 - Energy Management Systems (EnMS)
 1. Establish management support, policy, and goals
 2. Identify and implement savings opportunities
 3. Track progress
 4. Update goals and plans
 - CEE Definition and Minimum Elements



Application Conditions of Protocol

- Estimating energy savings from SEM is the objective
- Facility-level data for the baseline and reporting periods are available
- It is possible to construct a valid facility energy consumption model
- Expected impacts are sufficiently large to be detected statistically



Recommended Evaluation Approach

- Determine whether energy savings can be detected statistically
- Collect facility data on energy consumption and drivers (output, occupancy, weather)
 - Full year of baseline data recommended
- Estimate savings for individual facilities
- Use multivariate regression analysis to adjust baseline consumption
 - Adjust for changes in output, occupancy, and weather between baseline and reporting periods



SEM Evaluation Protocol Topics

Measure Description

Applicability Conditions

Savings Calculations

- Research design (facility boundaries, on-site energy uses)
- Data collection and preparation
- Definition of baseline and reporting periods
- Model specification
- Fitting the model
- Estimating and documenting savings

(Topics, cont.)

Measurement and Verification Methods

- Regression methods for estimating savings
 - Forecast models
 - Pre-post models
 - Normalized operating conditions models
 - Backcast models
 - Panel methods
- Non-routine adjustments



Thank you!

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Questions?

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