

#### Strategic Energy Management (SEM) with ISO 50001 and 50001 Ready

ORNL 50001 Ready Training Webinar Series, Session 6 March 16, 2021 10:00 a.m. to 12:30 p.m.





## Agenda – Session SIX

- Welcome, Safety, and Housekeeping
- Review Previous Sessions
- Today's Content: <u>Evaluating Performance</u> <u>PERFORMANCE EVALUATION, Section 6:</u>
  - Task 20 Monitoring and Measuring of the EnMS
  - Task 21 Monitoring and Measuring of Energy Performance Improvement
- Webinar Training Schedule & Preparations
- Kahoot Quiz Game







Better Buildings is an initiative of the U.S. Department of Energy





- Based on your organization's corporate goals, where does your company stand with regards to carbon footprint?
  - A. We have specific carbon reduction goals in our energy policy and plans. This is very important to us.
  - B. Our energy policy and energy saving projects are based on reducing our carbon footprint.
  - C. We want to improve our carbon footprint, but this is not yet incorporated into our energy policy or plans
  - D. We have not considered our carbon footprint
  - E. We plan to produce all heat, hot water, steam, etc., by burning coal!



U.S. DEPARTMEN







- Welcome to the Virtual INPLT <u>50001 Ready</u> webinar training series
- Eight, 2-1/2 hour webinars, focused on Strategic Energy Management (SEM), in general, and the ISO 50001 standard and <u>50001 Ready Navigator</u>, in particular
- The webinars will help you understand the why and how of SEM and the <u>50001 Ready Navigator</u> tool
- Thank you for your interest!









## Safety and Housekeeping

Please make sure that your surroundings are safe:

- $\circ~$  If you are driving, please use hands free mode
- $\circ~$  If you are in a building, be sure you know the exit paths
- $\circ~$  If you are at home, be sure there are no distractions
- You are welcome to ask questions at any time during the webinar
- When you are not asking a question, please <u>MUTE</u> your mic and this will provide the best sound quality for all participants
- We will be recording all these webinars and by staying on-line and attending the meeting you are giving your consent to be recorded
  - $\circ~$  A link to the recorded webinars will be provided, afterwards







Our Team for this 50001 Ready Training







Better

Plants

ENT OF ENERGY

## Our 50001 Ready Training Group

- Information on our 50001 Ready Training Group:
  - $_{\odot}\,$  26 different organizations, many with multiple sites
  - $\circ\,$  Many with global footprints
  - Size of sites range from 100,000 square feet up to 586 acres
  - A wide range of products and markets: -
  - Primary Energy types:
    - Electricity
    - Natural Gas
    - Liquid Propane
    - Diesel and other Fuel Oils
    - Some solar, some biogas, and some CHP



**Energy Consulting** Cheese & Whey Plastics Composites Chemicals Automotive vehicles Automotive batteries Automotive fuel systems **Electronics** Fiberglass **Flooring materials Organic foods** Packaging Glass Craft beers City government Wastewater treatment Industrial machinery Shrimp peeling equipment **Filtration media** Tape Medical



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## **Review of Previous Sessions**

- Review the homework from Session FIVE
- Quick List of Acronyms
- The 50001 Ready navigator
- Session 2 5, Review: Tasks 1 19
  - Laying the Foundation
  - Where Does all my Energy Go?
  - Sorting out the Energy Data
  - Engaging Other Functions









## Quick List of Acronyms

- SEM = Strategic Energy Management
- EnMS = Energy Management System
- SEU = Significant Energy Use
- EnPI = Energy Performance Indicator
- EnB= Energy Baseline
- PDCA = Plan, Do, Check, Act





## Why 50001?: A System

#### Navigator

LANGUAGE English V Log In



#### Welcome to the 50001 Ready Navigator!

The 50001 Ready Navigator is an online application that provides step-by-step guidance for implementing and maintaining an energy management system in conformance with the ISO 50001 Energy Management System Standard. Join the 23,000+ sites worldwide benefiting from an energy management system!

The 50001 Ready Navigator has been updated to reflect the changes made to the ISO 50001 standard in 2018. The original version of the 50001 Ready Navigator, based upon the 2011 publication of ISO 50001, will be available online for one year and accessible by existing projects to allow for a seamless transition to the revised version. Information about the full transition from the current to updated 50001 Ready Navigator is available below.



#### 50001 Ready Navigator ISO 50001:2018 Update

The 50001 Ready Navigator's structure and tasks have been updated to align with ISO 50001:2018. Documentation of this can be found here: Navigator crosswalk

#### FREE

- Download ONLY, one way information flow
- None of your site info is uploaded
- Single site or multi-site capability





## 50001 Ready: Review Previous Tasks

Better Plants





## Tasks 1-19: The Big Picture

 Building the <u>energy success pyramid</u> starts with a wide base of small actions that build to the completion of energy policy







#### Today's Content

# Tasks 20 - 21



## 50001 Ready Navigator: Today's Tasks

Better Plants





## Performance Evaluation (4 tasks)

# <u>CHECK</u> on how you are doing for <u>both</u> your EnMS and your energy performance improvement



Are you effectively monitoring and measuring your EnMS and your energy performance improvement? How are your tracking systems working? Are internal audits and management reviews all set up? [Session 7]







## Performance Evaluation: The Big Picture







- Task 20: We monitor trends in energy management system (EnMS) performance and evaluate the effectiveness of the EnMS in achieving intended outcomes and planned results.
- The methods used, the frequency of the monitoring, and when the results are analyzed and evaluated are defined.







### Task 20: Key Terms

#### Monitoring: Passive, periodic, or intermittent

- Monthly utility bills
- **Compliance**
- UWeather data
- □ Natural gas commodity pricing

#### Measurement: Active, point reading, recorded

- □ Stack analyzer readings
- Chilled water supply temperature
- Boiler pressure
- Electric sub-meter on a chiller plant
- Analysis: Make use of the data





#### Task 20: Key Actions

#### What data and information is needed?

□ To establish trends

□ To evaluate the results of the EnMS

□ To evaluate the effectiveness of the EnMS

□ To determine if your EnMS is meeting your goals

#### How will you do this?

□ Methods, systems, measuring equipment

□ Spreadsheets, programs, analytics

How do you ensure valid results

#### When will you do this?

Collect info daily, weekly, monthly, annually, other

□ How often is info analyzed and evaluated







#### Task 20: Connecting the Dots Between Tasks







#### Task 20: Base Measurement on Goals

#### How do we keep tabs on our smallest scale goals?







#### Task 20: Track Measurements to Monitor Trends



Plotting and trending systematic results is a GREAT method for evaluating the operations of your EnMS.



- 2) Based on your current monitoring and measuring, do you make use of graphing and trending?
  - A. We understand and make excellent use of graphing and trending to evaluate system performance
  - B. We understand the value and make some use of graphing and trending
  - C. We have some understanding of graphing and trending and would like to use this more
  - D. We are not sure how to make the best use of trending and graphing
  - E. "If it's somethin' weird, and it don't look good. Who ya gonna call?!"







#### Task 20: Playbook

- Look at Task 20 in 50001 Ready
- Look at the Task 20 Playbook



#### **50001 Ready** 50001 Ready Navigator Playbook U.S. DEPARTMENT OF ENERG Task 20: Monitoring and Measurement of the EnMS Date last modified/updated: Internal audit: Click here to enter a date. Who last modified/updated: Management review: Click here to enter a date This part of the Navigator Playbook is completed when you have: 1. Determined what data or information is needed to establish trends in EnMS performance, including trends in nonconformities, corrective actions, and results in monitoring and measurement, internal and external audits, and evaluations of compliance with applicable energy-related legal and other requirements. 2. Determined what data or information is needed to monitor, measure, analyze and evaluate the results of the EnMS and its effectiveness as related to the intended outcomes of your EnMS and the strategic goals and priorities of your organization. 3. Determined the methods to be used, when the monitoring and measurement will be done, and when the results will be analyzed and evaluated. 4. Implemented the monitoring, measurement analysis of EnMS performance and the evaluation of EnMS effectiveness.





## Task 21: Monitoring & Measuring of Energy Performance Improvement

Task 21: We monitor and measure the key characteristics (i.e. EnPIs) of processes that affect our energy performance. We define:

the methods used

- the frequency of the monitoring and measurement, and
- when the results are analyzed and evaluated.

We <u>evaluate our energy performance improvement</u> and investigate and respond to <u>significant deviations</u> in energy performance.





### Task 21: Questions to Ask

- What do you need to monitor and measure for determining energy performance? Use input from:
  - The energy review
  - Energy data collection plans
  - The operations of Significant Energy Users (SEUs)
  - Selected EnPIs and EnBs
  - Actual versus expected energy consumption
- When will monitoring and measuring be performed?
- How do you evaluate energy performance?
- What methods will you use to determine energy performance improvement (i.e. EnPIs compared to EnBs)?
- Have you defined criteria for significant deviations in energy performance?



#### Task 21: Connecting the Dots Between Tasks







### Task 21: Key Term

- Significant deviation:
  - "The organization shall investigate and respond to <u>significant deviations</u> in energy performance." (ISO 50001: 2018, 9.1.1)
  - When to respond and how to respond will be determined and appropriate personnel will be trained
  - Maintain records of the results of the responses and investigations into significant deviations



Your energy team defines what amount of deviation becomes significant







## Task 21: Investigating Deviations

## Assess and document:

What happened?





# How do we prevent this from happening again in the future?





## Task 21: More Key Terms

- Relevant Variables
  - Impacts energy performance, i.e., relevant
  - Typically changes, i.e., variable



- Examples: weather conditions (heating degree days, cooling degree days, average outside temperature, humidity, working hours, occupancy, production output, etc.)
- Normalization
  - Allows for comparison of apples to apples
  - Accounts for changes so that you can properly compare energy performance to energy baselines





## Polling Question 3

- 3) Based on your current monitoring and measuring, do you track and use relevant variables to normalize your energy data?
  - A. We understand and make excellent use of relevant variables to evaluate our energy performance improvement
  - B. We understand the value and make some use of relevant variables
  - C. We have some understanding of relevant variables and would like to make more use of these
  - D. We are not sure how to make the best use of relevant variables
  - E. We do not think that we have any relevant variables
  - F. "Variable, this is Knife, over. Variable, this is Knife, over! Variable I am not receiving!"





### Task 21: Energy Metrics – Complexity Levels







#### Task 21: Energy Intensity Metric - Ratio







#### Task 21: Linear Regression Model







#### Task 21: Playbook

- Look at Task 21 in 50001 Ready
- Look at the Task 21 Playbook



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Activity

- 4) Thinking about Tasks 20-21:
  - Task 20: Monitoring and Measuring of the EnMS Task 21 - Monitoring and Measuring of Energy Performance Improvement Where do you feel your organization is relative to these two tasks?
  - A. We essentially already have all of this in place. Just a little tweaking is needed.
  - B. These make sense and my organization has some of this in place. It would not take too much effort to complete these.
  - C. Most of this is new to my organization, but we do have some basics in place. It would take some effort to get this in place.
  - D. I would basically have to start from scratch to get these tasks completed.
  - E. "I knew I should've taken that left turn at Albuquerque!"









#### Review and Wrap Up

### Webinar Training Schedule & Preparations Kahoot Quiz Game Q&A



### 50001 Ready Navigator Tasks: Webinar #5, and then #6







### Performance Evaluation (4 tasks)

# <u>CHECK</u> on how you are doing for <u>both</u> your EnMS and your energy performance improvement



Are you effectively monitoring and measuring your EnMS and your energy performance improvement? How are your tracking systems working? Are internal audits and management reviews all set up? [Session 7]







# When we <u>check</u>, if things are not okay, then we <u>ACT</u> to fix them, and we do this in an ongoing method





Do you have a strong corrective action program to fix and follow up on nonconformities to your EnMS? Do you continually improve both your EnMS and your energy performance? [Session 7]





#### Training Schedule: By Session

- 1. An Introduction and Overview DONE February 9
- 2. Laying the Foundation of 50001 DONE February 16
- 3. Where does all the Energy Go? DONE February 23
- 4. Sorting out the Energy Data DONE March 2
- 5. Engaging Other Functions DONE March 9
- 6. <u>Evaluating Performance</u> <u>TODAY</u> March 16
- 7. Ensuring Continual Performance Improvement <u>NEXT</u>
  a) March 16, 10:00 a.m. to 12:30 p.m.
- 8. Wrap Up and Next Steps March 30





### **Preparation for Session SEVEN**

- If desired, purchase the ISO 50001: 2018 standard
- Set up, use, and maintain your 50001 Ready account
- Prepare for Session SEVEN:
  - Review tasks 22 25 in 50001 Ready
  - $\,\circ\,$  Download the playbooks for task 22 25, if desired
  - Have you selected internal auditors and set up an internal audit plan (22)?
  - $\circ$  Are audit findings recorded and corrected (22)?
  - Does top management review the EnMS periodically and provide input and guidance (23)?
  - Do you maintain records on any nonconformities, actions taken, and the effectiveness of corrective action (24)?







#### **Between Sessions**

#### As a routine, use the 50001 Ready Navigator to assign tasks and update task

#### completion status

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#### 50001 Ready - Resources

- 50001 Ready Program
  - https://www.energy.gov/eere/amo/50001-ready-program
- 50001 Ready Navigator
  - https://navigator.lbl.gov/
- Energy Footprint Tool
  - https://www.energy.gov/eere/amo/downloads/energy-footprint-tool
- EnPI Lite Tool
  - https://enpilite.lbl.gov/
- 50001 Ready at Better Building
  - https://betterbuildingssolutioncenter.energy.gov/better-plants/software-tools



#### Polling Question 5

5) Thinking about the resources on the previous slide, how many of these five have you looked at and/or used?

- A. All five
- B. Four
- C. Three
- D. Two

#### E. One

#### **RESOURCES**:

- 1) 50001 Ready Program
- 2) 50001 Ready Navigator
- 3) Energy Footprint Tool
- 4) EnPI Lite Tool
- 5) 50001 Ready at Better Building
- F. My links go to a dead-end screen, my internet crashed, and I lost my mouse, but the soft service ice cream machine is still working!







#### Polling Question

6) After listening to today's webinar session SIX, and now having covered tasks 1-21, how do you feel about 50001 Ready as a resource to help you with your energy management plans:

- A. Still overwhelmed
- B. Overwhelmed, but feeling much better
- C. Optimistic
- D. Very encouraged
- E. Ready to get Ready
- F. "There's no crying in baseball!" (or energy management!)





#### And now, our Kahoot Quiz Review Game







#### **Question and Answer Time**







#### Please Contact Us With Any Questions



Kevin Sawyer (919) 857-9034 {desk} (919) 906-7658 {cell} ksawyer@advancedenergy.org www.advancedenergy.org



Michael Stowe (919) 857-9043 {desk} (919) 904-0279 {cell} mstowe@advancedenergy.org www.advancedenergy.org



