Better Plants®
U.S. DEPARTMENT OF ENERGY

Where to Start on Energy Management

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U.S. DEPARTMENT OF ENERGY

Today's Topics

- Quick List of Acronyms
- 50001: Training vs. Implementation
- Why Strategic Energy Management (SEM)?
- Why 50001?
- Overview of 50001 Ready Navigator Tool

50001 Ready
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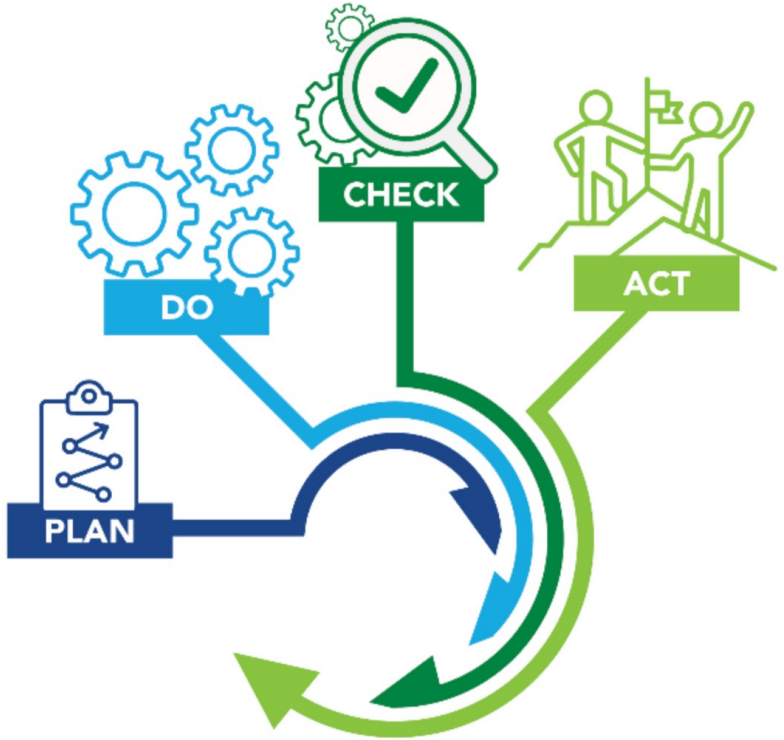


Quick List of Acronyms

SEM
Strategic Energy Management

EnMS
Energy Management System

SEU
Significant Energy Use

EnPI
Energy Performance Indicator

EnB
Energy Baseline

PDCA
Plan, Do, Check, Act

SEM & EnMS

Strategic Energy Management

- Strategic **approach** to energy management
  - Emphasizes continuous improvement
  - Focus on integrating energy management into everyday business practices
  - Emphasizes equipping and enabling plant management and staff to impact consumption through behavioral and operational change

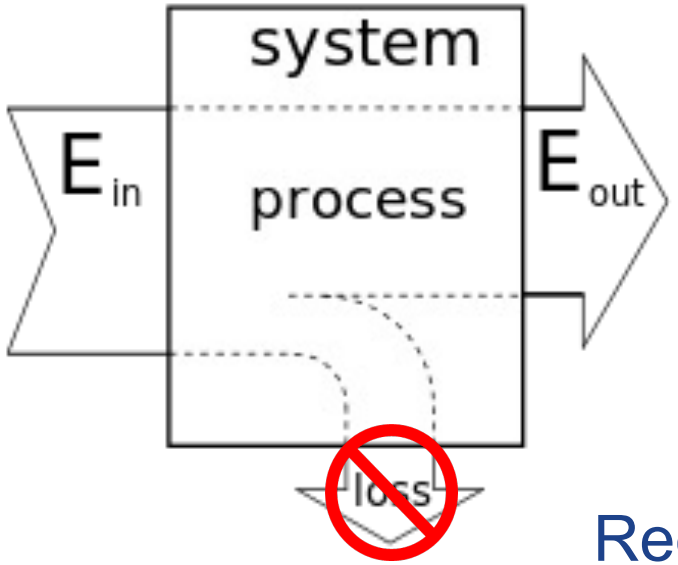
Energy Management System

- A **management system** to establish an *energy policy, objectives, energy targets, action plans, and process(es)* to achieve the objectives & energy targets

EnMS Provides framework and tools to implement SEM

Why SEM? – Energy Efficiency

This is what you pay for



This is value added

Reduce losses

Get as close to 100% as is technically and economically possible

Why SEM? – EE & EI

INCREASE Energy Efficiency (EE)

TO

REDUCE Energy Intensity (EI)

&

REDUCE Energy Costs $$$

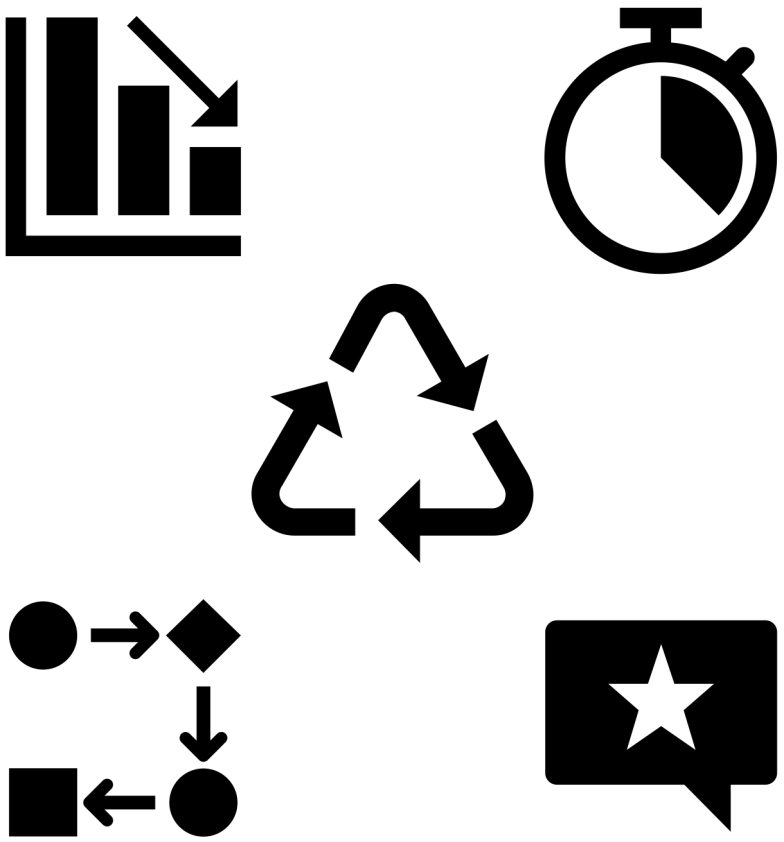
&

REDUCE Carbon Emissions!!

Why SEM? – Non-Energy Benefits

Non-Energy Benefits of Energy Projects:

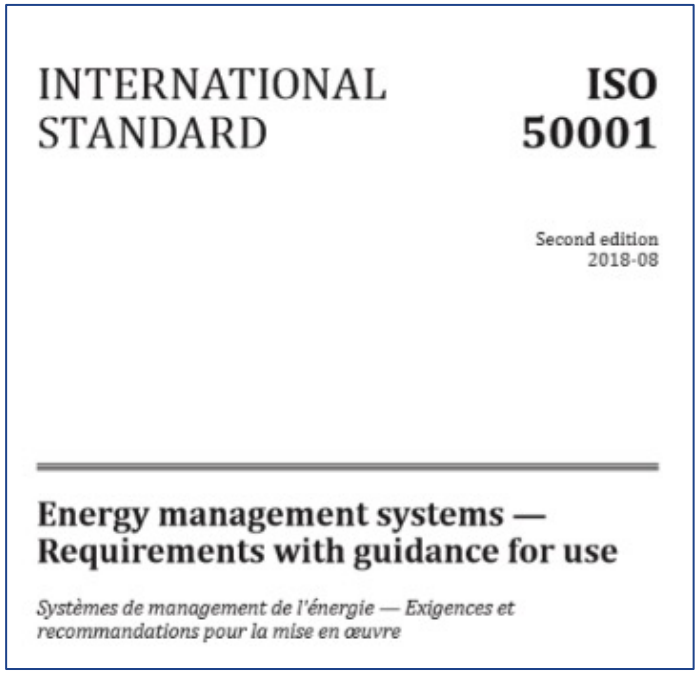
- Increase plant productivity
- Improve product quality
- Reduce scrap
- Break a process bottleneck
- Reduce overtime
- Improve worker comfort
- Increase available floor space
- Improve work-flow
- Reduce emissions
- Improve safety



What is ISO50001?

International standard that draws from **best practices around the world** – data-driven, flexible design helps organizations of all kinds and sized achieve **persistent energy & cost savings** over the **long term**.

ISO 50001
ENERGY MANAGEMENT


INTERNATIONAL STANDARD

ISO 50001

Second edition
2018-08

Energy management systems — Requirements with guidance for use

Systèmes de management de l'énergie — Exigences et recommandations pour la mise en œuvre

1. Scope
2. Normative references
3. Terms & Definitions
4. Context of the Organization
5. Leadership
6. Planning
7. Support
8. Operation
9. Performance Evaluation
10. Improvement

50001 Compatibility with Other ISO Standards

Leverage Common & Similar Elements

ISO 50001

ENERGY POLICY

Energy review
Energy performance indicators
Energy baseline
Energy management

Unique Elements: data-driven approach

ISO 14001

ENVIRONMENTAL POLICY

Environmental aspects
Emergency preparedness
Environmental management program

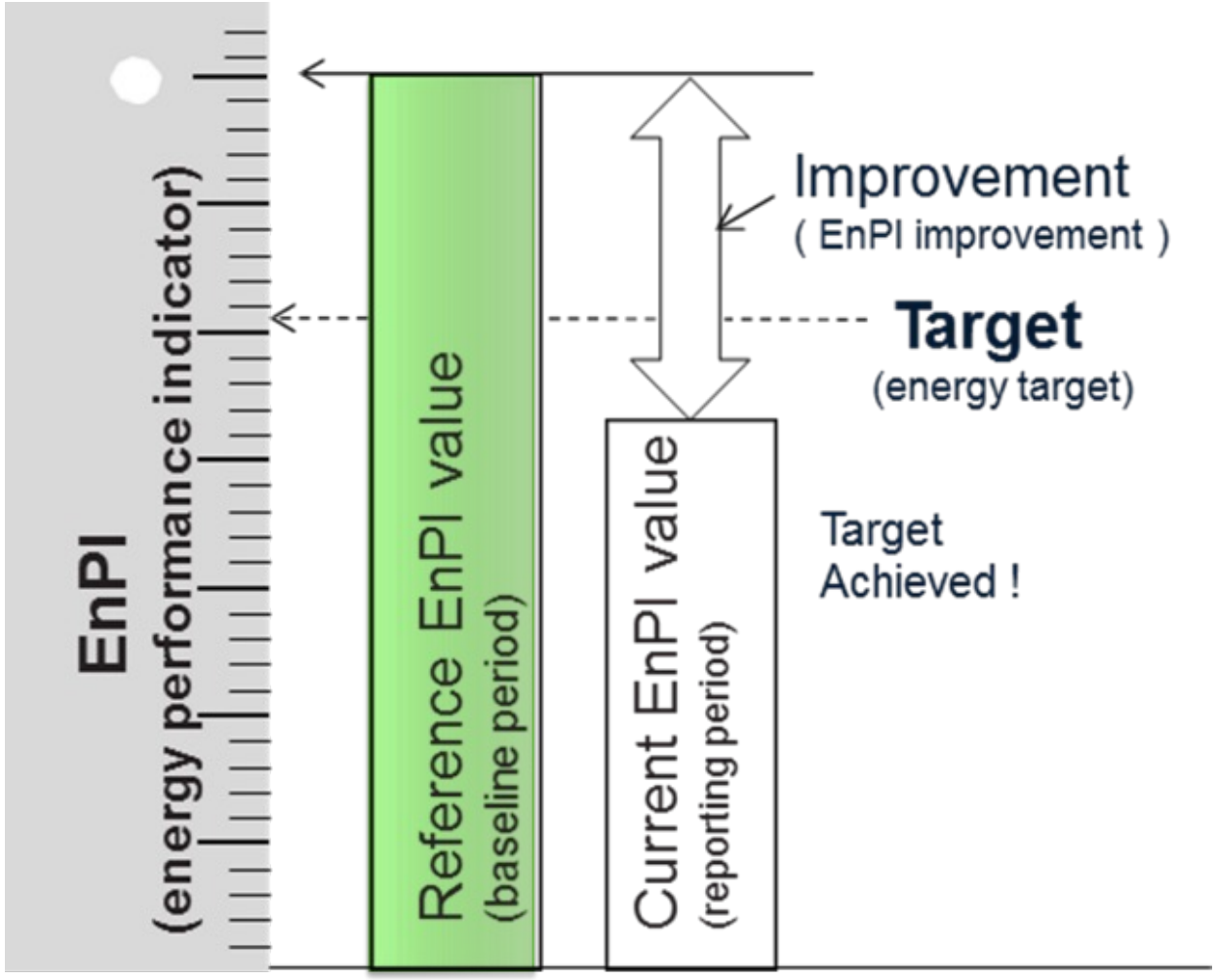
Management Commitment
Roles, responsibility & authority
Competence, training & awareness
Communication
Operational Control
Monitoring & Measurement
Documentation
Internal Audit
Corrective & preventative Action
Management review

ISO 9001

QUALITY POLICY

Customer focus
Planning of product realization
Customer-related processes
Control of nonconforming

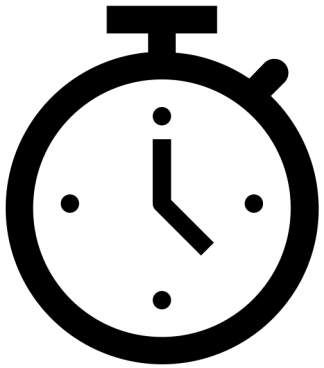
Why 50001? – Goal Oriented & Data Driven



Why 50001? – Requires Commitment

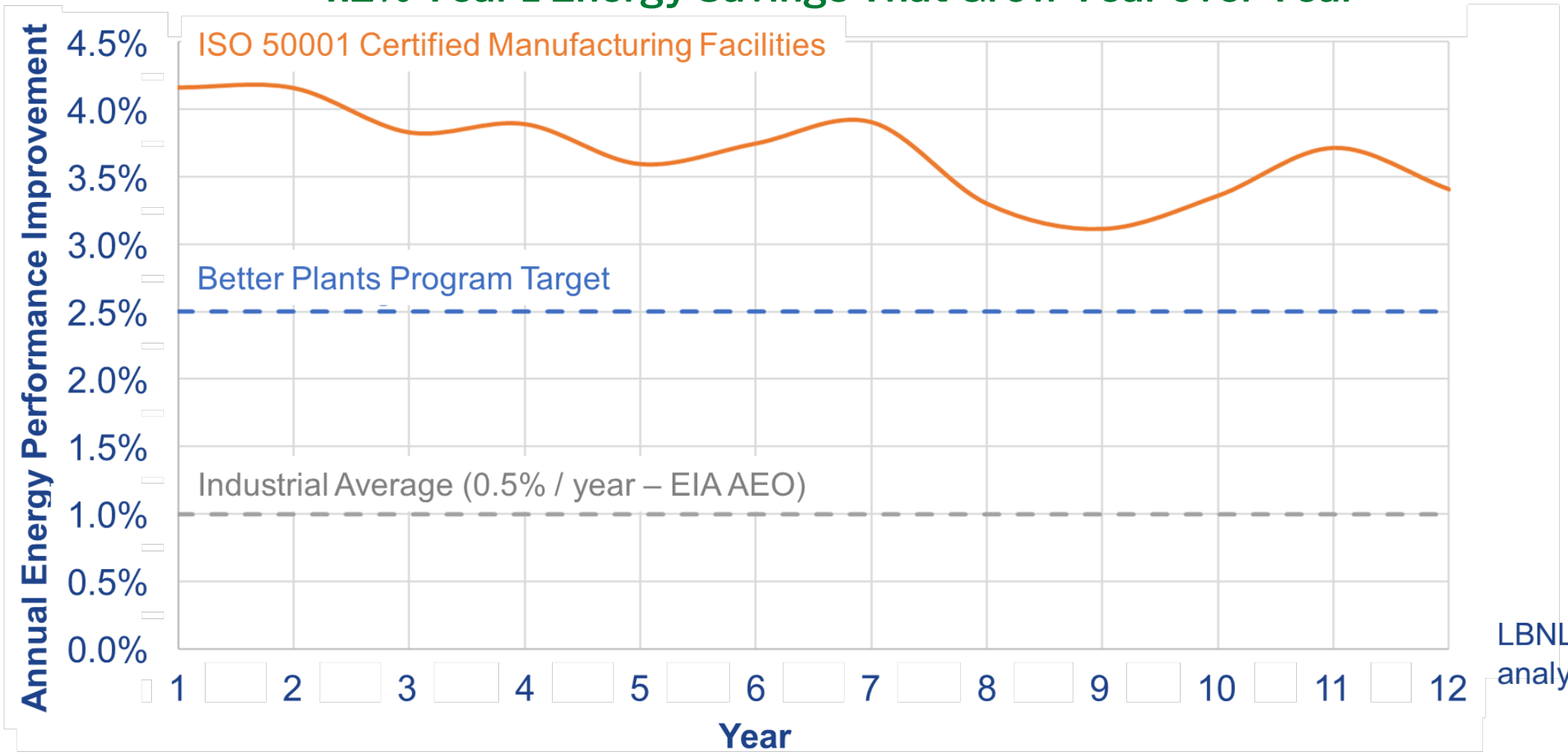
STRONG management commitment is essential:

- Allow time for energy team participation
- Allow time for EnMS development
- Provide resources needed to succeed
- Provide resources for travel to trainings, as needed
- Provide capital funding for energy improvement
- Communicate energy policy and its importance
- Provide resources for internal auditing
- Conduct meaningful management reviews



Why 50001? – Proven Results

4.2% Year 1 Energy Savings That Grow Year over Year

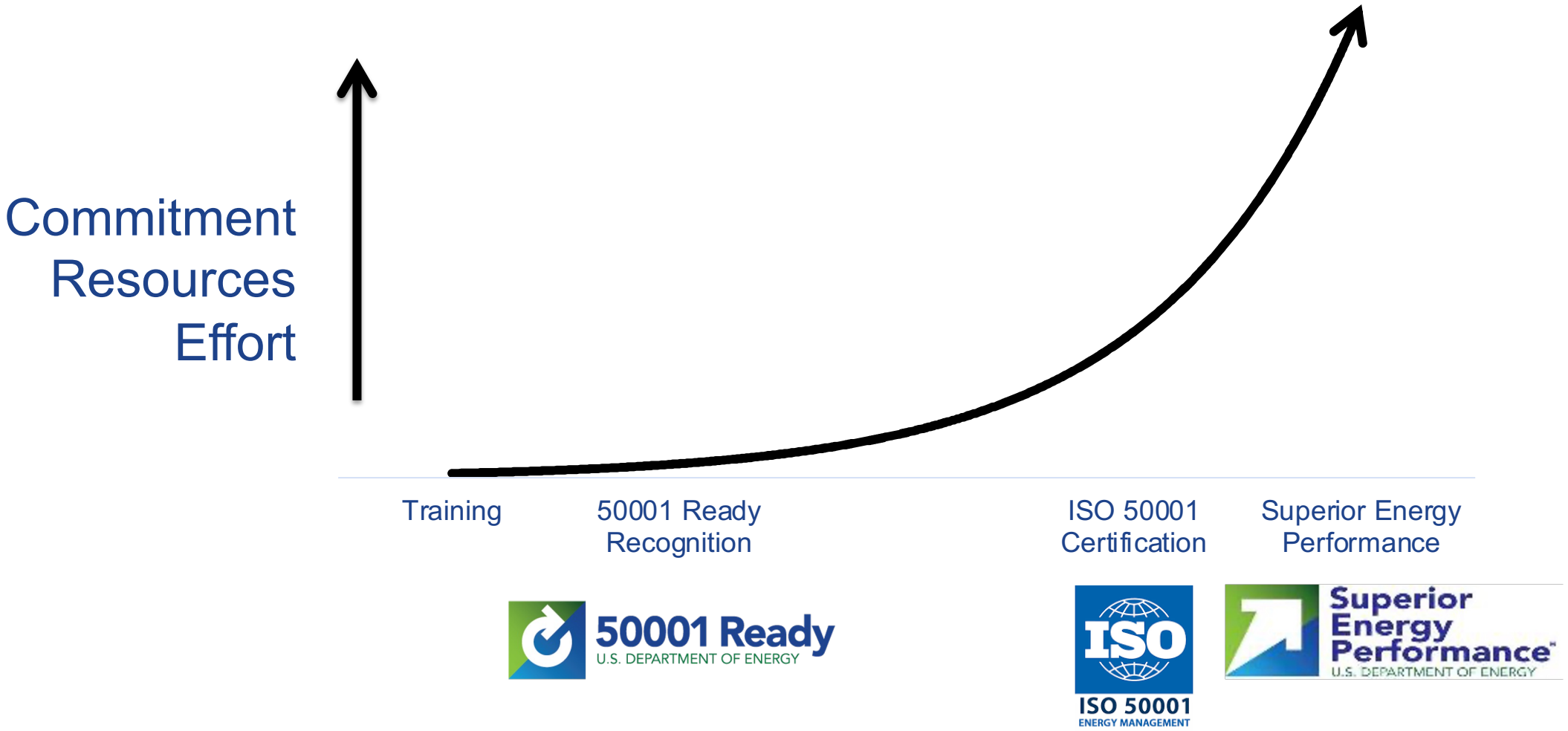


LBNL analysis

Why 50001? – Summary

- Worth the effort
- An alternative
- Help for the weary
- A heavy lift needs leverage
- The right tools
- Step-by-step
- Proven improvement
- Dashboard tracking
- Great resources
- Self attesting
- Lots of FREE support

EnMS Journey



A Pathway to Meet YOUR Organizations Goals

	50001 Ready U.S. DEPARTMENT OF ENERGY	ISO	Superior Energy Performance U.S. DEPARTMENT OF ENERGY
	SELF ATTEST	**CERTIFY**	**VERIFY**
Tasks Associated	• Complete 25 steps in Navigator • Self-attest to completion • Report energy performance	• ANAB-accredited audit • Receive certification from the certification body	• ISO 50001 certification • 3rd party SEP Performance Verification audit
Time Req.	Flexible	12-18 months	12-18 months

50001 Ready is part of a Pathway toward ISO 50001 Certification and (if desired) validated energy savings in SEP

Informal Polling Question

Where do you feel your company is?

A. Just starting with the basics
B. Have been working with Better Plants and are ready to engage more with 50001 Ready
C. Have some sites with 50001 Ready Recognition and plan to do more
D. Have some sites with ISO 50001 certification and plan to do more
E. Have plans to pursue Superior Energy Performance (SEP) at one or more sites

50001 Ready Navigator Overview

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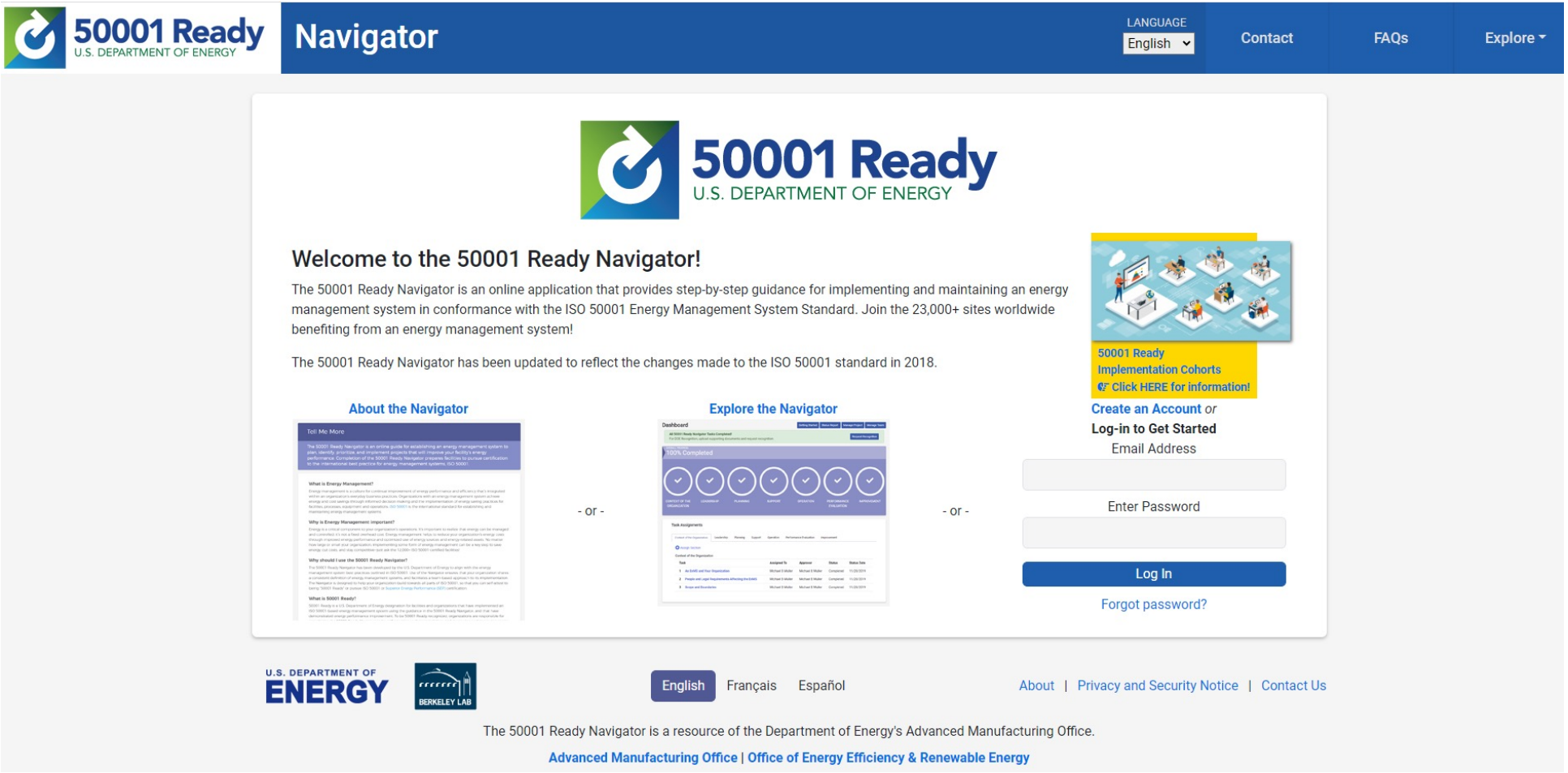
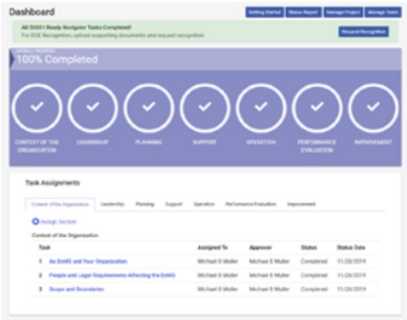
ENERGY

The 50001 Ready Navigator



Overview of 50001 Ready - The Tool

- Recognition for **self-attesting** to implementation of an EnMS based on the structure of ISO 50001
- **No certification required** from third-parties
- Open-source software tools, designed to be adopted by implementers
- **Suite of resources** to support continual improvement in institutional, commercial, and industrial facilities
- Able to support enterprise or **multi-facility** companies



50001 Ready Navigator

Navigator Task Worksheets

Overview of 50001 Ready - Tasks

50001 Ready Coaches train participants on how to implement each of the 25 steps toward building systematic energy management approach using the 50001 Ready Navigator

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. Risk to EnMS success
- 8. Energy data collection and analysis
- 9. Significant energy uses
- 10. Improvement opportunities
- 11. Energy performance indicators and baselines (EnPIs and 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

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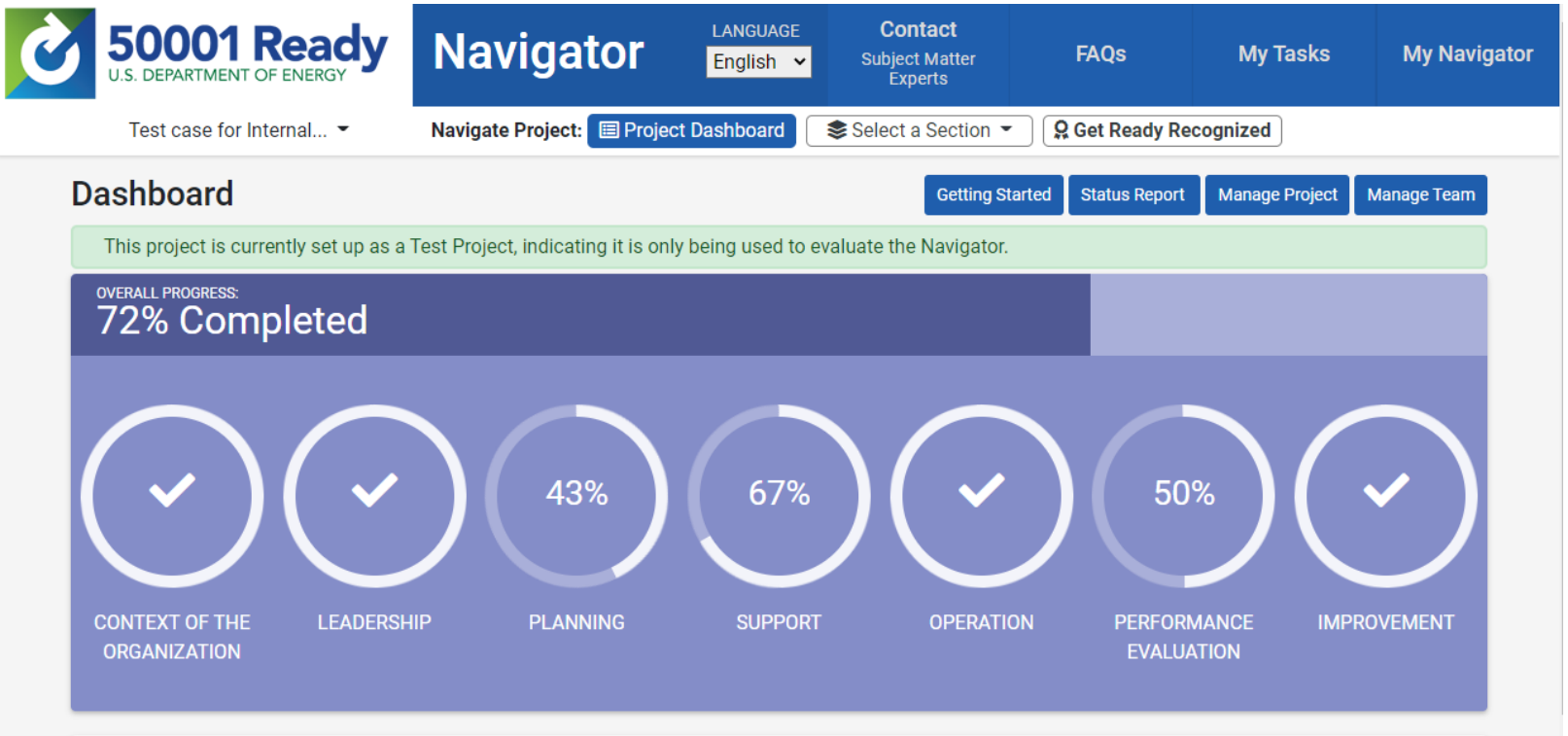
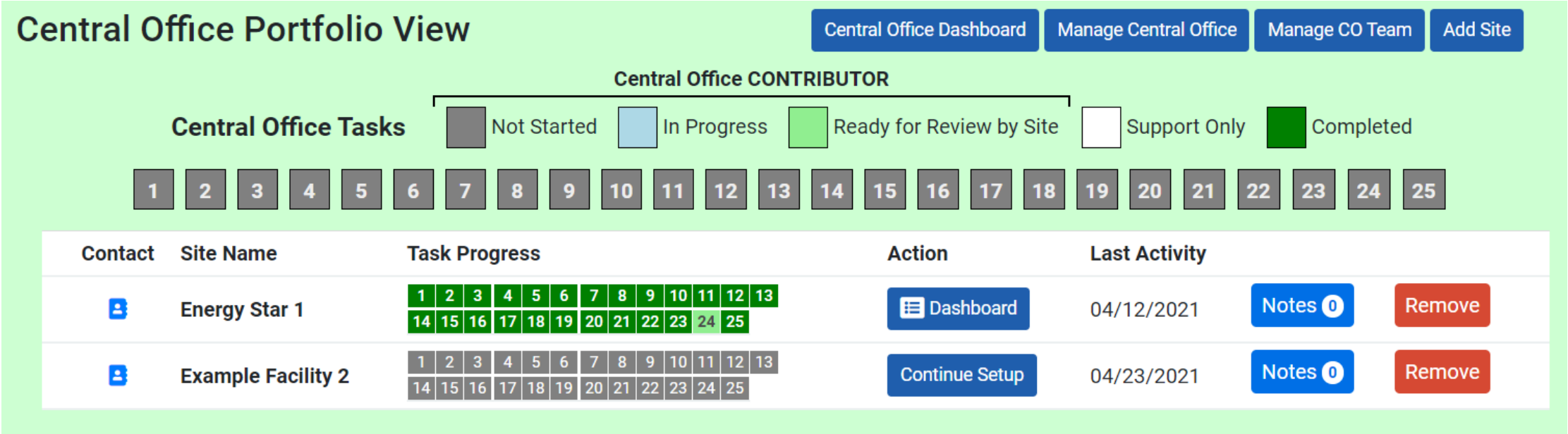
Overview of 50001 Ready - Dashboard

50001 Ready is an online, web-based 25 task process for energy management



Overview of 50001 Ready - Multisite

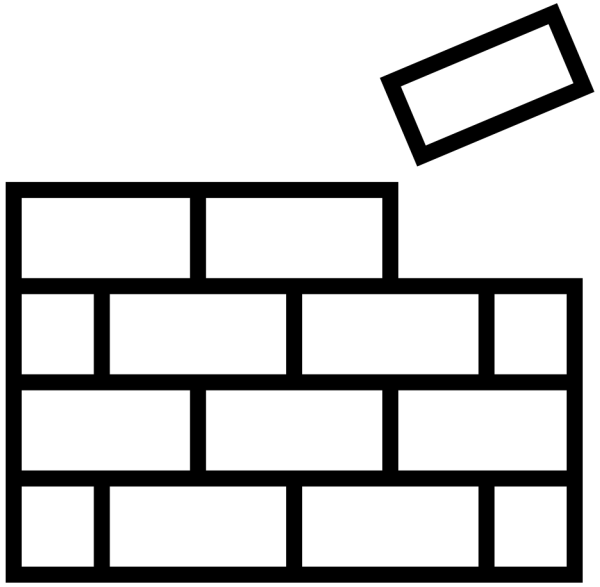
There is functionality for tracking a multisite effort with a central office with many separate locations working together



Centralized repository for understanding how your facilities manage energy

Context of the Organization (3 tasks)

Building a foundation for your EnMS



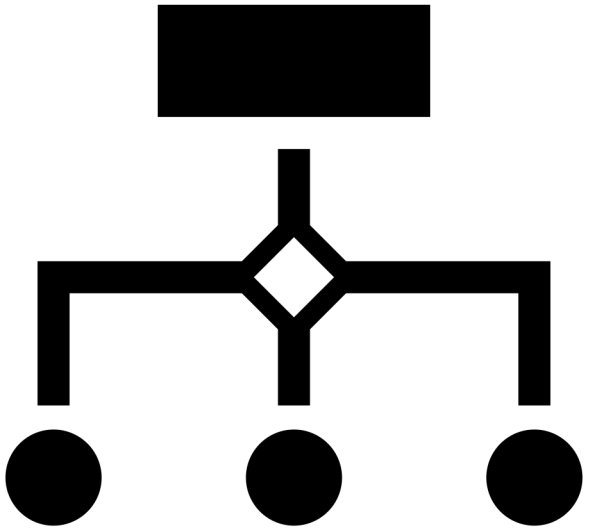
Regarding my EnMS, what are the:

- *Opportunities and strategic issues;*
- *Legal and other requirements;*
- *Interested parties;*
- *Scope and boundaries?*

Leadership (3 tasks)

Commitment and guidance from the top

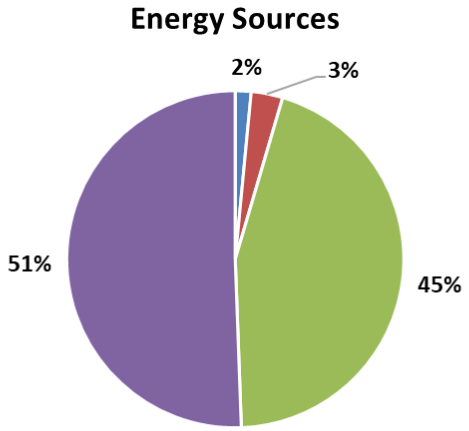
- *Is there strong top management commitment to the EnMS?*
- *Is there a clear and well-communicated energy policy?*
- *Are there adequate resources for the energy team to carry out the implementation of the EnMS?*

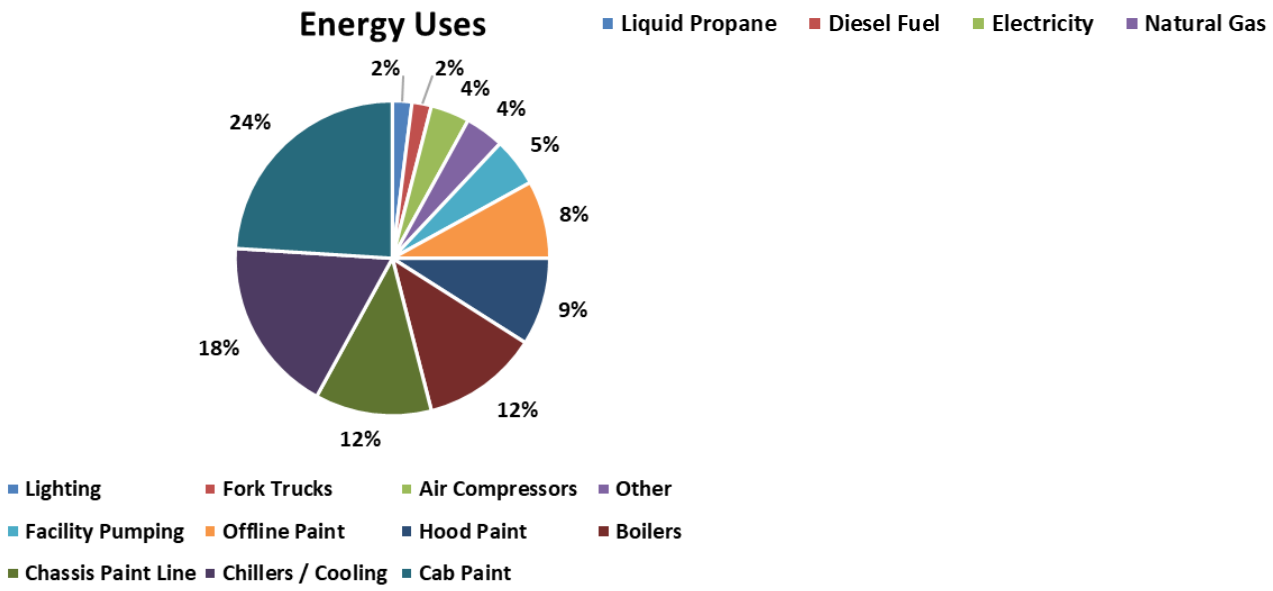


Planning (7 tasks) – Two Key Pies

Understanding your energy performance

- *What energy comes into my site?*
- *Where does all this energy go? [SEUs]*
- *What are my EnPIs and EnBs?*
- *What are my objectives, energy targets & action plans?*





Support (3 tasks)

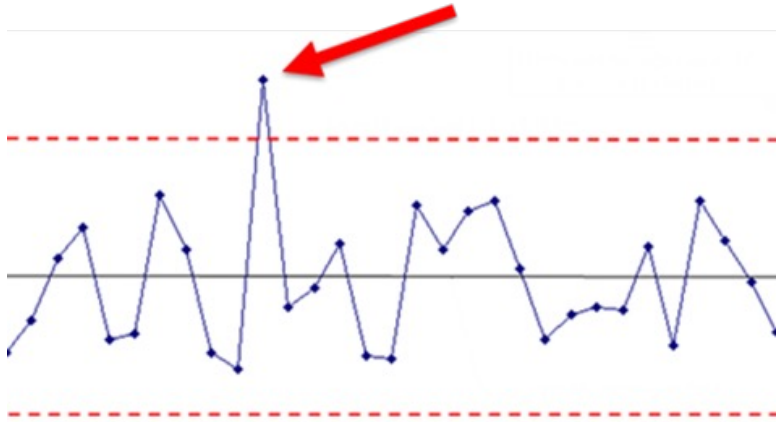
Ensure all team members who impact energy performance understand their role

- *Who impacts energy performance and our EnMS?*
- *Are they aware, competent, trained, documented?*
- *Is our training for them effective?*
- *Do we maintain good documentation and records of our EnMS?*

Operation (3 tasks)

Operate, maintain, design and procure to optimize energy performance

- *Do I have good operational and maintenance controls for my SEUs and action plans?*
- *Do my operators know what to do when energy expectations are not met?*
- *Are design and procurement teams are engaged?*



Performance Evaluation (4 tasks)

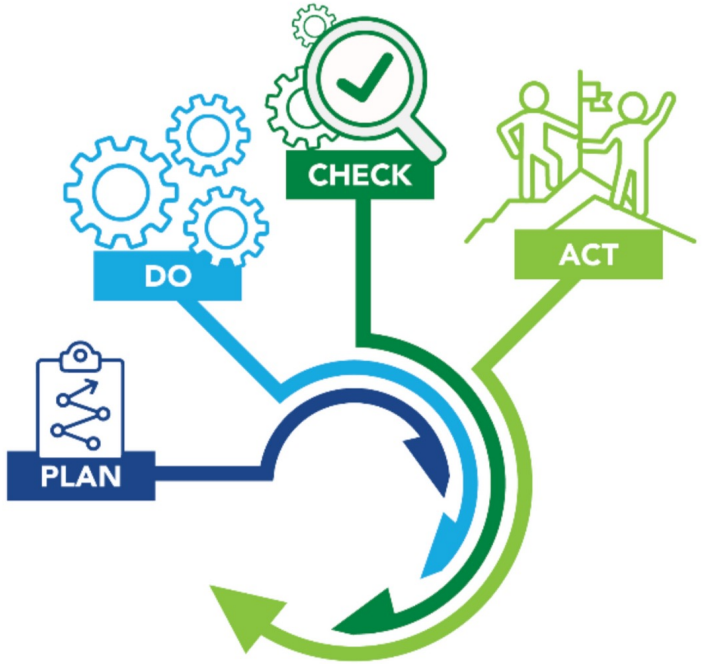
Check on how you are doing for both your EnMS and your energy performance improvement

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

Performance Evaluation (4 tasks)

When we check, if things are not okay, then we act 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?*



Overview of 50001 Ready - Guidance

Use the task completion guidance: Start with the “Getting It Done” Tab

Task 3: We have documented and approved the scope and boundaries of our 50001 Ready energy management system.

Current Task Status: **Not Started**

Not Started ✕ | In Progress | Ready For Review | Completed ✓

Your roles for this task: **Contributor** & **Approver**

Get Help

50001 Ready Help Desk

Detailed Guidance: Scope and Boundaries

Getting It Done | Task Overview | Full Description | Decarbonization | Optional Guidance | Notes 0 | Playbook | Assignments

1. Consider the strategic issues and requirements identified as part of Task 1 An EnMS and Your Organization to determine the scope and boundaries of the energy management system (EnMS).
2. Develop and document an EnMS Scope and Boundaries Statement.

Task 3 Guidance Version: **v18.03.01.02**

The creative commons license is applicable only to the technical content found in the "Getting it Done", "Task Overview", "Full Description", and "Decarbonization" tabs. The creative commons license does not extend to the 50001 Ready Navigator software or other resources.

Need assistance? Contact the 50001 Ready Help Desk Download as PDF

Overview of 50001 Ready – Cross Reference

Use the cross-reference to ISO 50001

Detailed Guidance: Scope and Boundaries

Getting It Done | **Task Overview** | Full Description | Decarbonization | Optional Guidance | Notes 0 | Playbook | Assignments

The scope and boundaries enable your organization to focus efforts and resources by defining what the EnMS includes. The scope identifies the set of activities that are included in the energy management system (EnMS), while the boundaries are the physical or organizational limits of the EnMS, commonly referred to as the "fence line" of your site. The boundaries do not have to be fixed in a physical space and could be established around a fleet of vehicles or other transportation equipment.

In the 50001 Ready Navigator the term site is used and carries the same meaning as other terms that describe the physical definitions of a space such as facility, complex, location, and campus so long as there is a relative physical proximity to the assets that will be included within the EnMS.

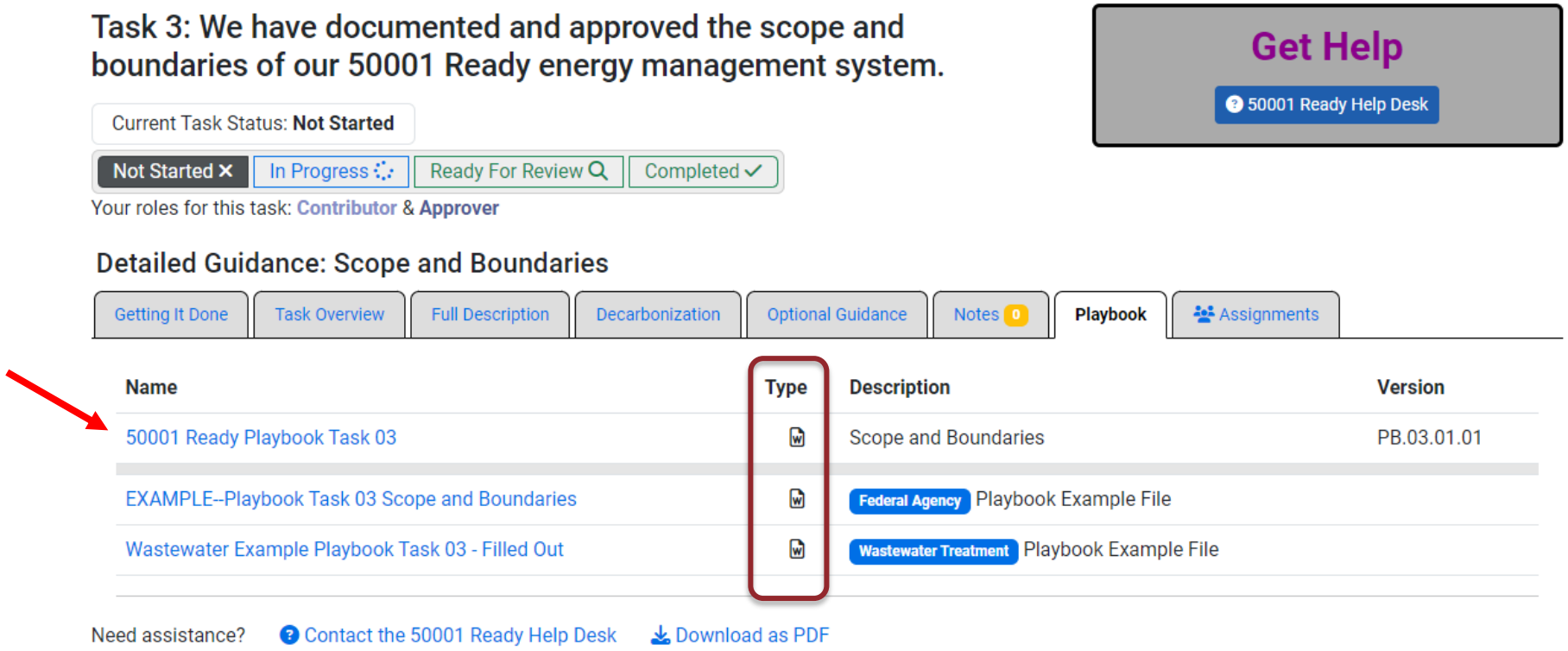
When determining the scope and boundaries strategic issues and requirements determined as part of Task 1 An EnMS and Your Organization should be considered. In addition, you should ensure that your organization has the authority to control all energy uses within the scope and boundaries, and that no energy-using equipment or systems are excluded unless they are separately metered or a dependable calculation can be made. Once the scope and boundaries are defined, an organization cannot exclude any energy sources that cross or are within the defined boundaries of the EnMS.

EnMS scope and boundaries could include any combination of physical structures: the building management operations of one or more commercial buildings at one or more specific locations; the manufacturing, warehousing, and distribution activities at a particular plant; or multiple sites of a corporation at multiple sites, to name just a few. In many cases, the scope and boundaries may only include one building or site. Top management must ensure the organization's scope and boundaries are established.

This guidance is relevant to Section 4.3 of the ISO 50001:2018 standard.

Overview of 50001 Ready – Cross Reference

Download and use the "playbook" resource for each task. These are word documents that can be filled in with your information.



Overview of 50001 Ready – New Decarb Guidance

Each of the 25 tasks will have guidance on how to **incorporate GHG management** into an EnMS.

The guidance will point out where there might be tradeoffs between energy efficiency and decarbonization goals.

Task 3: We have documented and approved the scope and boundaries of our 50001 Ready energy management system.

GHG Management Tab:

Determining the scope and boundaries for an energy management system that includes energy-related GHG emissions allows your organization to focus its efforts and resources. As described in the Task Overview, the scope identifies the set of activities that are included in the EnMS, while the boundaries are the physical or organizational limits of the EnMS.

When determining the scope, or set of activities to be included in the EnMS, organizations will need to distinguish between the various sources of direct and indirect emissions that are to be managed by the EnMS. The GHG Protocol's Corporate Accounting and Reporting Standard defines three categories, or "scopes" of direct and indirect emissions that are widely used and should be considered:[1]

- **Scope 1 Emissions: Direct GHG emissions.**
  Direct GHG emissions occur from sources that are owned or controlled by the organization, for example, emissions from combustion in owned or controlled boilers, furnaces, vehicles, etc.; emissions from chemical production in owned or controlled process equipment.
- **Scope 2 Emissions: Electricity indirect GHG emissions.**
  Scope 2 accounts for GHG emissions from the generation of purchased electricity, steam, heat, or cooling consumed by the organization. Purchased electricity is defined as electricity that is purchased or otherwise brought into the organizational boundary of the company. For purchased energy, scope 2 emissions physically occur at the facility where electricity, steam, heat, or cooling is generated.
- **Scope 3 Emissions: Other indirect GHG emissions.**
  Scope 3 is an optional reporting category that allows for the treatment of all other indirect emissions. Scope 3 emissions are a consequence of the activities of the organization, but occur from sources not owned or controlled by the organization. Some examples of scope 3 activities are extraction and production of purchased materials; transportation of purchased fuels; and use of sold products and services.

For most organizations, inclusion of scope 1 and scope 2 emissions is the minimum that should be considered when determining the EnMS scope and boundaries. However, some organizations also include scope 3 emissions within the scope of their GHG

[1] The Greenhouse Gas Protocol, A Corporate Accounting and Reporting Standard: World Business Council for Sustainable Development and World Resources Institute (https://ghgprotocol.org/sites/default/files/standards/ghg-protocol-revised.pdf)

objectives and can consider including some categories of scope 3 emissions that are energy-related in the EnMS.

Keep in mind that your organization may choose to ***manage*** some scope 3 emissions, for instance by engaging with stakeholders in the value chain, whether or not it chooses to ***report*** those emissions externally. Consider the issues and requirements identified in Task 1: An EnMS and your Organization to determine which GHG emissions categories are relevant to your organization. For instance, the decision to include various categories of scope 3 emissions in the EnMS could be due to those emissions being:

- Large relative to the organization's scope 1 and scope 2 emissions.
- Critical to key stakeholders (e.g. customers or investors)
- Ones that your organization can influence (e.g. outsourced production processes).

In setting the boundaries for the EnMS, consider the EnMS scope identified (especially for scope 3 emissions) to ensure that the boundaries include all managed emissions.

For many organizations, starting with management of scope 1 and 2 boundaries will provide ample opportunity to reduce energy-related GHG emissions.

For corporate entities, the organizational boundary addresses the variety of ownership structures a corporation could have, including wholly owned operations, incorporated and unincorporated joint ventures, subsidiaries, and others. Chapter 3 of the GHG Protocol's Corporate Accounting and Reporting Standard provides guidance on the use of two distinct approaches to define organizational boundaries for the purpose of accounting for GHG emissions:

- Equity share approach: A company accounts for GHG emissions from operations according to its share of equity in the operation.
- Control approach: A company accounts for 100 percent of the GHG emissions from operations over which it has control.

Corporate entities should review this document to better understand corporate GHG emissions accounting practices.

If you have an existing 50001 Ready-based EnMS and want to adapt it to manage energy-related GHG emissions, you should:

1. **Review your existing scope**. Consider whether your organization will manage energy-related scope 1 and scope 2 emissions and which, if any scope 3 emissions it will include. Make sure the scope reflects the issues and requirements identified when updating Task 1: An EnMS and Your Organization for GHG emissions. Update your scope as needed.

Overview of 50001 Ready – Goals & Recognition

STEP 1
Complete the 25 tasks in the 50001 Ready tool

STEP 2
Prepare your signed self-attestation form

STEP 3
Determine your energy performance improvement

STEP 4
File for 50001 Ready recognition

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DOE Recognizes
50001 Ready Completion

50001 Ready Site 2022
U.S. DEPARTMENT OF ENERGY

Company Name

Is recognized as an Energy Management Leader for instituting DOE's 50001 Ready program across its [Facility] in [location]

UNDER THE LEADERSHIP OF

Facility Level Energy Manager
Corporate (or Agency) Energy Manager

Recognized [or if re-attested since YYYY of initial recognition]
by the United States Department of Energy

[Date of certificate issuance]

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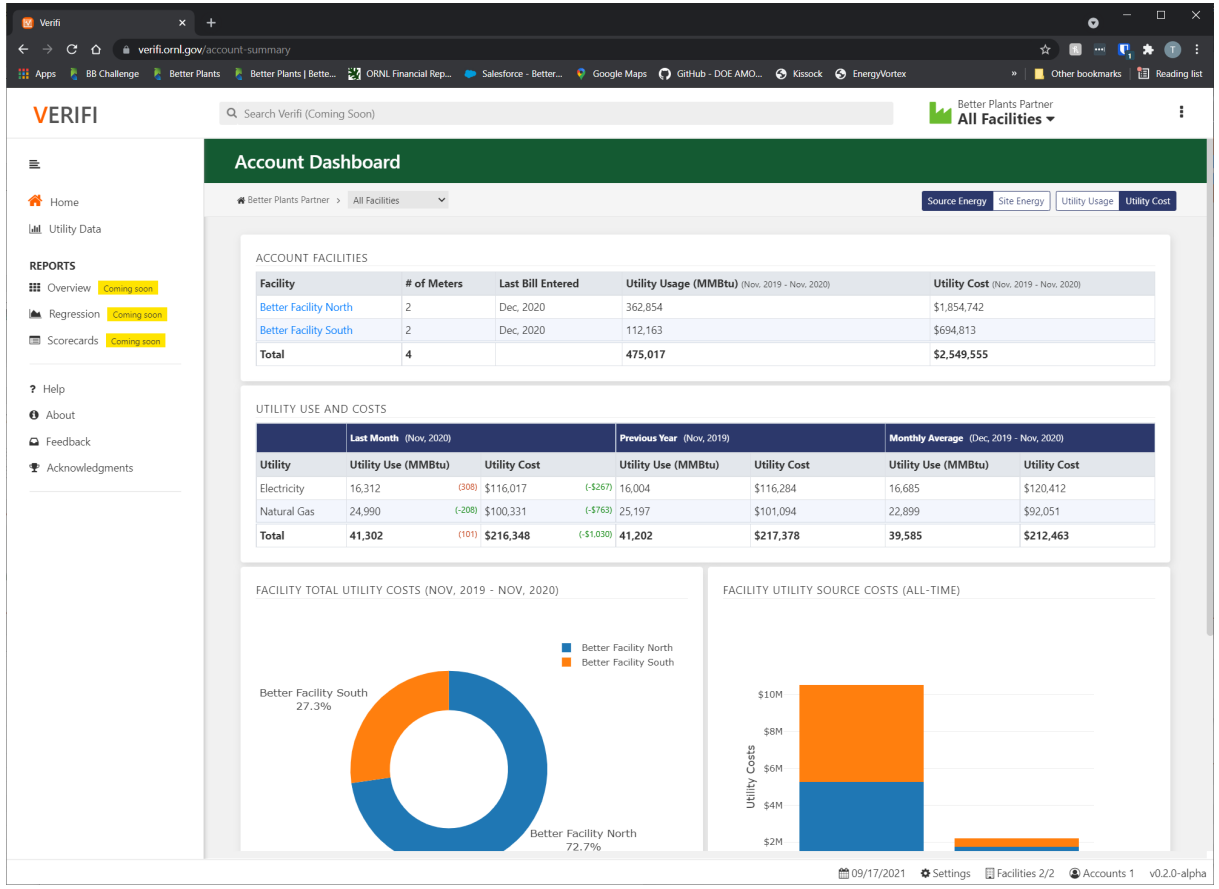
Overview of 50001 Ready – Determining Performance

Additional Support Tools: **VERIFI**

- Allows users to manage all energy and carbon utility-level data
- Users can create facility or corporate level dashboards
- Track energy performance of facilities
  - Includes top-down regression analysis calculates energy change from baseline year
- Provides users with a variety of customizable reporting options (Better Plants, 50001 Ready, SEP, etc)

50001 Ready will accept Better Plants Performance data analysis!



A Pathway to Meet **YOUR** Organizations Goals

	50001 Ready U.S. DEPARTMENT OF ENERGY	ISO	Superior Energy Performance U.S. DEPARTMENT OF ENERGY
	SELF ATTEST	**CERTIFY**	**VERIFY**
Tasks Associated	• Complete 25 steps in Navigator • Self-attest to completion • Report energy performance	• ANAB-accredited audit • Receive certification from the certification body	• ISO 50001 certification • 3rd party SEP Performance Verification audit
Time Req.	Flexible	12-18 months	12-18 months

50001 Ready is part of a Pathway toward ISO 50001 Certification and (if desired) validated energy savings in SEP

Support

- Navigator Tutorials
  - Within Navigator at Each Step
- Better Plants Technical Account Manager
- DOE 50001 Ready Cohorts
- Local Utility Programs (Region dependent)

Summary Overview of 50001 Ready

Utilities

DOE Programs

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Superior Energy Performance
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CWB

DEKRA

Verification Body Partners

YOUR ORGANIZATION

SEM/ISO/SEP Consultants

DOE Resources

Energy Tools

Training Partner

Georgia Tech Enterprise Innovation Institute

Survey Says…..

4 out of 5 energy consultants surveyed* recommend you use

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To prevent this from happening to your energy team

*No actual survey was taken. This is just used to make a point.

Questions?

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