



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

ORNL 50001 Ready Training
Webinar Series, Session 7
March 31, 2026
10:00 a.m. to 12:30 p.m.

Agenda – Session SEVEN

- Welcome, Safety, and Housekeeping
- Review Previous Sessions
- Today's Content: **Ensuring Continual Improvement**

PERFORMANCE EVALUATION, Section 6:

- Task 22 – Internal Audit
- Task 23 – Management Review

IMPROVEMENT, Section 7:

- Task 24 – Corrective Action
- Task 25 – Continual Improvement
- Webinar Training Schedule & Preparations
- Kahoot Quiz Game
- Q&A

But first,
a POLL!



Polling Question 1

Polling Question


- 1) Based on what you have learned so far in this 50001 Ready training, what level of energy management do you feel that your organization will work to achieve?
 - A. I am not sure what our plans are.
 - B. We will incorporate many of the principles we have learned to improve our energy management system.
 - C. We plan to achieve 50001 Ready Recognition from DOE.
 - D. We plan to achieve and maintain ISO 50001 third party certification.

Welcome

- Welcome to the Virtual INPLT 50001 Ready webinar training series
- Eight, 2.5-hour webinars, focused on Strategic Energy Management (SEM), in general, and the ISO 50001 standard and 50001 Ready Navigator, in particular
- The webinars will help you understand the why and how of SEM and the 50001 Ready Navigator tool
- Thank you for your interest!



Safety and Housekeeping

- Please make sure your surroundings are safe
 - If you are driving, please use hands-free mode
 - If you are in a building, be sure you know the exit paths
 - If you are at home, be sure there are no distractions
- You are welcome to ask questions at any time
- When not asking a question, please mute your mic 
- We are recording these webinars, and by staying online, you are giving consent to be recorded
 - A link to the recorded webinars will be provided

Our 50001 Ready Training Group



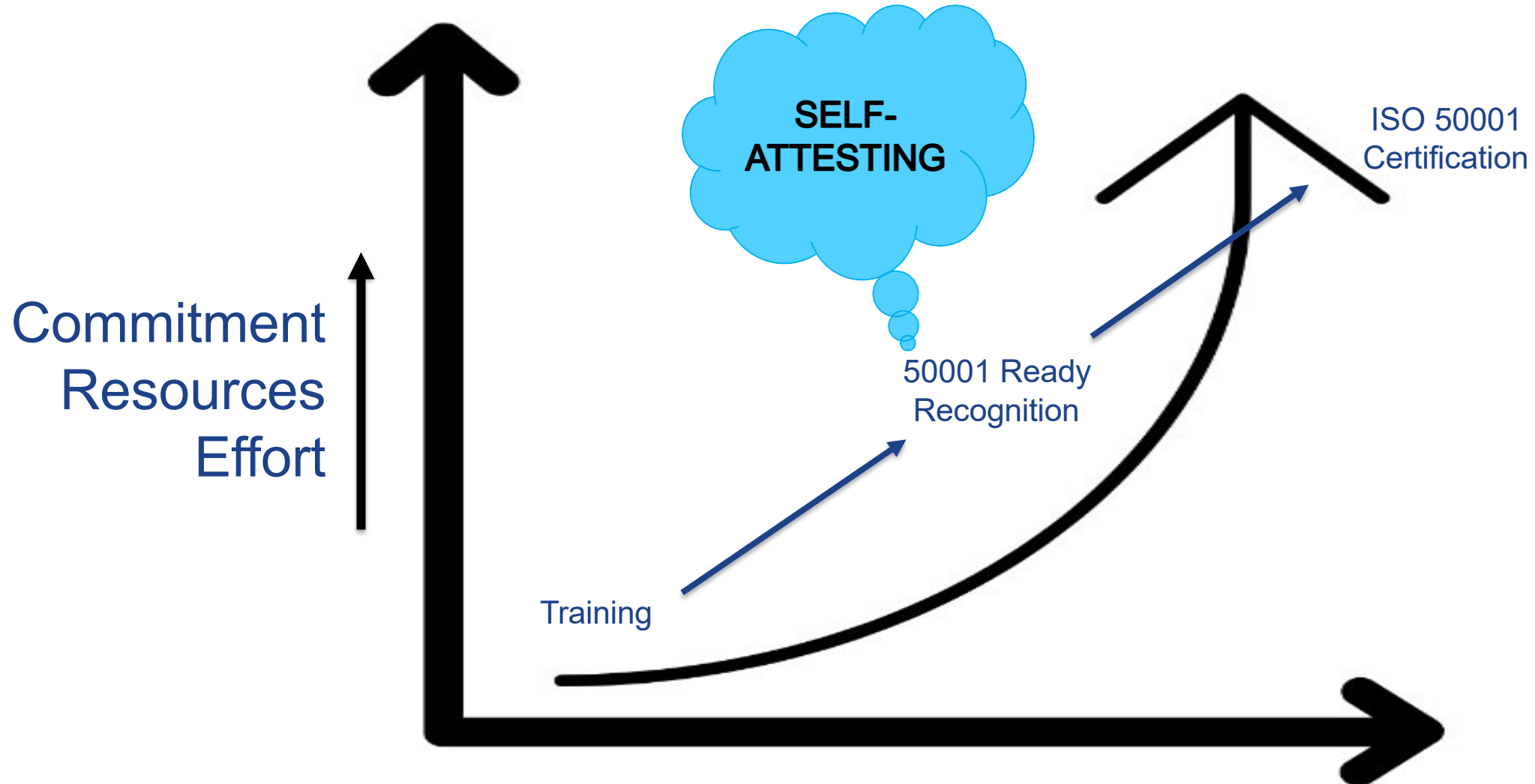
Review of Previous Sessions

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 – REPEAT!

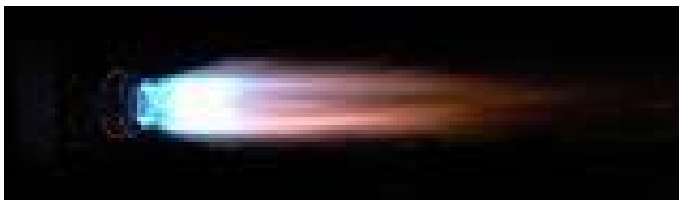
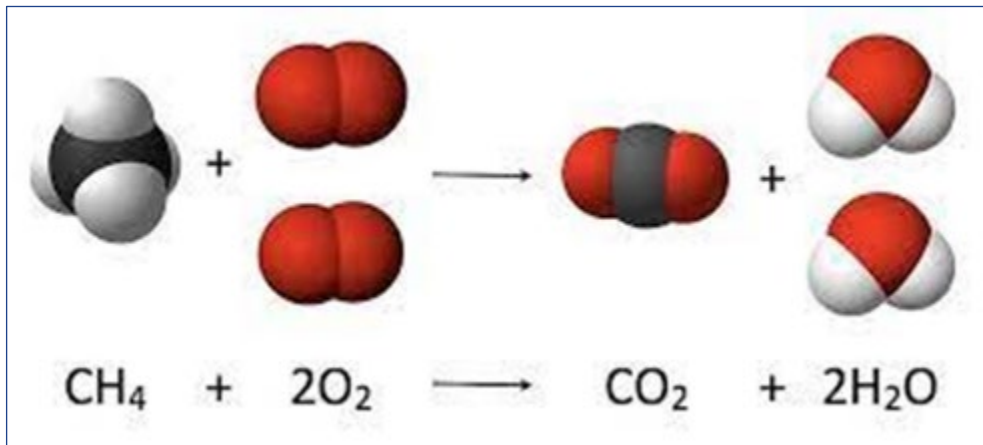


Pathways for 50001 Energy Management

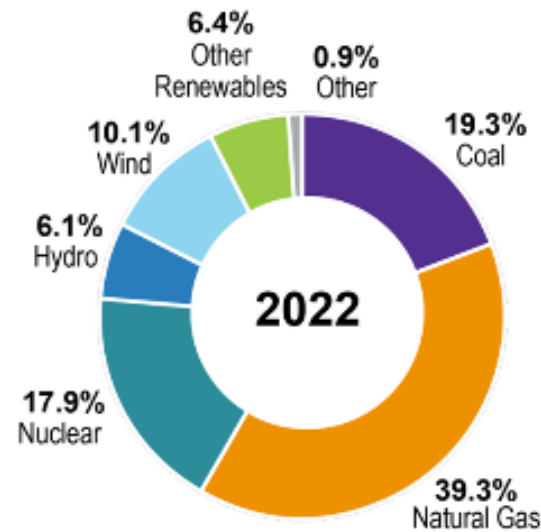


Why SEM? – The Energy –Carbon Connection

- The best way to manage your carbon is to manage your energy.



Electric Companies Use a Diverse Mix of Resources to Generate Electricity



2022 National Energy Resource Mix

*Other (Renewables) includes geothermal (or large-scale solar, private (or rooftop) solar, geothermal, and generation from biomass sources (agriculture waste, landfill gas recovery, municipal solid waste, wood, non-wood waste).
*Other includes generation by fuel oil, tires, batteries, chemicals, hydrogen, pitch, purchased steam, sulfur, and miscellaneous technologies.
Source: U.S. Department of Energy, Energy Information Administration.

EEl



Context of the Organization (Tasks 1 - 3) + 7

Building a foundation for your EnMS



Regarding my EnMS, what are the:

- *Risks, opportunities and strategic issues (1 & 7);*
- *Legal and other requirements (2);*
- *Interested parties (2);*
- *Scope and boundaries (3)?*

Leadership (Task 4 - 6)

Commitment and guidance from the top



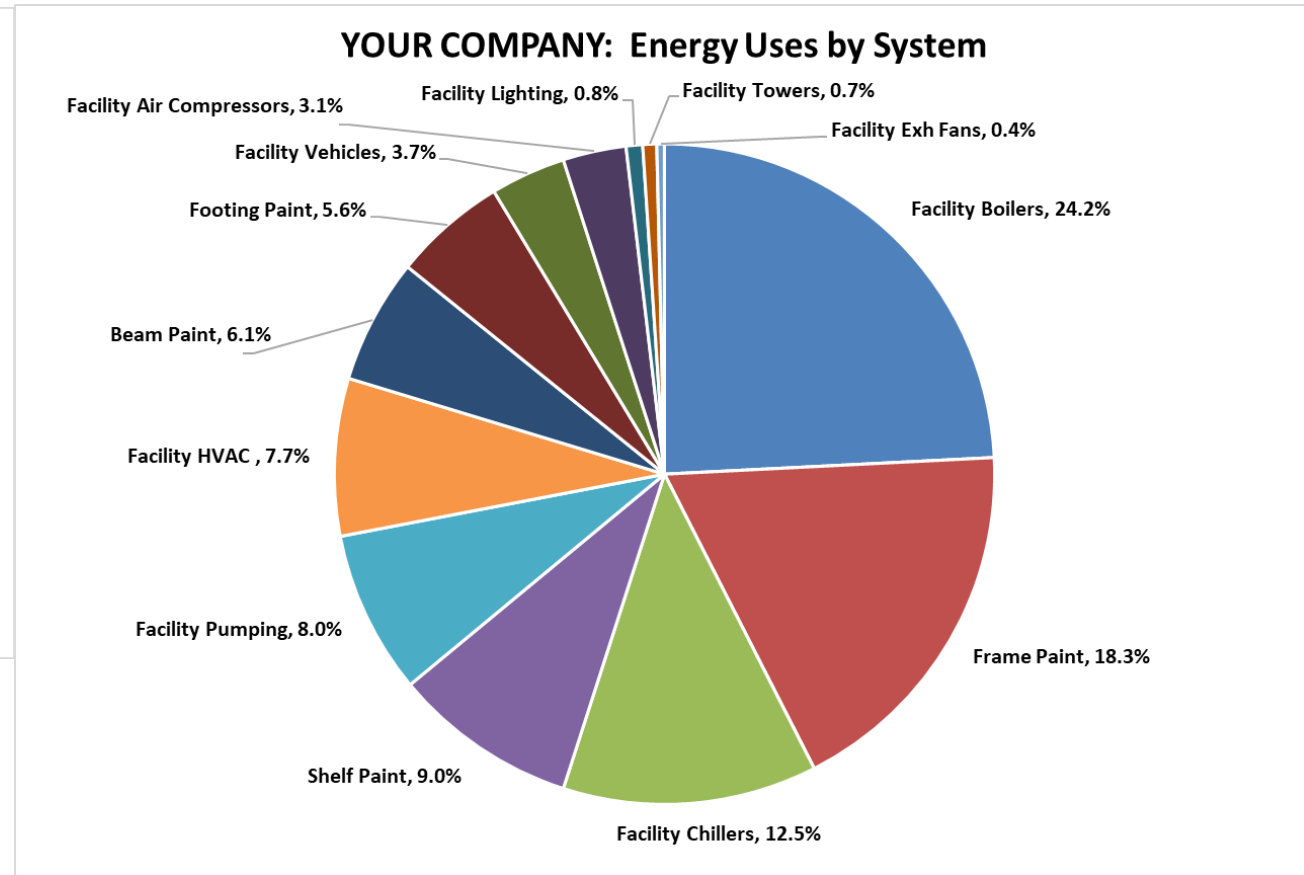
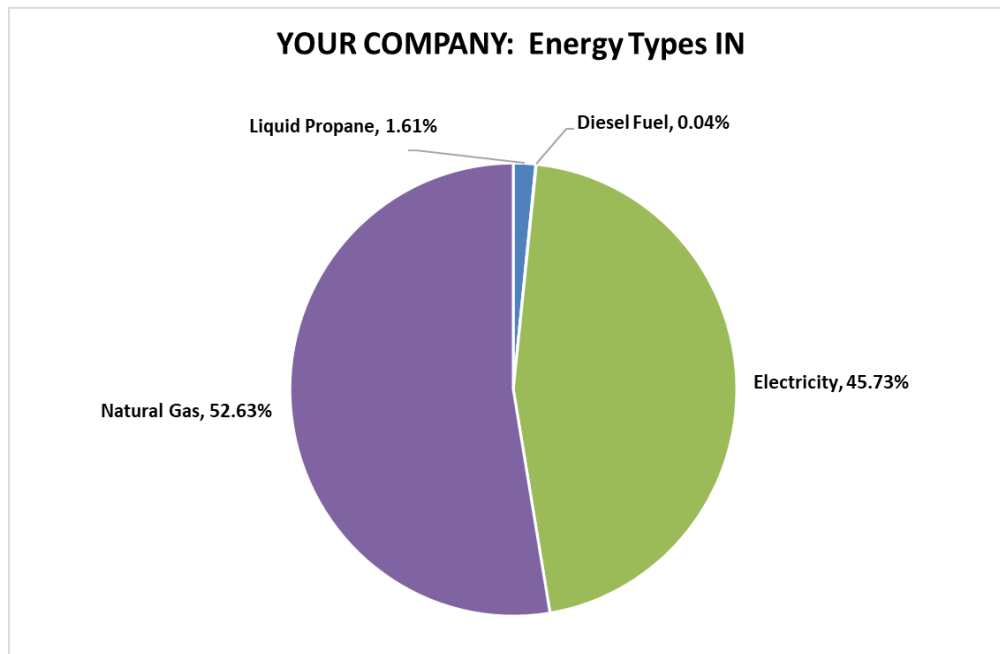
Is there strong top management commitment to the EnMS (4)?

Is there a clear and well-communicated energy policy (5)?

Are there adequate resources for the energy team to carry out the implementation of the EnMS (6)?

Planning - Two Key Pie Charts (Tasks 7 – 13)

Understanding your energy performance



What energy comes into my site (8)?

Where does all this energy go (9)? [SEUs]

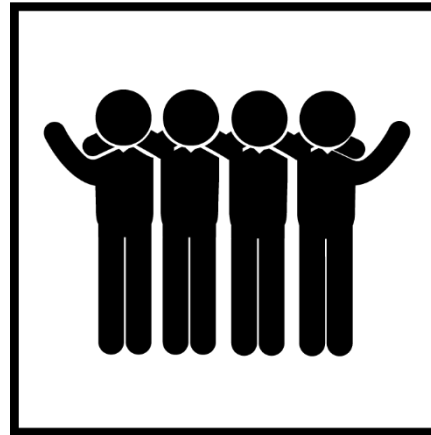
What are my energy saving projects (10)?

What are my EnPIs and EnBs (11)?

What are my objectives, energy targets & action plans (12 & 13)?

Support (Tasks 14 – 16)

Ensure all team members who impact energy performance understand their role



Who impacts energy performance and our EnMS (14 & 15)?

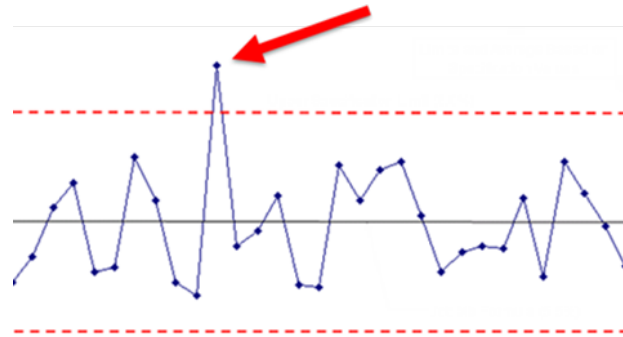
Are they aware, competent, trained, documented (14 & 15)?

Is our training for them effective (14 & 15)?

Do we maintain good documentation and records of our EnMS (16)?

Operation (Tasks 17 - 19)

Operate, maintain, design and procure to optimize energy performance



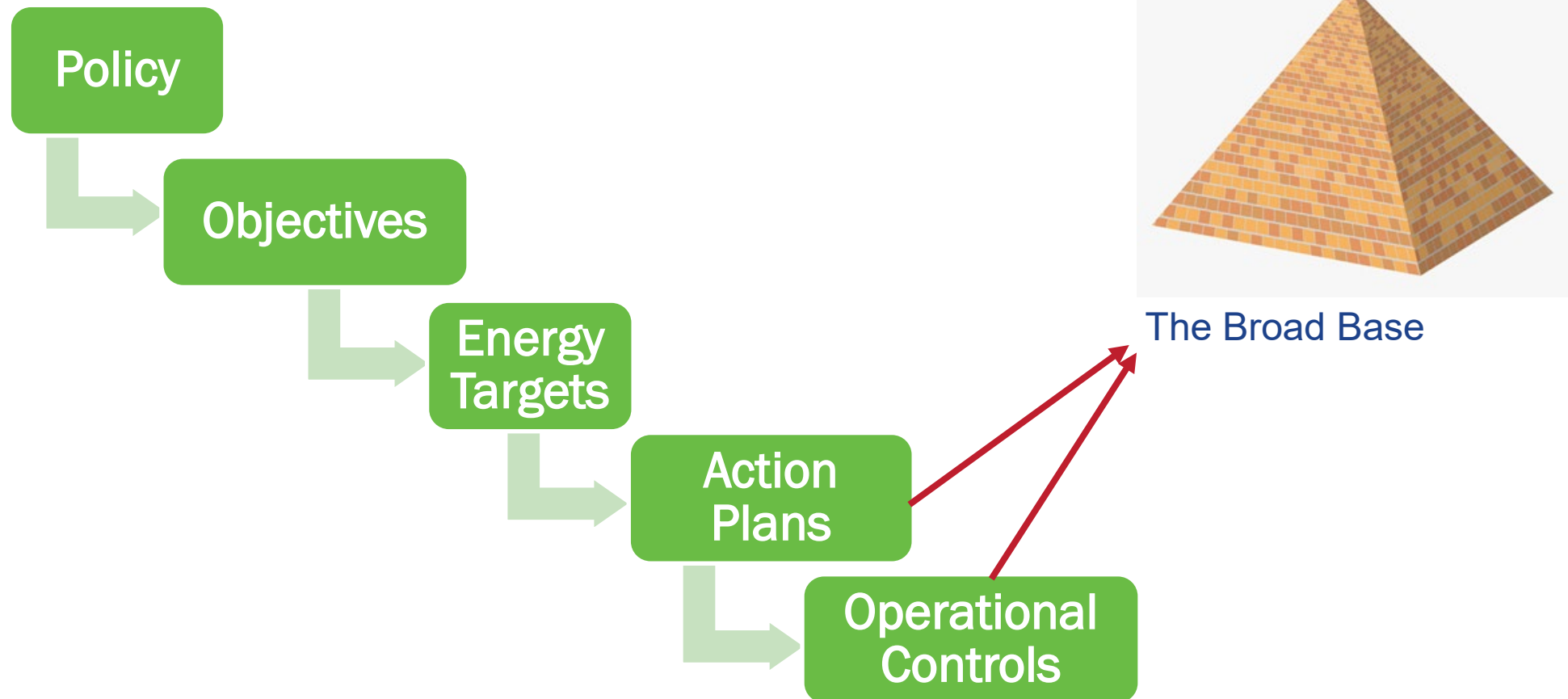
Do I have good operational and maintenance controls for my SEUs and action plans (17)?

Do my operators know what to do when energy expectations are not met (17)?

Are design and procurement teams are engaged (18 & 19)?

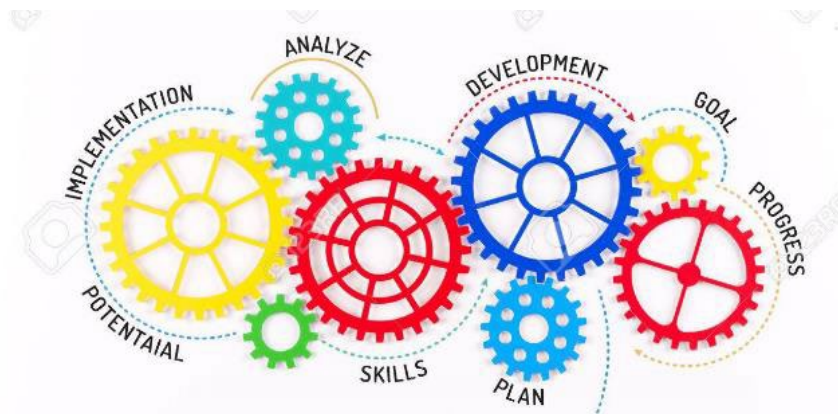
Tasks 1-13 + 17: The Big Picture

- Building the energy success pyramid starts with a wide base of small actions that build to the completion of energy policy



Performance Evaluation (Tasks 20 -23)

CHECK on how you are doing for **both** your EnMS and your energy performance improvement



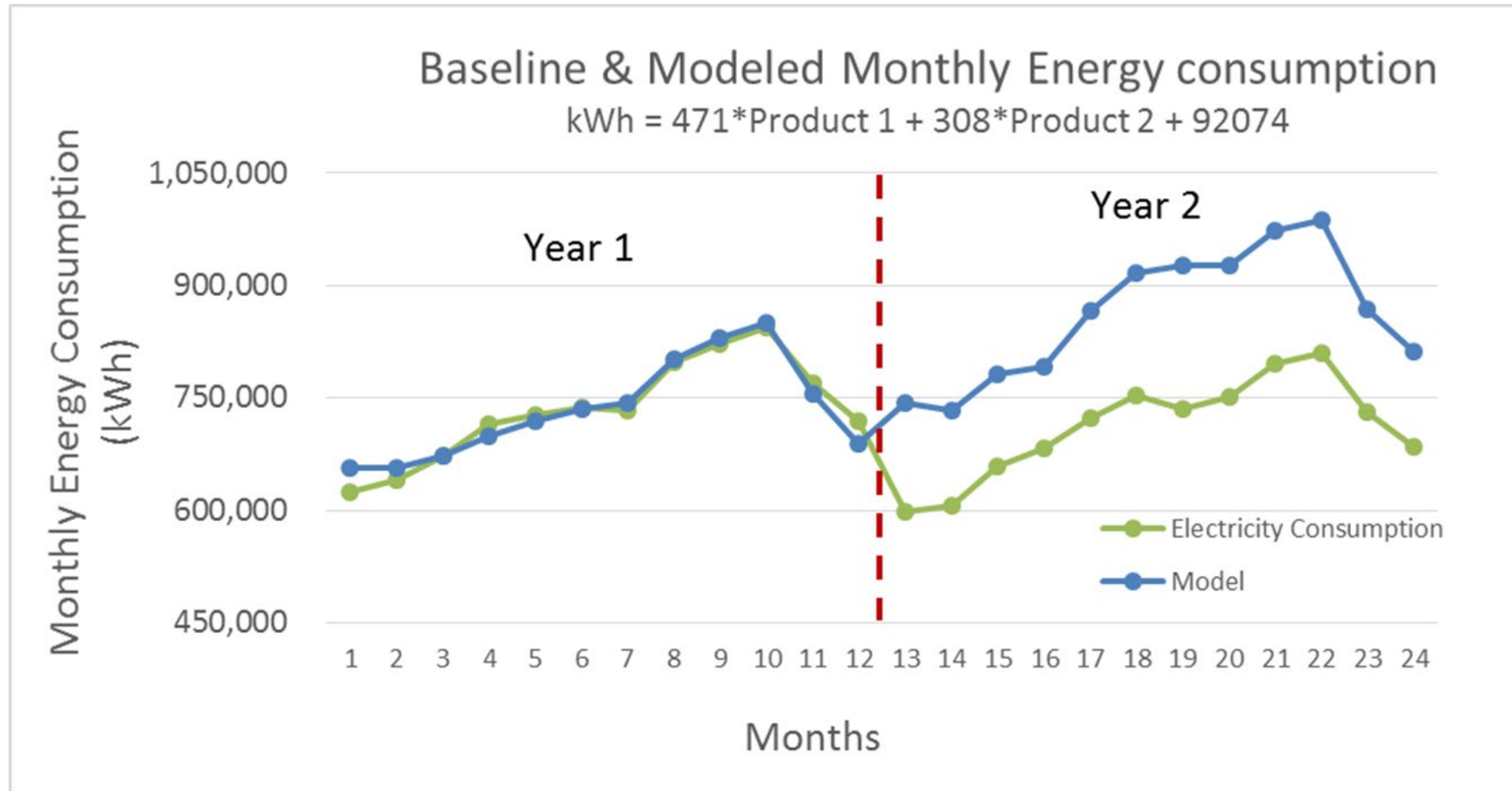
Are you effectively monitoring and measuring your EnMS and your energy performance improvement? (20 & 21)

How are your tracking systems working? (20 & 21)

Are internal audits and management reviews all set up? (22 & 23) [Session 7]



Task 21: MMA&E Energy Performance



50001 Ready 8-Month Cohort: Reminder



- = (1) Pre-training orientation and data collection
- = (8) 2-hr Group Training Sessions – Every four weeks
- = (8) 1-on-1 Coaching Calls – Scheduled two weeks after training
- = (1) Post-Training follow up assessment and data collection
- = Homework and Site Implementation between sessions

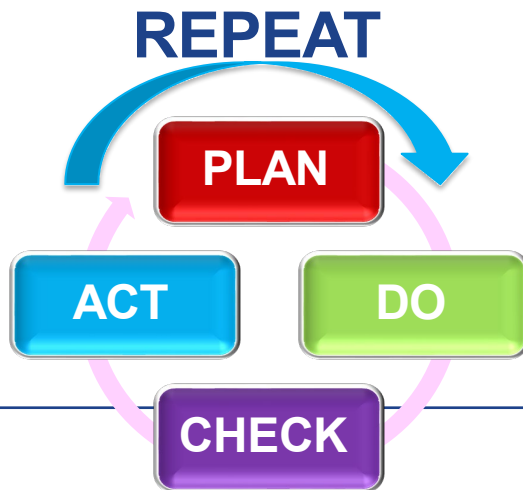
Month 1							Month 2							Month 3							Month 4						
S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S
					1	2		1	2	3	4	5	6		1	2	3	4	5	6					1	2	3
3	4	5	6	7	8	9	7	8	9	10	11	12	13	7	8	9	10	11	12	13	4	5	6	7	8	9	10
10	11	12	13	14	15	16	14	15	16	17	18	19	20	14	15	16	17	18	19	20	11	12	13	14	15	16	17
17	18	19	20	21	22	23	21	22	23	24	25	26	27	21	22	23	24	25	26	27	18	19	20	21	22	23	24
24	25	26	27	28	29	30	28							28	29	30	31				25	26	27	28	29	30	
31																											
Month 5							Month 6							Month 7							Month 8						
S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S
						1			1	2	3	4	5					1	2	3	1	2	3	4	5	6	7
2	3	4	5	6	7	8	6	7	8	9	10	11	12	4	5	6	7	8	9	10	8	9	10	11	12	13	14
9	10	11	12	13	14	15	13	14	15	16	17	18	19	11	12	13	14	15	16	17	15	16	17	18	19	20	21
16	17	18	19	20	21	22	20	21	22	23	24	25	26	18	19	20	21	22	23	24	22	23	24	25	26	27	28
23	24	25	26	27	28	29	27	28	29	30				25	26	27	28	29	30	31	29	30	31				
30	31																										

Polling Question 2

Polling Question

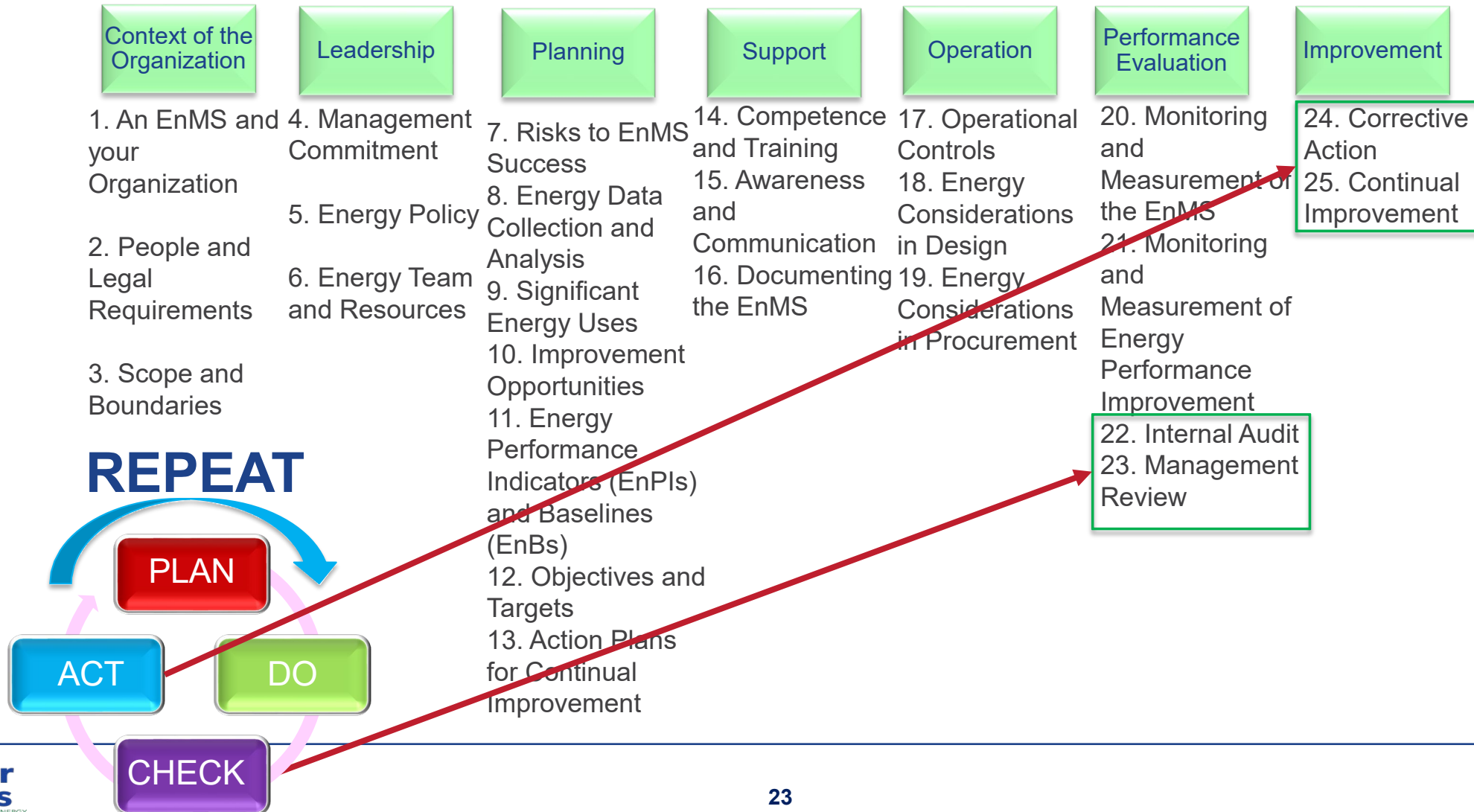
- 2) Based on your organization's goals for the implementation of an EnMS, what level of interest would you have in participating in a follow-on 50001 Ready 8-month cohort with deeper implementation and a longer time commitment?
- A. We are interested in this and would likely participate.
 - B. We are interested but need to know more about the process.
 - C. We would not be interested at this time but perhaps later.
 - D. We feel that we can move forward and meet our goals without cohort participation.

50001 Ready: Review Previous Tasks



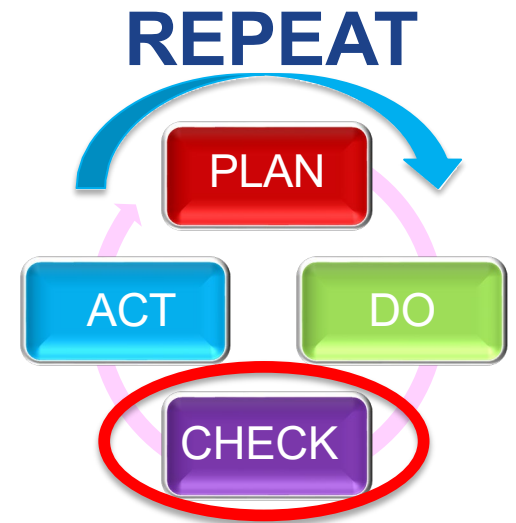
Today's Content: Tasks 22 - 25

50001 Ready Navigator: Today's Tasks



Performance Evaluation (Tasks 20 - 23)

CHECK on how you are doing for **both** your EnMS and your energy performance improvement



Are you effectively monitoring and measuring your EnMS and your energy performance improvement (20 & 21)?

How are your tracking systems working (20 & 21)?

Are internal audits and management reviews all set up (22 & 23)? [Today]



Continual Improvement (Tasks 24 & 25)

When we check, if things are not okay, then we ACT to fix them, and we do this as an ongoing process.



Do you have a strong corrective action program to fix and follow up on nonconformities to your EnMS (24)?

Do you continually improve both your EnMS and your energy performance (25)?

Task 22: Internal Audit

Task 22: We conduct internal audits of the 50001 Ready energy management system at specified intervals and report the results to relevant management.

We identify trends in internal audit results for consideration in management review.

Section 9.2 of the ISO 50001: 2018 standard



Task 22: Audit Defined

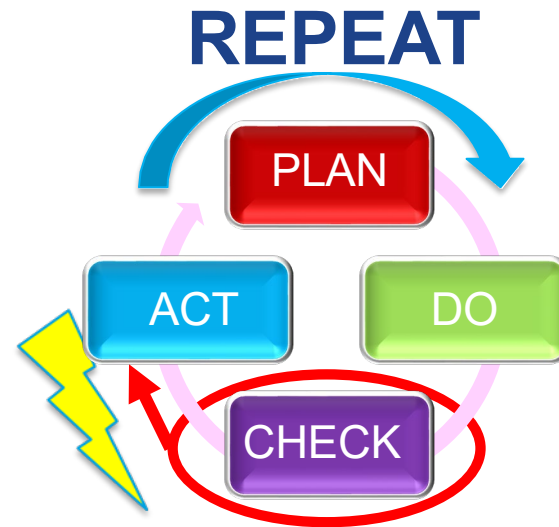
Definition 3.3.8

audit

- systematic, independent and documented process for obtaining evidence and evaluating it objectively to determine the extent to which the audit criteria are fulfilled
- Audits can be internal or external
- Today we are focusing on internal audits

Task 22: The Internal Audit Process

Determining Conformity



Task 22: The Internal Audit Process



Task 22: The Internal Audit Process

Internal Audits

- Organize audit team
- Develop checklists
- Conduct audit, gather evidence
- Compile audit results
- Produce audit report
 - Include in Management Review
- Process audit findings
 - Corrections, corrective actions and follow up



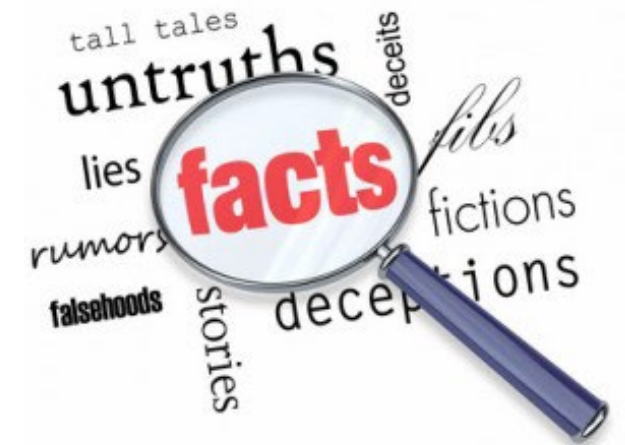
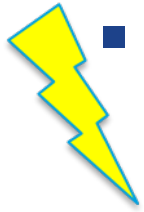
Task 22: The Internal Audit Process

- REMEMBER THESE!
- Anything that you invoke on yourself from your own EnMS requirements, processes, or procedures, are auditable under your internal audit program
- To ensure objectivity and the impartiality of the internal auditing process, personnel should not audit items that they developed or worked on.



Task 22: The Internal Audit Process

- Findings need to be based on facts and not opinion
- Findings should include:
 - Direct observations
 - Statement of facts, first-hand only, not hearsay
 - Documents, data, and records
 - Evidence
- First-hand, verifiable
- Touch it, see it , read it, hear it



Task 22: The Internal Audit Process

- Nonconformities
 - Non-fulfillment of a requirement is a nonconformance
- Nonconformities must a receive corrective action

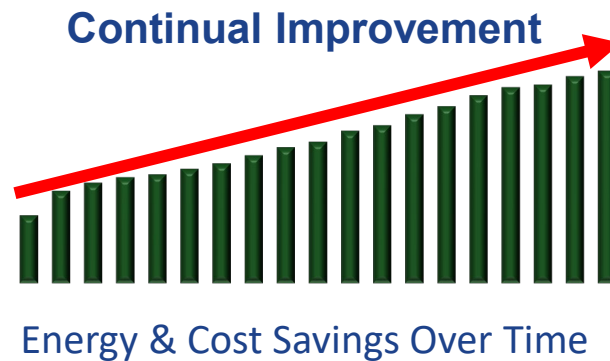


Task 22: The Internal Audit Process



Types of Nonconformities

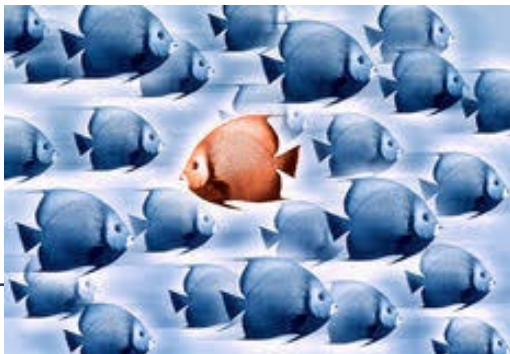
- Requirements of ISO 50001 are not met (Intent)
- The organization does not meet its own requirements (Implementation)
- The EnMS is not working (Effectiveness)
- There is no improvement in energy performance over time



Task 22: The Internal Audit Process

■ Nonconformity Examples

- No evidence of conducting management reviews
- Documented and planned operational control log sheets for air compressors (an SEU) not being filled out regularly
- No evidence of measurement of natural gas consumption for site boiler (an SEU) as required by the measurement and monitoring plan
- No response to significant deviations for operational controls on an SEU
- No evidence of competency gap closure for boiler operator certification



Task 22: The Internal Audit Process

■ Outputs of the Internal Audit

- Complete an internal audit report
- Document specific nonconformities on an audit finding form
- Turn over this information to the energy management team for action:
 - Enter findings into the Corrective Action Log
 - Take immediate actions, as needed to correct the immediate situation
 - Determine the root cause for the nonconformity
 - Implement corrective actions
- Evaluate effectiveness of corrective actions
- Make updates to the overall EnMS, as indicated
- Review internal audit results and trends as part of the management review

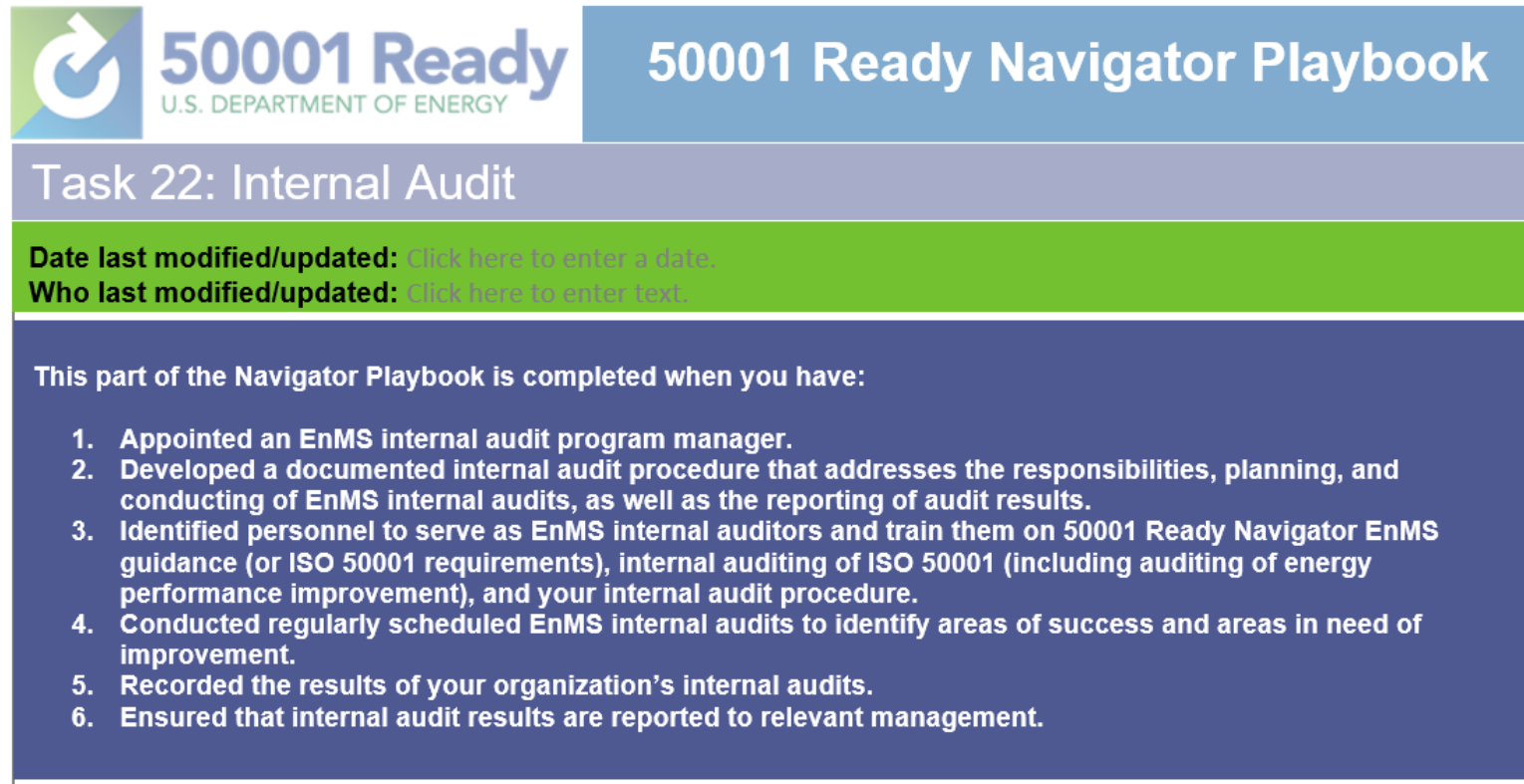
Audit Finding Form		
RECORD OF INTERNAL AUDIT NONCONFORMITY/CONCERN/POSITIVE FINDING		
Organization: Click here to enter text.	Auditor: Click here to enter text.	Standard: Click here to enter text.
Date: Click here to enter text.	Location of Finding: Click here to enter text.	
Type of Finding (check one): <input type="checkbox"/> Nonconformity <input type="checkbox"/> Concern <input type="checkbox"/> Positive Finding		
Facts Concerning the Finding*		
Statement of Criteria (Requirement): Click here to enter text.		
Objective Evidence (Statement of Finding): Click here to enter text.		
<small>* Statement of Criteria (Requirement) is not required for positive findings, but should be provided if appropriate.</small>		
Documentation Reference: Click here to enter text.		
ISO Requirement Reference: Click here to enter text.		
Auditee Signature: Click here to enter text.	Auditor Signature: Click here to enter text.	
<small>Auditee signature indicates that facts concerning the nonconformity are correct.</small>		



Task 22: Playbook

Activity

- Look at Task 22 in 50001 Ready
- Look at the Task 22 Playbook



The screenshot shows the '50001 Ready Navigator Playbook' page for 'Task 22: Internal Audit'. The page header includes the '50001 Ready U.S. DEPARTMENT OF ENERGY' logo and the title '50001 Ready Navigator Playbook'. Below the header, the task title 'Task 22: Internal Audit' is displayed. There are two green bars with placeholder text: 'Date last modified/updated: Click here to enter a date.' and 'Who last modified/updated: Click here to enter text.'. The main content area is dark blue and contains a list of six items under the heading 'This part of the Navigator Playbook is completed when you have:'. The items are: 1. Appointed an EnMS internal audit program manager. 2. Developed a documented internal audit procedure that addresses the responsibilities, planning, and conducting of EnMS internal audits, as well as the reporting of audit results. 3. Identified personnel to serve as EnMS internal auditors and train them on 50001 Ready Navigator EnMS guidance (or ISO 50001 requirements), internal auditing of ISO 50001 (including auditing of energy performance improvement), and your internal audit procedure. 4. Conducted regularly scheduled EnMS internal audits to identify areas of success and areas in need of improvement. 5. Recorded the results of your organization's internal audits. 6. Ensured that internal audit results are reported to relevant management.

Polling Question 3

Polling Question


- 3) Based on task 22 for internal auditing, what experience level does your organization have with this?
- A. We have an existing internal auditing program for ISO 50001.
 - B. We understand internal auditing of ISO systems but will need to improve and expand this to include ISO 50001.
 - C. We have not done any internal auditing, and we will have to establish this program for ISO 50001.
 - D. We plan to outsource our internal auditing needs to a contractor.
 - E. I do not know where our organization is with respect to internal auditing.

Task 23: Management Review

Task 23: Top management periodically reviews the 50001 Ready energy management system and our organization's energy performance to ensure its continuing suitability, adequacy and effectiveness.



Task 23: Management Review

 Management review is the engagement of top management in reviewing the EnMS and the energy performance, as well as asking and answering these questions:

- How have we done?
- Where can we improve?
- What do we need to change?
- Do we have enough resources in the right places?



Task 23: Periodic Review

Regular Topics

- Aligning EnMS with strategic direction
- Prioritized Performance Improvement Opportunities

Others as Appropriate

- Audit trends
- Energy Performance Improvements

Document:

Discussion

Decisions

Actions



Task 23: Playbook

Activity

- Look at Task 23 in 50001 Ready
- Look at the Task 23 Playbook



The screenshot shows a webpage titled "50001 Ready Navigator Playbook" from the U.S. Department of Energy. The page is for "Task 23: Management Review". It includes a green bar with the text "Date last modified/updated: Click here to enter a date." and "Who last modified/updated: Click here to enter text." Below this, a dark blue box contains a list of seven criteria for completing the management review.

50001 Ready
U.S. DEPARTMENT OF ENERGY

50001 Ready Navigator Playbook

Task 23: Management Review

Date last modified/updated: [Click here to enter a date.](#)
Who last modified/updated: [Click here to enter text.](#)

This part of the Navigator Playbook is completed when you have:

1. Defined the intervals at which top management will review the EnMS and energy performance.
2. Identified who must participate in the management review.
3. Compiled the relevant data and information (inputs) needed for the management review and prepared this information for presentation.
4. Conducted management reviews that address all required inputs and outputs.
5. Implemented the decisions and actions (outputs) of management reviews.
6. Determined if the EnMS continues to be suitable, adequate, effective and aligned with your organization's strategic direction.
7. Maintained a record of management reviews.

Task 24: Corrective Action

Task 24: We identify nonconformities and other problems in the 50001 Ready energy management system and take appropriate corrective action.



Task 24: Key Terms

- **3.3.3 nonconformity**
 - non-fulfilment of a *requirement* (3.3.1)
- **3.3.1 requirement**
 - need or expectation that is stated, generally implied or obligatory
- **3.3.4 corrective action**
 - action to eliminate the cause of a *nonconformity* (3.3.3) and to prevent recurrence



Task 24: First things First

- Control and correct the immediate situation, e.g., fix it now
- Examples:
 - Stop the leak
 - Reset the chiller supply water temperature
 - Reprogram the occupancy sensors
 - Change the air handler filters where the differential pressure had exceeded the specified level



Task 24: Impact and Why?

- **What is the impact?**
- **What is the need for further action.**
 - Do similar nonconformities exist?
 - Can similar nonconformities occur?
- **Why did this happen?**
 - Five Why's Exercise
 - Get to the root cause
- **Eliminate the root cause**
 - Take corrective action



Task 24: Effective?



- It is not enough to just find and fix the non-conformity
- You must determine that your action was effective
- It may be appropriate for an internal audit team member to follow up after some time has passed to check up on things

effectiveness

ef·fec·tive·ness

/i'fektivnəs/

noun: the degree to which something is successful in producing a desired result; success.

"the effectiveness of the treatment"



Task 24: Documentation

1. List of non-conformities from your internal audit
2. What action will you take?
3. Responsible party and timeline
4. Plan to follow up and check for effectiveness
5. Are any changes required for the EnMS?



Task 24: Playbook

Activity

- Look at Task 24 in 50001 Ready
- Look at the Task 24 Playbook

The screenshot shows the '50001 Ready Navigator Playbook' interface. At the top left is the '50001 Ready U.S. DEPARTMENT OF ENERGY' logo. The main title is '50001 Ready Navigator Playbook'. Below this is a section for 'Task 24: Corrective Actions'. A green bar contains four fields for user input: 'Date last modified/updated: Click here to enter a date.', 'Internal audit: Click here to enter a date.', 'Who last modified/updated: Click here to enter text.', and 'Management review: Click here to enter a date.'. Below the green bar, a dark blue box contains the text 'This part of the Navigator Playbook is completed when you have:' followed by a numbered list of three requirements.

50001 Ready
U.S. DEPARTMENT OF ENERGY

50001 Ready Navigator Playbook

Task 24: Corrective Actions

Date last modified/updated: [Click here to enter a date.](#) **Internal audit:** [Click here to enter a date.](#)
Who last modified/updated: [Click here to enter text.](#) **Management review:** [Click here to enter a date.](#)

This part of the Navigator Playbook is completed when you have:

1. Developed and implemented a process for taking corrective action at your organization.
2. Defined roles, responsibilities and authorities for the various steps in the corrective action process.
3. Trained employees on types of problems and nonconformities to be addressed through implementing the corrective action process.

Polling Question 4

Polling Question

- 4) Based on task 24 for corrective action, what experience level does your organization have with this?
- A. We have an existing corrective action program for other ISO systems, and we can readily add ISO 50001 to our program.
 - B. We have an existing corrective action for ISO systems but will need to improve and expand this to include ISO 50001.
 - C. We do not have any corrective action systems, and we will have to establish this program for ISO 50001.
 - D. I do not know where our organization is with respect a corrective action program.

Task 25: Continual Improvement

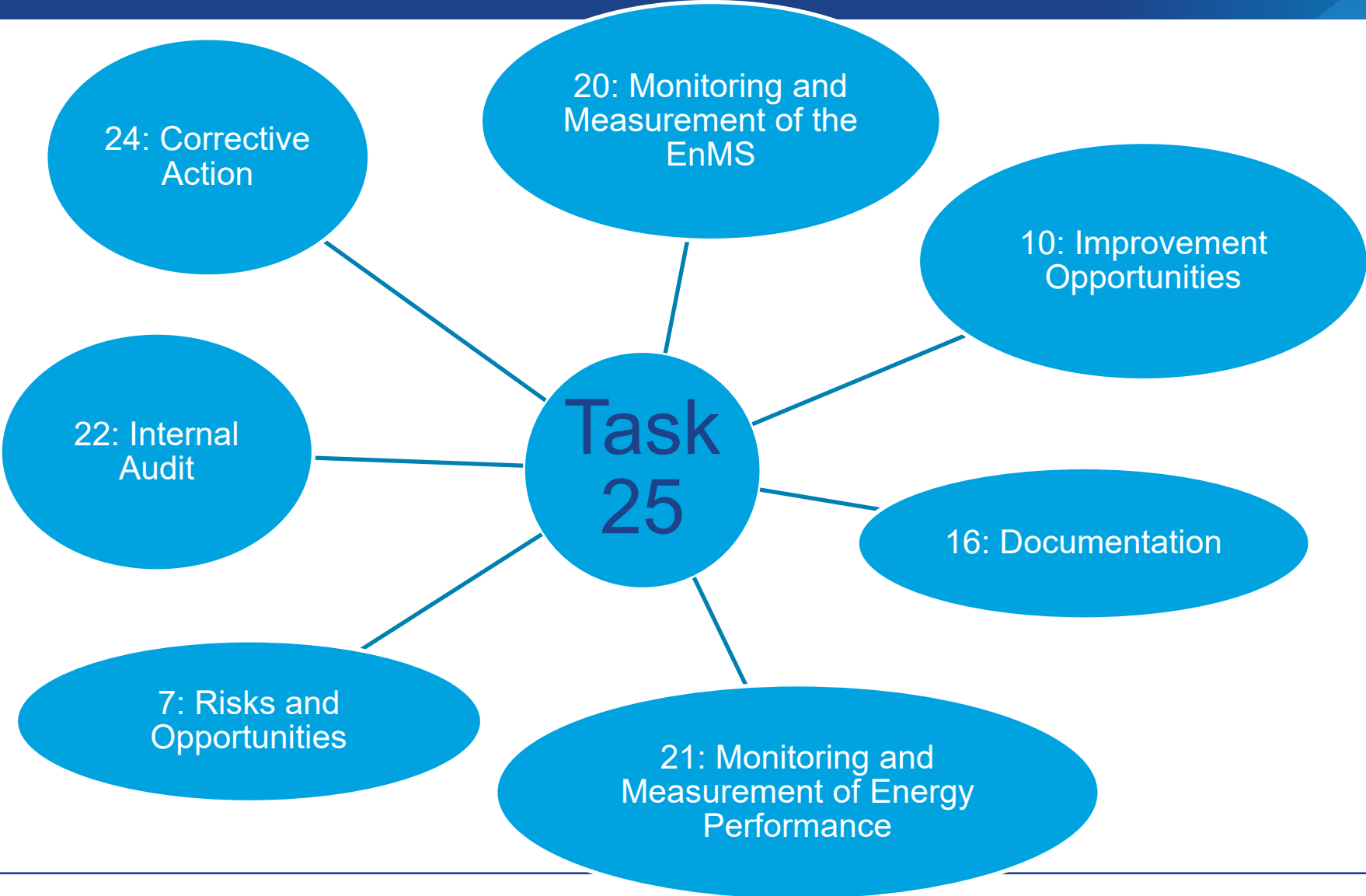
Task 25: We have a 50001 Ready energy management system and continually improve its processes and interactions.

We continually improve the suitability, adequacy and effectiveness of our energy management system.

We achieve and demonstrate continual energy performance improvement.

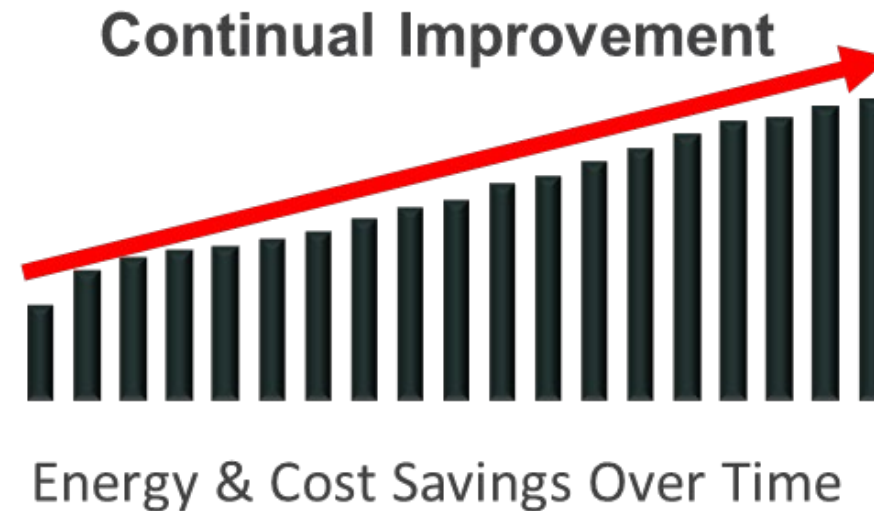


Task 25: Connecting the Tasks



Task 25: Continual Improvement

- You SHALL demonstrate continual improvement of your EnMS
- You SHALL demonstrate continual improvement of your energy performance



Task 25: Playbook

Activity

- Look at Task 25 in 50001 Ready
- Look at the Task 25 Playbook

The screenshot shows the '50001 Ready Navigator Playbook' for 'Task 25: Continual Improvement'. It includes a header with the '50001 Ready U.S. DEPARTMENT OF ENERGY' logo and the title '50001 Ready Navigator Playbook'. Below the title is a section for 'Task 25: Continual Improvement'. A green bar contains fields for 'Date last modified/updated', 'Internal audit', 'Who last modified/updated', and 'Management review', each with a 'Click here to enter...' prompt. A blue box below contains the text 'This part of the Navigator Playbook is completed when you have:' followed by a numbered list of five requirements for continual improvement.

50001 Ready
U.S. DEPARTMENT OF ENERGY

50001 Ready Navigator Playbook

Task 25: Continual Improvement

Date last modified/updated: Click here to enter a date. **Internal audit:** Click here to enter a date.
Who last modified/updated: Click here to enter text. **Management review:** Click here to enter a date.

This part of the Navigator Playbook is completed when you have:

1. Checked that processes are in place for reviewing and updating specific parts of the EnMS on a regular basis and that the relevant decisions on “how,” “when,” and “who” are made and implemented.
2. Confirmed that the needed connections between the processes of the EnMS and how the organization manages change are present.
3. Reviewed processes for integrating EnMS requirements into the organization’s business operations and practices.
4. Confirmed that top management promotes continual improvement as part of organizational culture and meets and demonstrates its responsibilities.
5. Ensured you have processes in place to continually improve the EnMS and energy performance.

Training Schedule & Preparations

Kahoot Quiz Game

Q&A

50001 Ready Navigator Tasks

Context of the Organization

1. An EnMS and your Organization
2. People and Legal Requirements
3. Scope and Boundaries

Leadership

4. Management Commitment
5. Energy Policy
6. Energy Team and Resources

Planning

7. Risks to EnMS Success
8. Energy Data Collection and Analysis
9. Significant Energy Uses
10. Improvement Opportunities
11. Energy Performance Indicators (EnPIs) and Baselines (EnBs)
12. Objectives and Targets
13. Action Plans for Continual Improvement

Support

14. Competence and Training
15. Awareness and Communication
16. Documenting the EnMS

Operation

17. Operational Controls
18. Energy Considerations in Design
19. Energy Considerations in Procurement

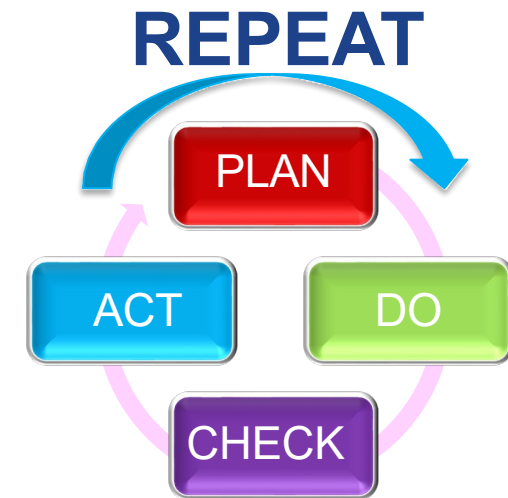
Performance Evaluation

20. Monitoring and Measurement of the EnMS
21. Monitoring and Measurement of Energy Performance Improvement
22. Internal Audit
23. Management Review


Improvement

24. Corrective Action
25. Continual Improvement

In Session EIGHT we will review all 25 tasks.



Training Schedule: By Session

1. An Overview – February 17, Done
2. Laying the Foundation of 50001 – February 24, Done
3. Where does all the Energy Go? – March 3, Done
4. Sorting out the Energy Data – March 10, Done
5. Engaging Other Functions – March 17, Done 
6. Evaluating Performance – March 24, Done
7. Ensuring Continual Improvement – Today-March 31
8. Wrap Up and Next Steps – Next-April 7

Always on
Tuesdays @
10:00 a.m. –
12:30 p.m.
Eastern

Preparation for Session EIGHT

- Prepare for Session EIGHT:
 - Review back over the 25 tasks of 50001 Ready
 - Think about items you would like to discuss and review in session 8

In Session EIGHT
we will review all
25 tasks.



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://betterbuildingsolutioncenter.energy.gov/better-plants/software-tools>

Polling Question 5

Polling Question

- 5) About how many hours have you spent each week in between sessions on homework, playbooks, preparations, online in the 50001 Ready navigator, etc.?
- A. > 3 hours
 - B. 2 to 3 hours
 - C. 1 to 2 hours
 - D. < 1 hour
 - E. Zero hours

Polling Question 6

Polling Question

- 6) After listening to today's webinar session SEVEN, and now having covered tasks 1-25, how do you feel about 50001 Ready as a resource to help you with your energy management plans:
- A. Still overwhelmed.
 - B. Cautiously optimistic.
 - C. Very encouraged.
 - D. Confident - Ready to get Ready.

And now, our Kahoot Quiz Review Game



Question and Answer Time



Thank You!



- Michael L. Stowe, PE, CEM, 50001 CP
- ORNL Virtual INPLT 50001 Ready Trainer
- Owner/Principal Engineer
- Stowe & Sons PLLC
- michael@stoweandsons.com
- (919) 904-0279