Applying ISO 50001 and 50001 Ready for Strategic Energy Management (SEM)

Tuesday, August 17, 2021

6:00 p.m. - 7:00 p.m.

A *50001 Ready* Overview

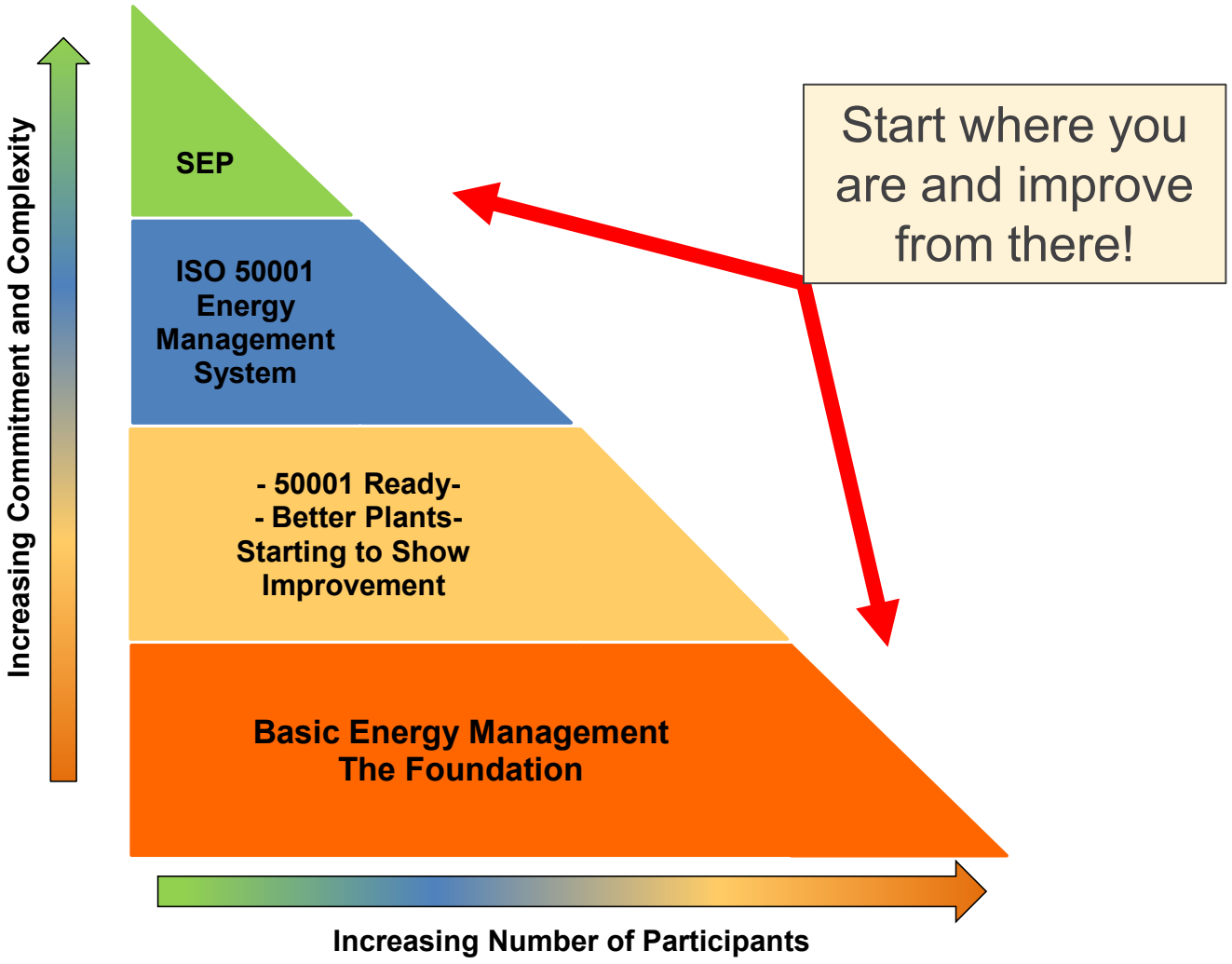
ncaee®

North Carolina Association of Energy Engineers

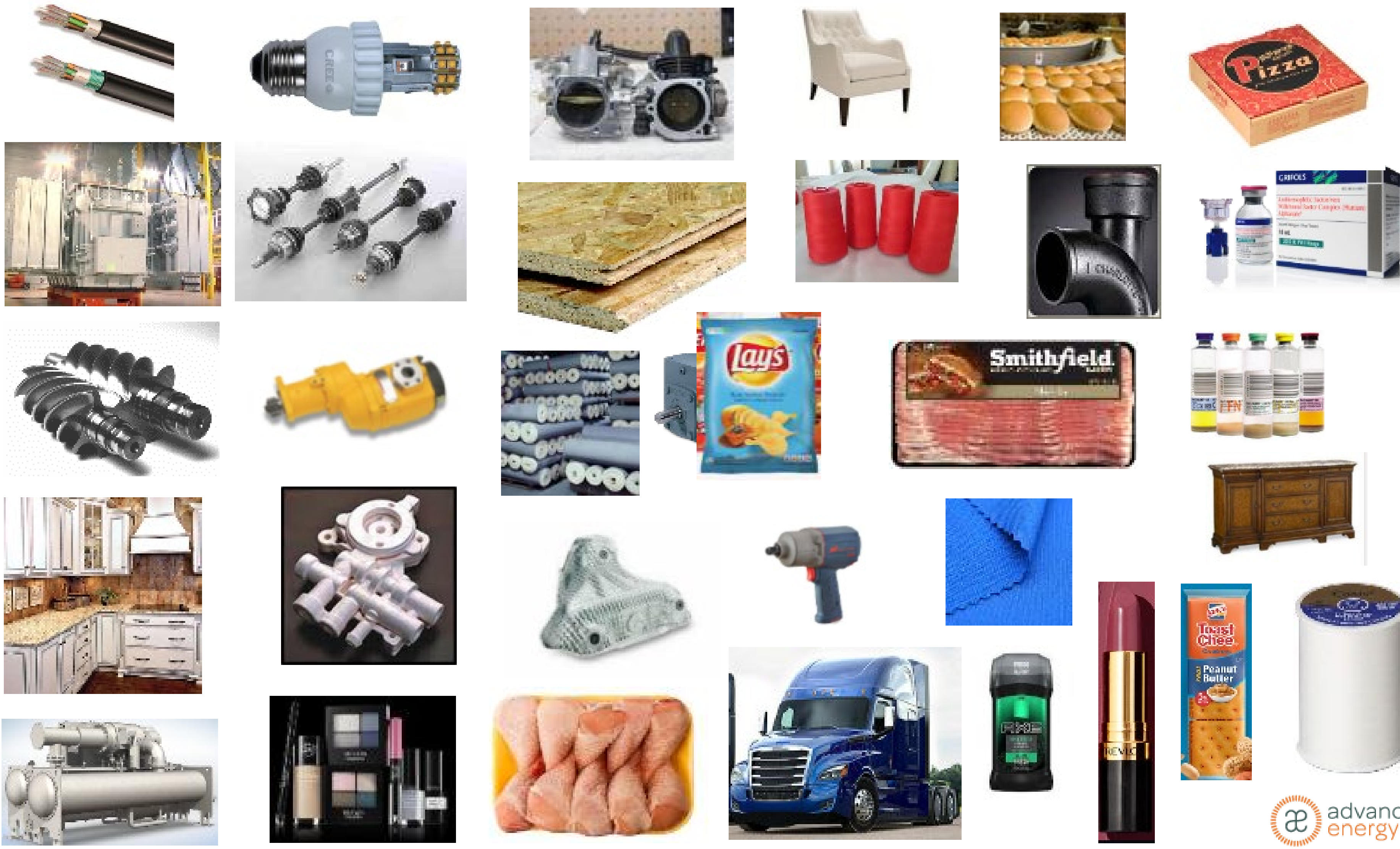
Topics and Learning Objectives

- Why Strategic Energy management (SEM)?
  - The SEM Continuum
- Why 50001 Ready?
  - The business case
- Overview of the 50001 Ready Navigator Tool
  - The system
  - The 25 tasks
  - The seven sections
  - A look inside 50001 Ready
  - Resources
  - Recognition
- 50001 Ready and the Cohort Model

Why SEM? - The Continuum



Why SEM? - Made in NC



advanced energy

Why SEM: Transformation Takes Energy

Transformation examples:



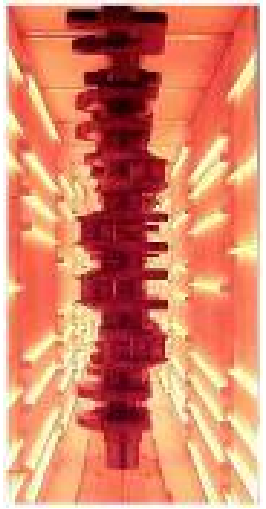






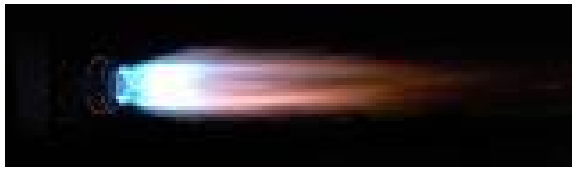
Why SEM? There is a lot of “E”

- 33.63 Quadrillion BTUs



- Make more with less
  - Lean Principles

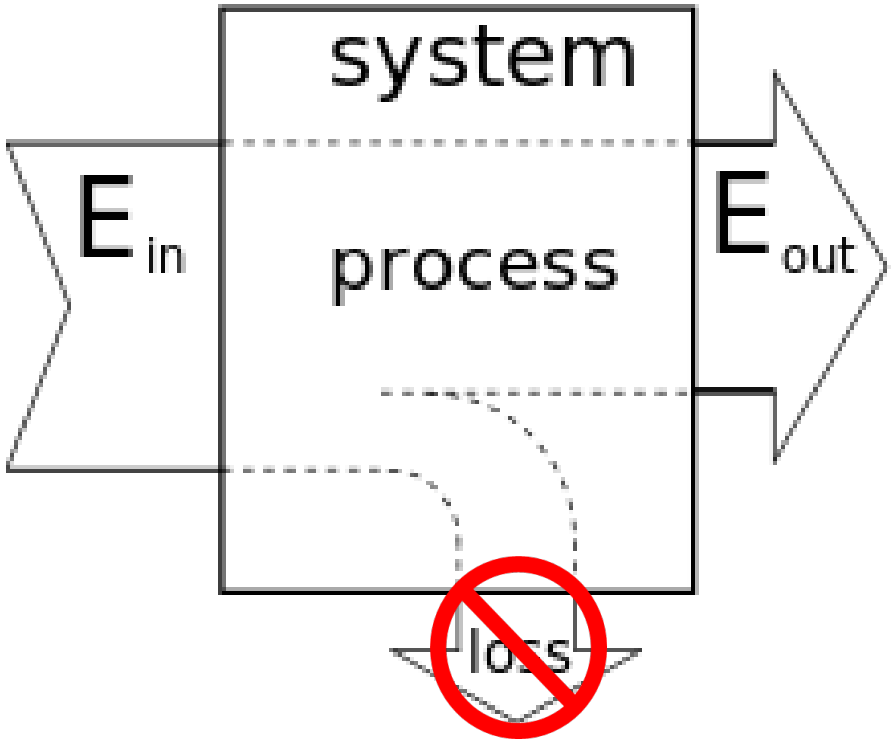
- Reduce energy intensity
  - LESS MMBTU/ton
  - LESS MMBTU/linear yard
  - LESS MMBTU/widget



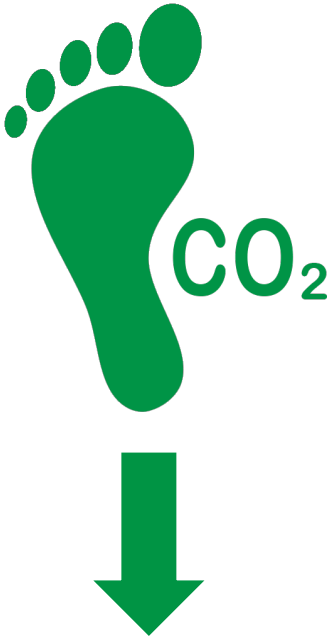
Why SEM? - Energy Efficiency

- Make MORE with LESS:

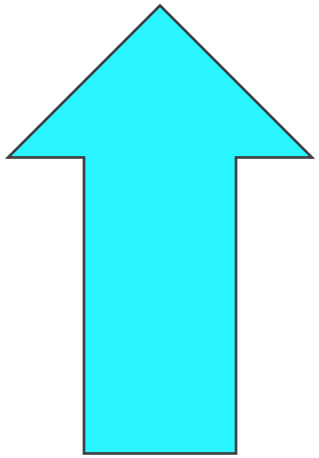
This is what you pay for



This is adding value



Why SEM? – EE & EI



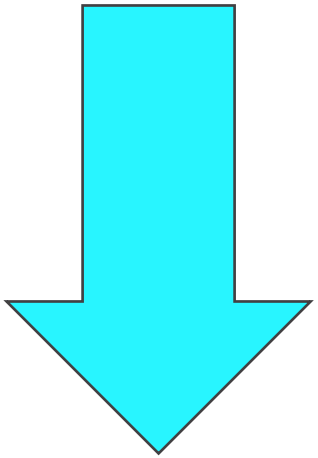
INCREASE Energy Efficiency (EE)

TO

REDUCE Energy Intensity (EI)

&

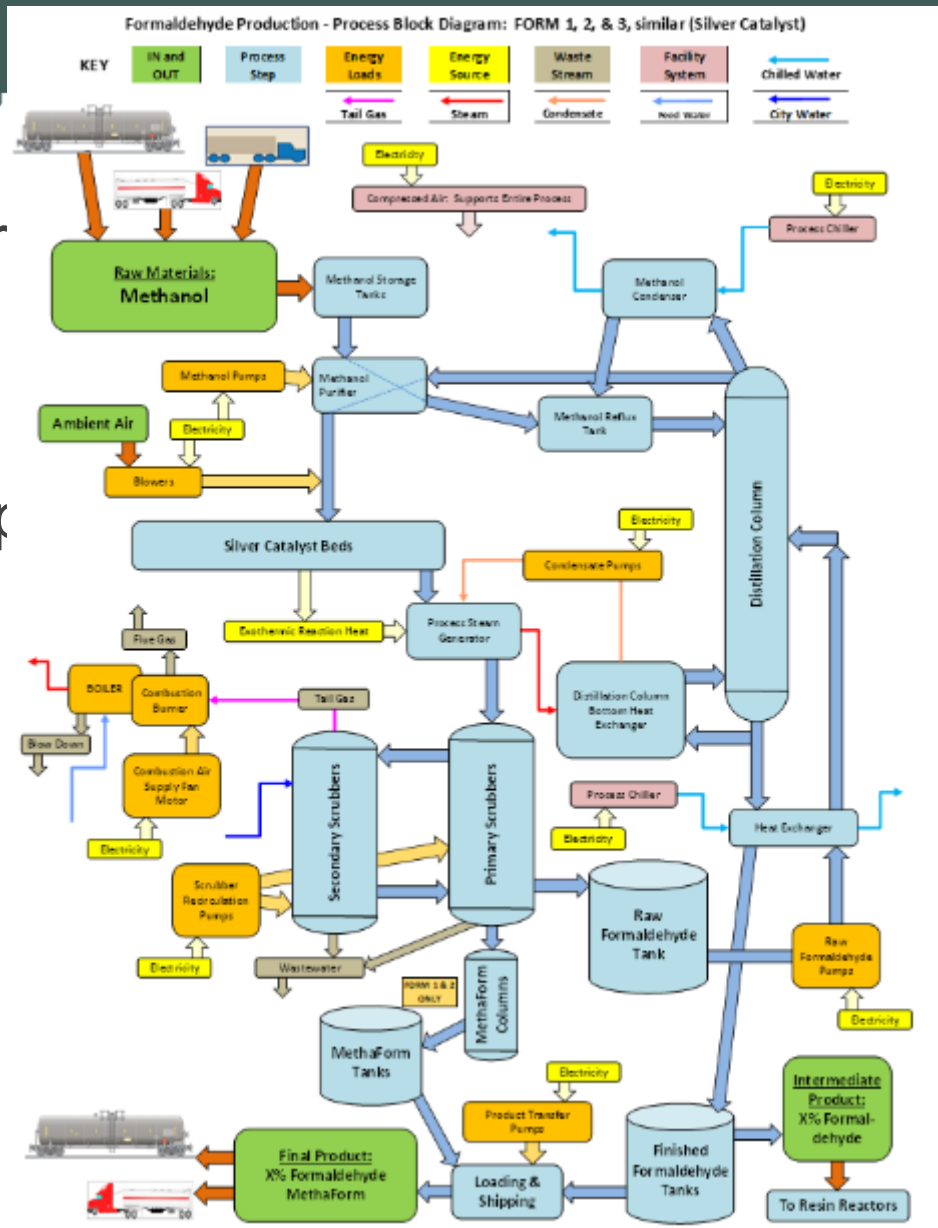
REDUCE Energy Costs $$$



Why SEM? - Process Block Diagram

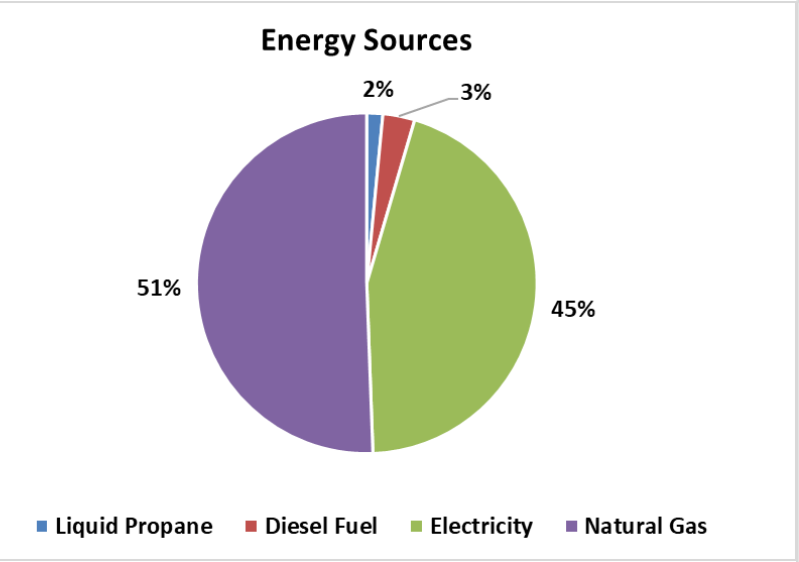
Using the process block diagr

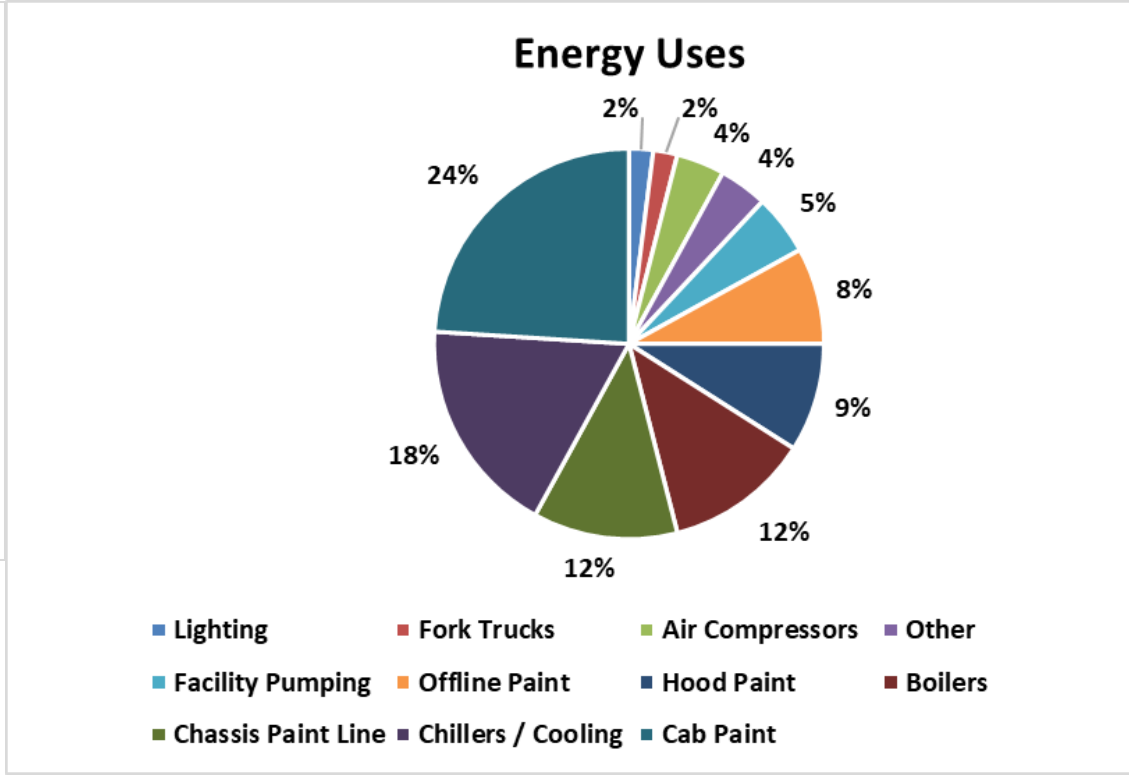
- Energy sources
- Significant energy users
- Process versus Facility Sup
- Intermittent loads
- Operational parameters



Why SEM? – Two Key Pie Charts

Understanding your energy consumption





What energy comes into my site?
Where does all this energy go?

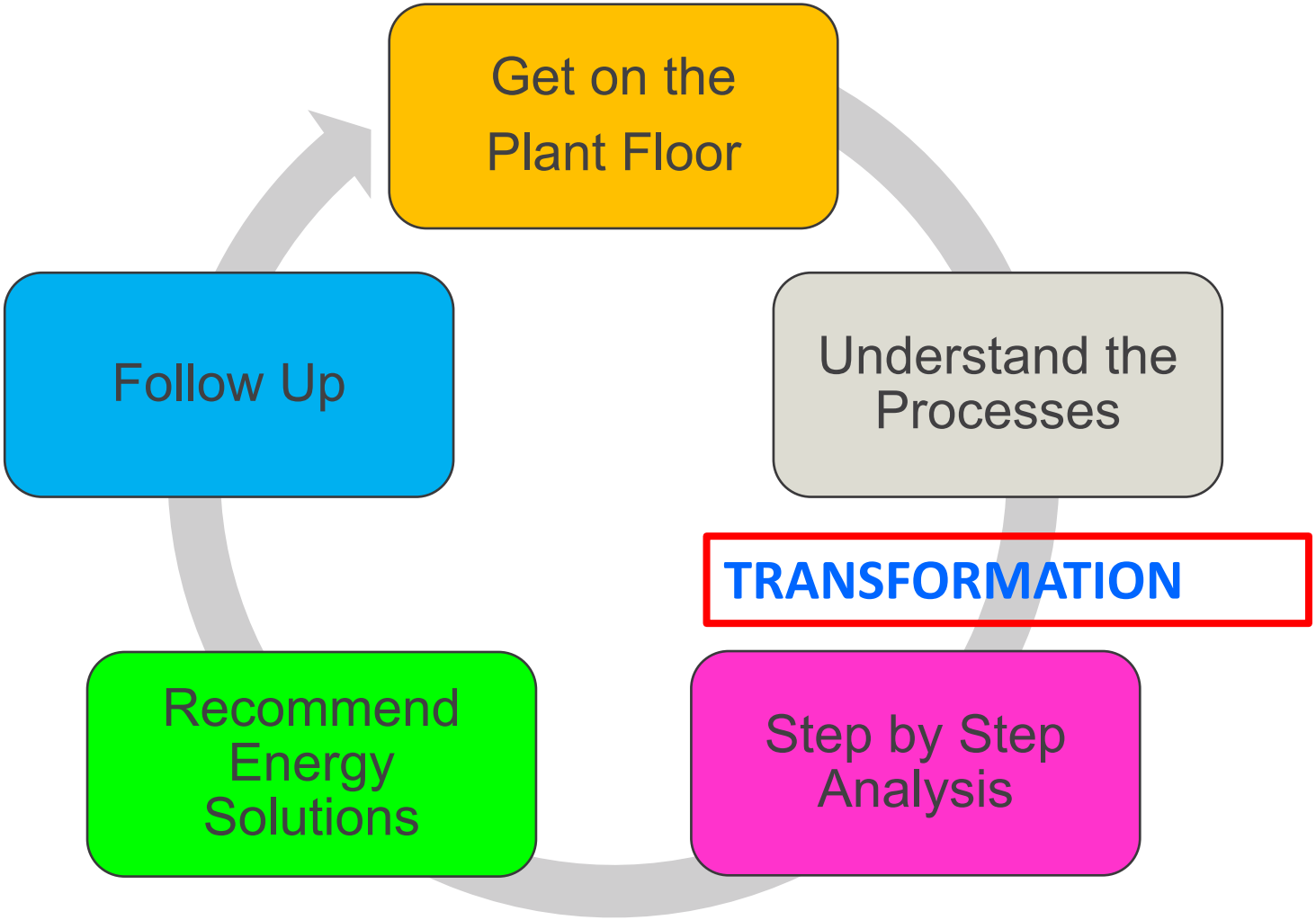
advanced energy

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

Why SEM? - Continual Improvement



SEM and Carbon Reduction

- Goals to 

lead organizations to SEM

AND

- SEM leads organizations to 

50001 Ready
U.S. DEPARTMENT OF ENERGY provides a pathway to achieve BOTH!

advanced energy

Why 50001 Ready? - Background

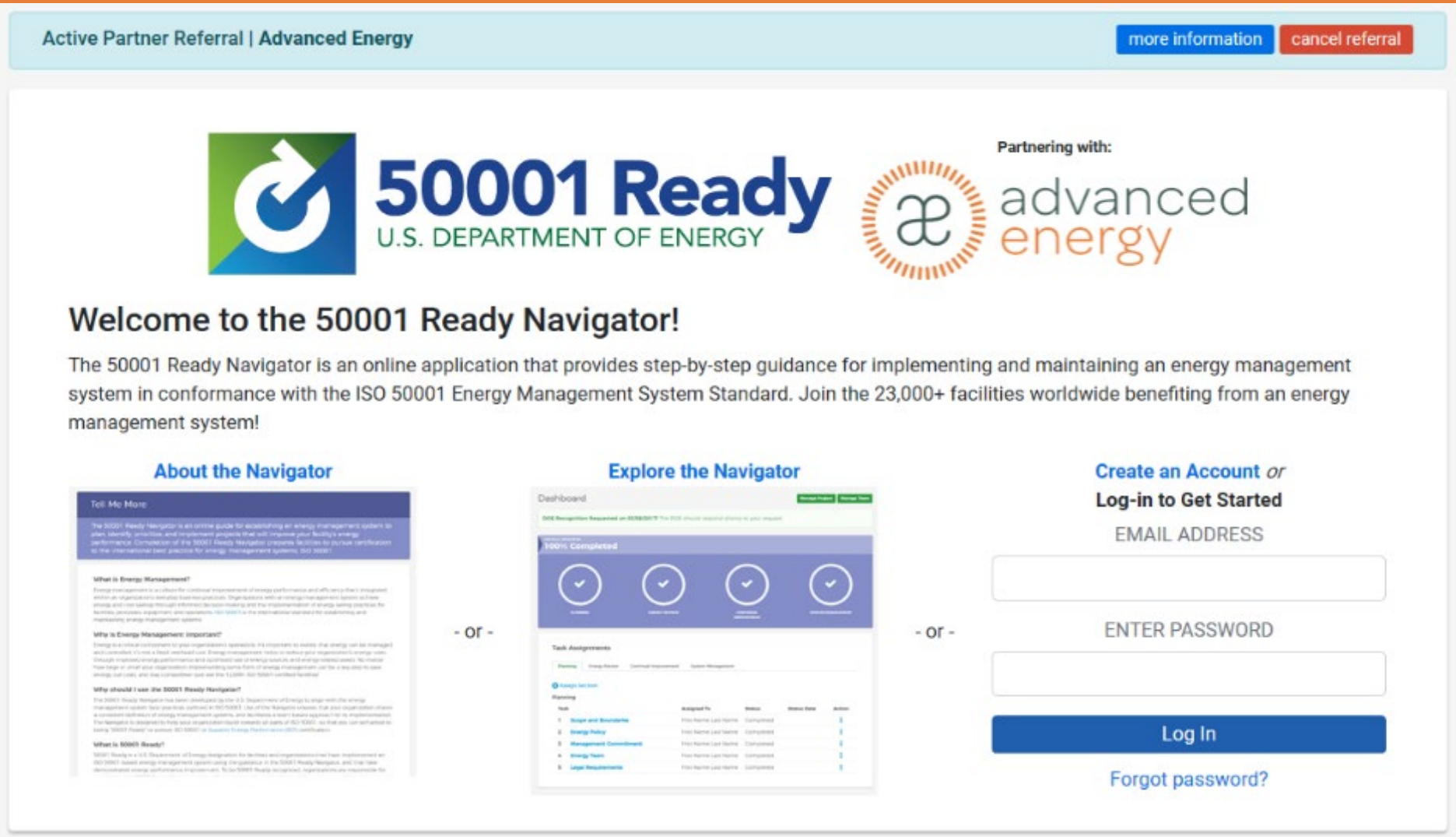
- *50001 Ready* is a recognition program based on the ISO 50001 Standard

ISO International Organization for Standardization

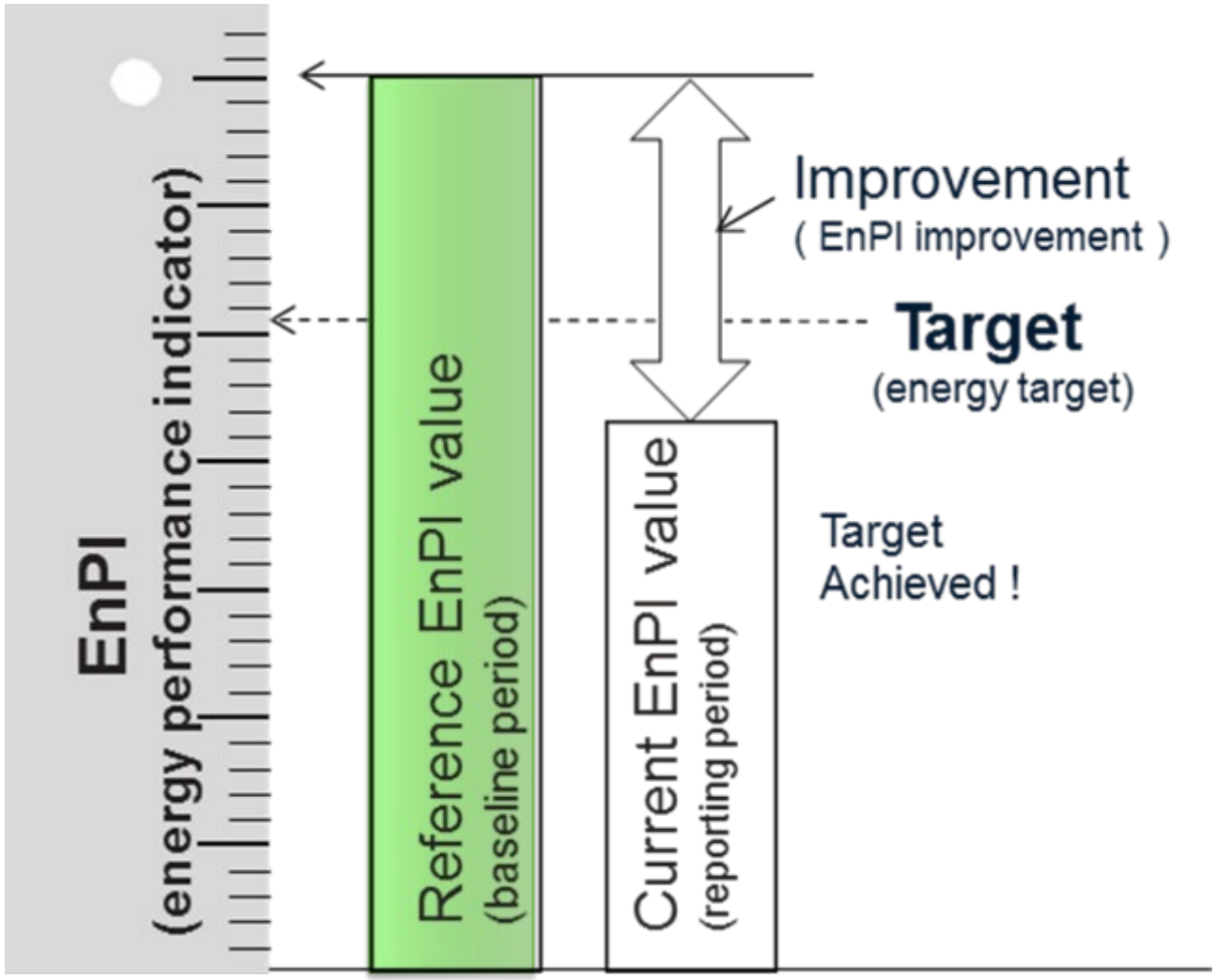
50001 Ready
U.S. DEPARTMENT OF ENERGY

advanced energy

Why 50001 Ready? – A System



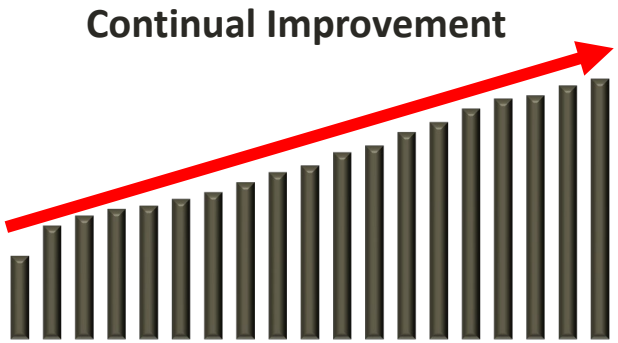
Why 50001 Ready?: Goal Oriented



advanced energy

Why 50001 Ready? – Proven Results

- Companies with a formal SEM system have better energy performance improvement:
  - Schneider Electric
    - 19% average improvement with SEM
    - Versus 11.5% without
  - 3M
    - 10.5% average improvement with SEM
    - Versus 6.5% without



Energy & Cost Savings Over Time

- 50001 Ready will help formalize you SEM

Why 50001 Ready? – A Pathway

50001 Ready is part of a Pathway toward ISO 50001 Certification and (if desired) Validated Energy Savings in SEP

advanced energy

Why 50001 Ready?: Leverage

Previous experience with other ISO management systems is a plus:

- ISO 9001 for Quality
- ISO 14001 for Environmental
- OSHAS 18001, now ISO 45001: for Occupational Health and Safety

…but <u>not</u> a requirement.

50001 Ready supports starting from scratch also.

advanced energy

Why 50001 Ready? – Key Items

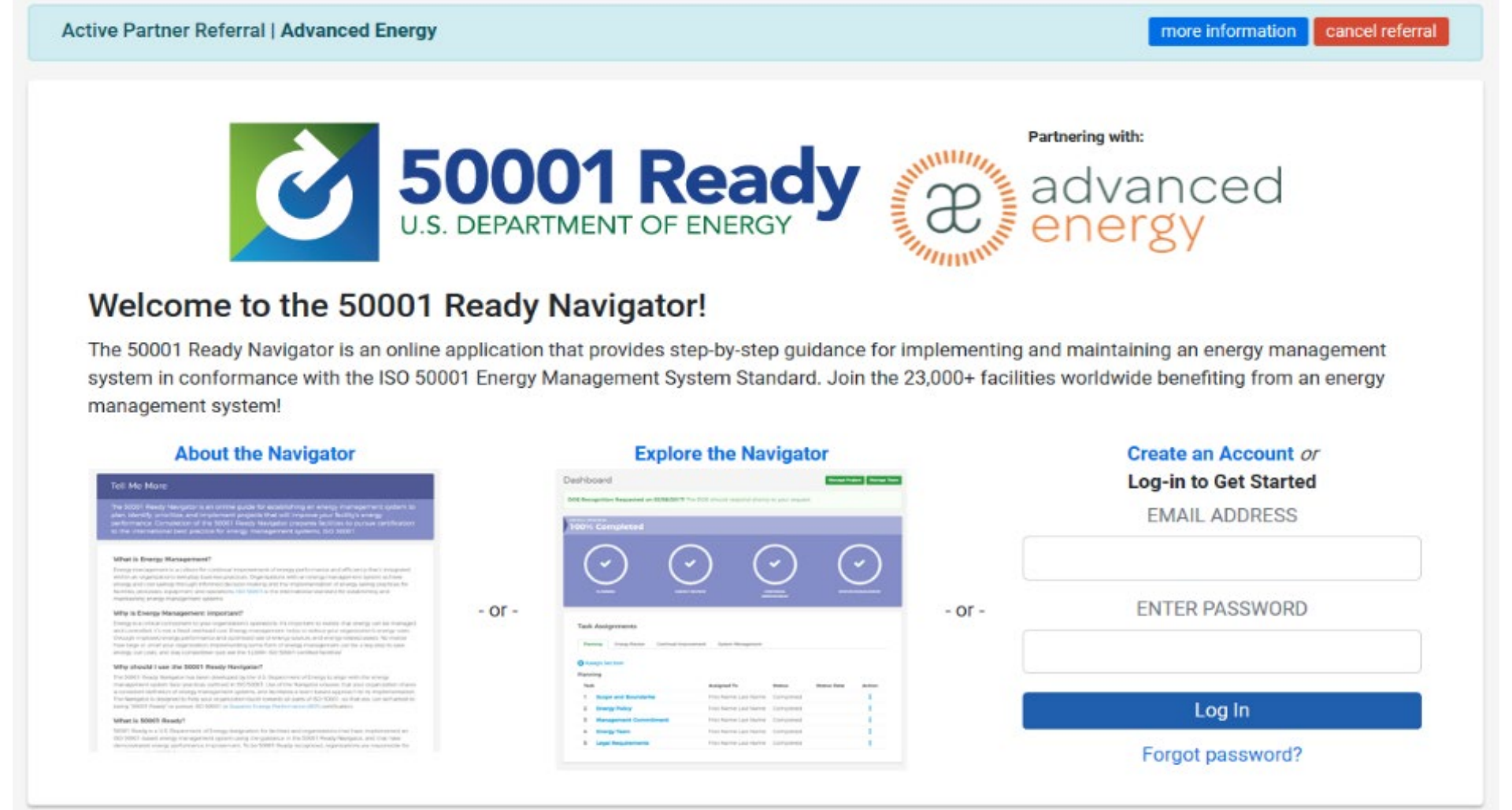
- Continual Improvement - similar to Lean, Kaizen, 6 Sigma
- Company Culture Impact - Involves everyone in energy
- Commitment - Leadership driven, resources provided
- Data Driven - Collection & analysis of energy performance info
- Performance Driven – Actual improvement is required
- Adds Value - Incorporates energy decisions into all operations

Why 50001 Ready?

- Practical
- Implementation focused
- User friendly
- Data driven
- Performance based
- An alternative to certification
- 25 tasks to guide efforts
- Dashboard tracking
- Excellent integration with other ISOs
- Great resources
- Self attesting
- Lots of FREE support
- Continual improvement
- Leverage

advanced energy

The 50001 Ready Navigator



advanced energy

Overview of 50001 Ready - The Tool

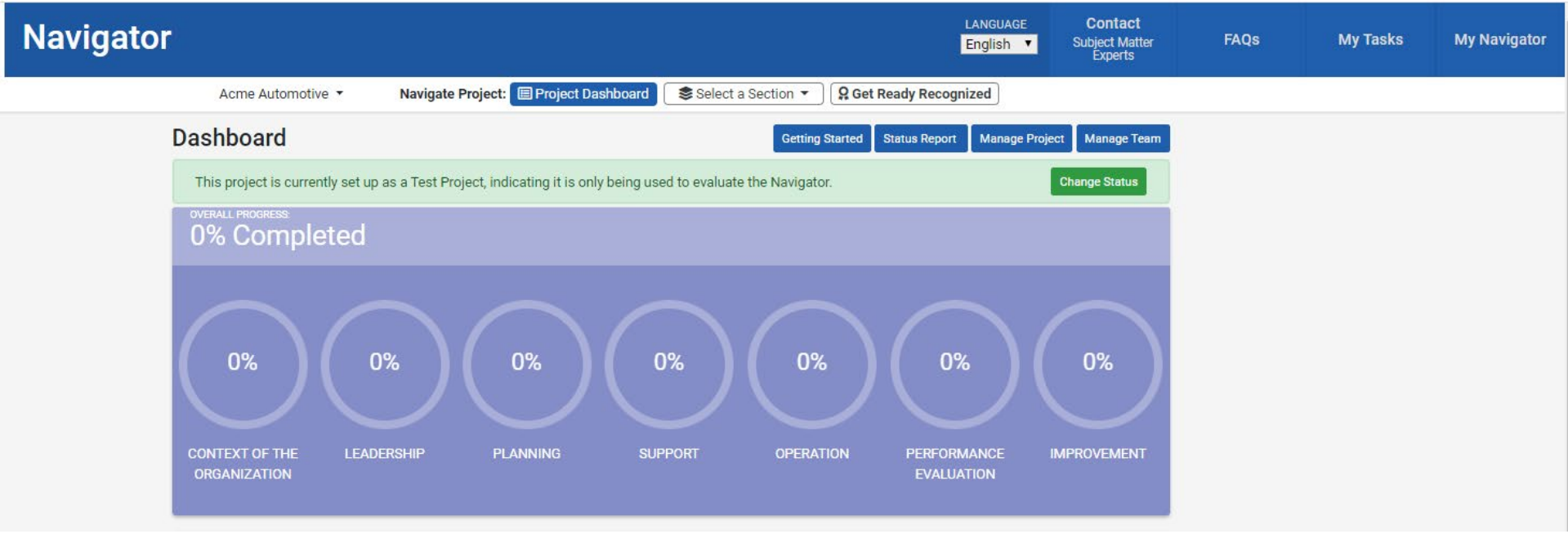
1. Recognition for self-attesting to implementation of an EnMS based on the structure of ISO 50001
2. No certification required from third-parties
3. Open-source software tools, designed to be adopted by implementers
4. Suite of resources to support continual improvement in institutional, commercial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

50001 Ready
U.S. DEPARTMENT OF ENERGY

advanced energy

Overview of 50001 Ready - Dashboard

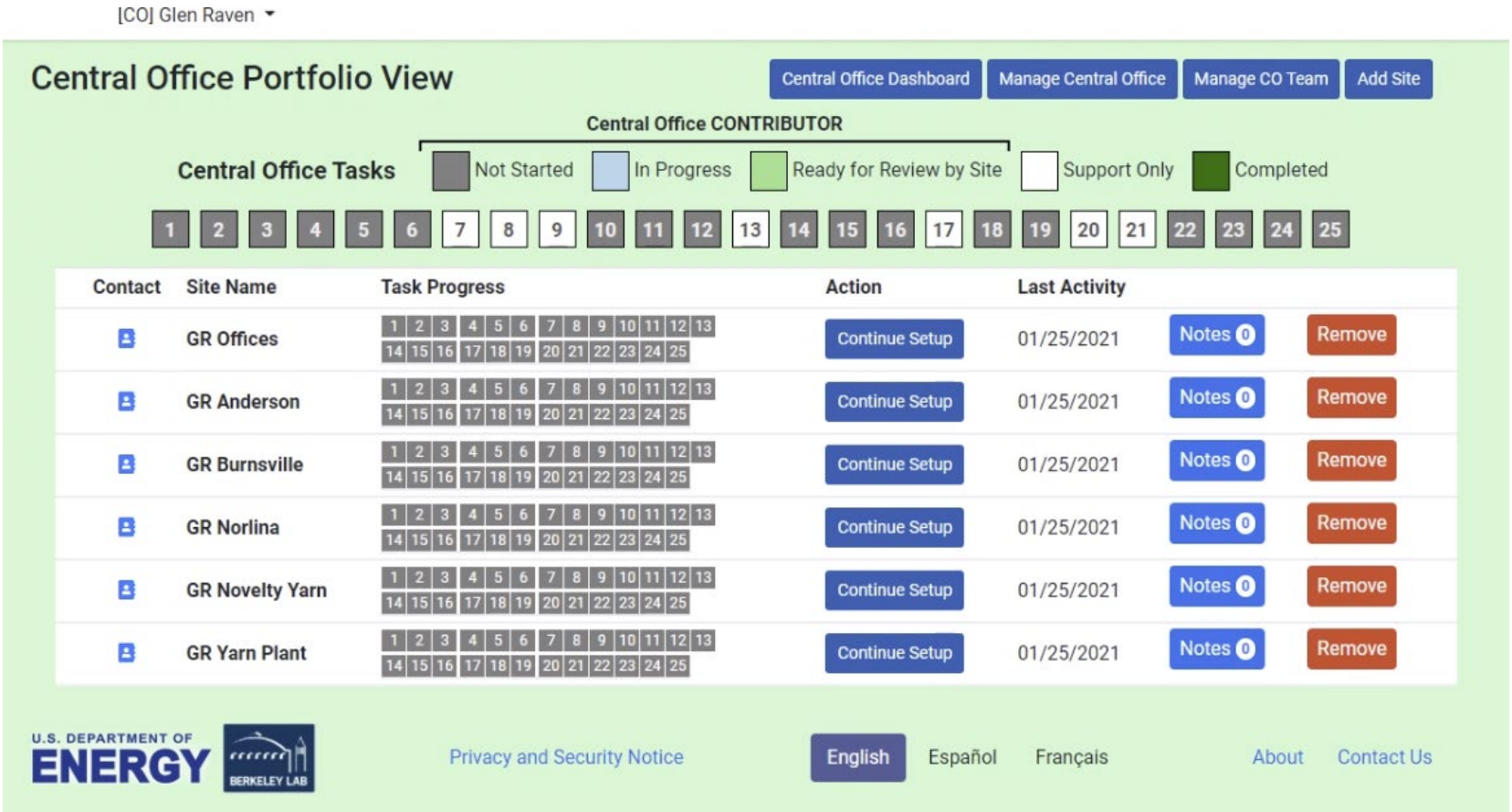
50001 Ready is an online, web-based 25 task process for energy management



advanced energy

Overview of 50001 Ready - Multisite

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



advanced energy

50001 Ready Navigator Tasks

Context of the Organization	Leadership	Planning	Support	Operation	Performance Evaluation	Improvement
1. An EnMS and your Organization 2. People and Legal Requirements 3. Scope and Boundaries	4. Management Commitment 5. Energy Policy 6. Energy Team and Resources	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	14. Competence and Training 15. Awareness and Communication 16. Documenting the EnMS	17. Operational Controls 18. Energy Considerations in Design 19. Energy Considerations in Procurement	20. Monitoring and Measurement of the EnMS 21. Monitoring and Measurement of Energy Performance Improvement 22. Internal Audit 23. Management Review	24. Corrective Action 25. Continual Improvement

50001 Ready
U.S. DEPARTMENT OF ENERGY

advanced energy

Context of the Organization (3)

1) Building a foundation for your EnMS

Regarding my EnMS, what are the:

- *Risks, opportunities and strategic issues;*
- *Legal and other requirements;*
- *Interested parties;*
- *Scope and boundaries?*

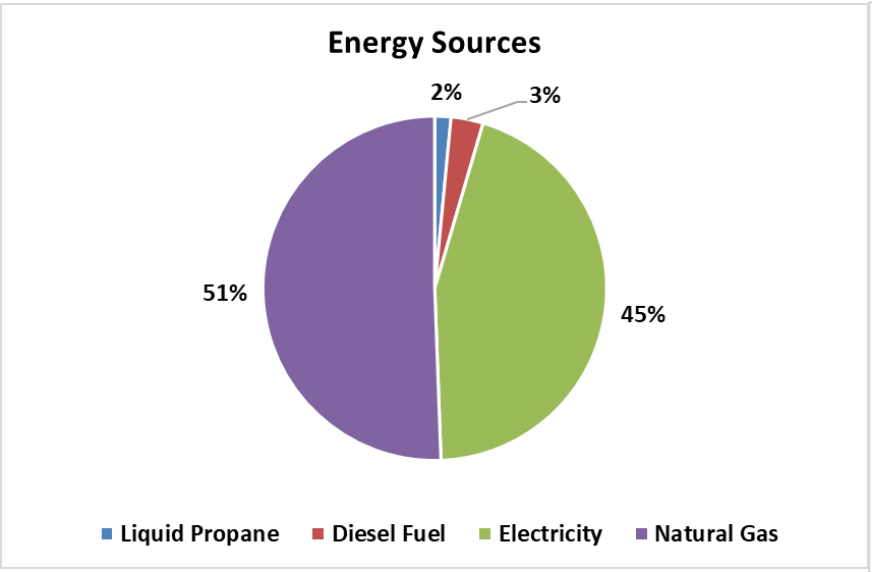
Leadership (3)

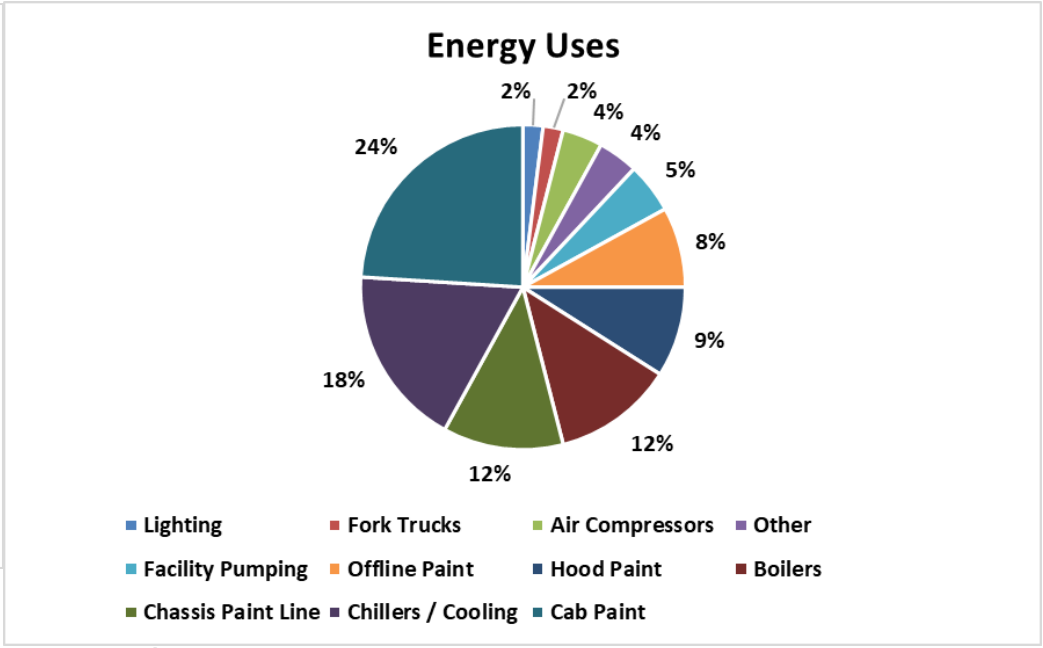
2) Commitment and guidance from the top

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) – Two Key Pies

3) Understanding your energy performance

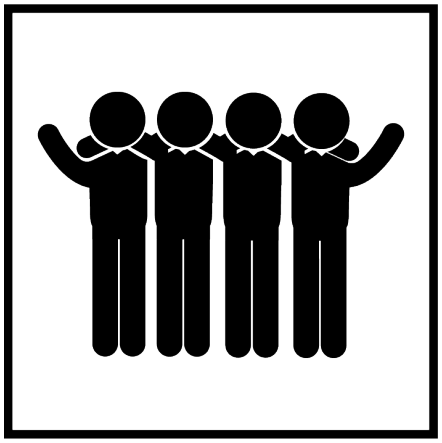




What energy comes into my site?
Where does all this energy go? [SEUs]
What are my EnPIs and EnBs?
What are my objectives, energy targets & action plans?

Support (3)

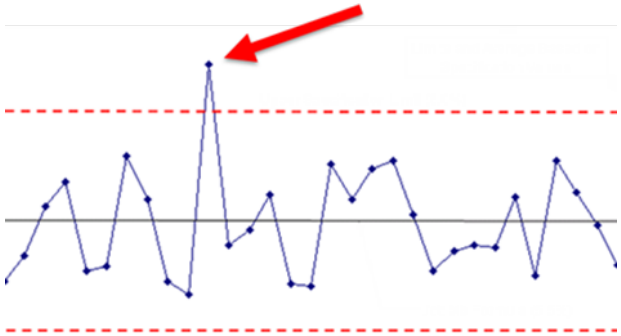
4) Ensure all team members who impact energy performance understand their roles



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)

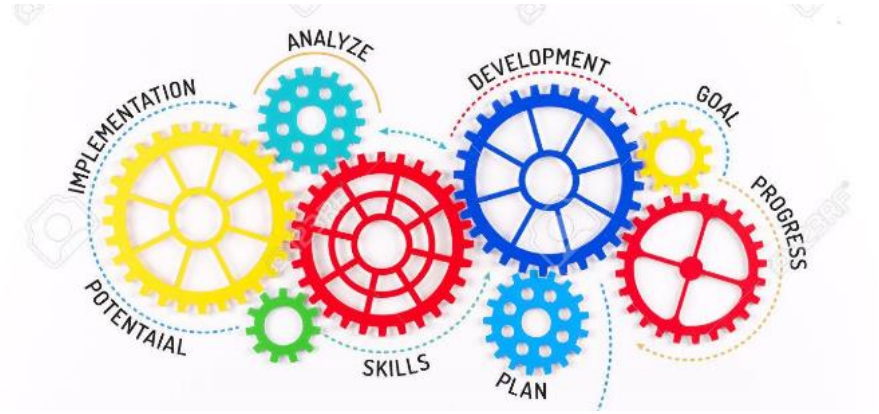
5) Operate, maintain, design, and procure to optimize energy performance



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)

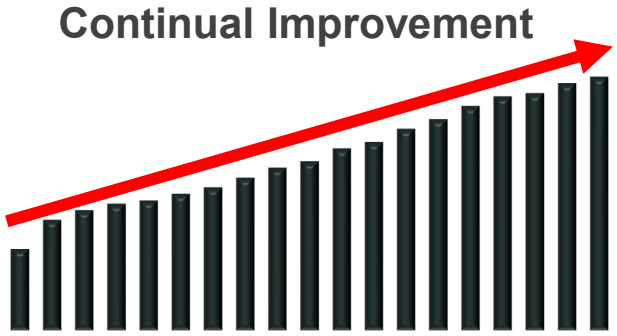
6) Check on how you are doing for both your EnMS <u>and</u> your energy performance improvement



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?

Continual Improvement (2)

7) When we check, if things are not okay, then we act to fix them, and we do this in an ongoing method



Energy & Cost Savings Over Time

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?

Activity: Walkthrough of the 50001 Ready Navigator

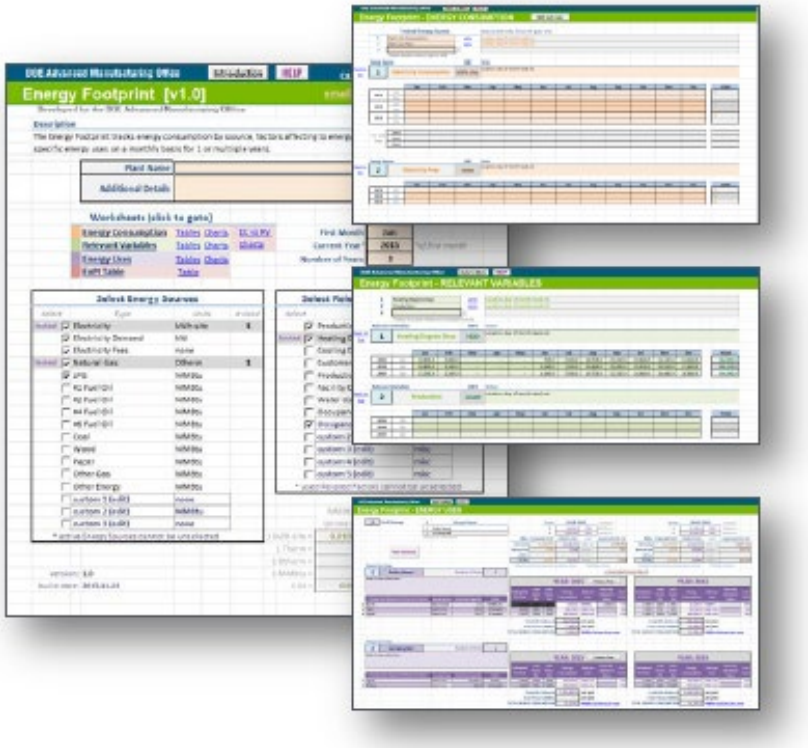
- Creating an account
- Creating a project and the multi-site function
- Explore the 50001 Ready Navigator
  - My Navigator Pull Down Menu
  - FAQs
  - Review the tabs on the tasks
  - Review playbooks
  - Notes, history and assignments tabs
  - Updating your site task status
  - Help

Overview of 50001 Ready - Measured

Must measure energy performance for 50001 Ready recognition

Overview of 50001 Ready - Resources

Energy Footprint Tool



Easily track and analyze:

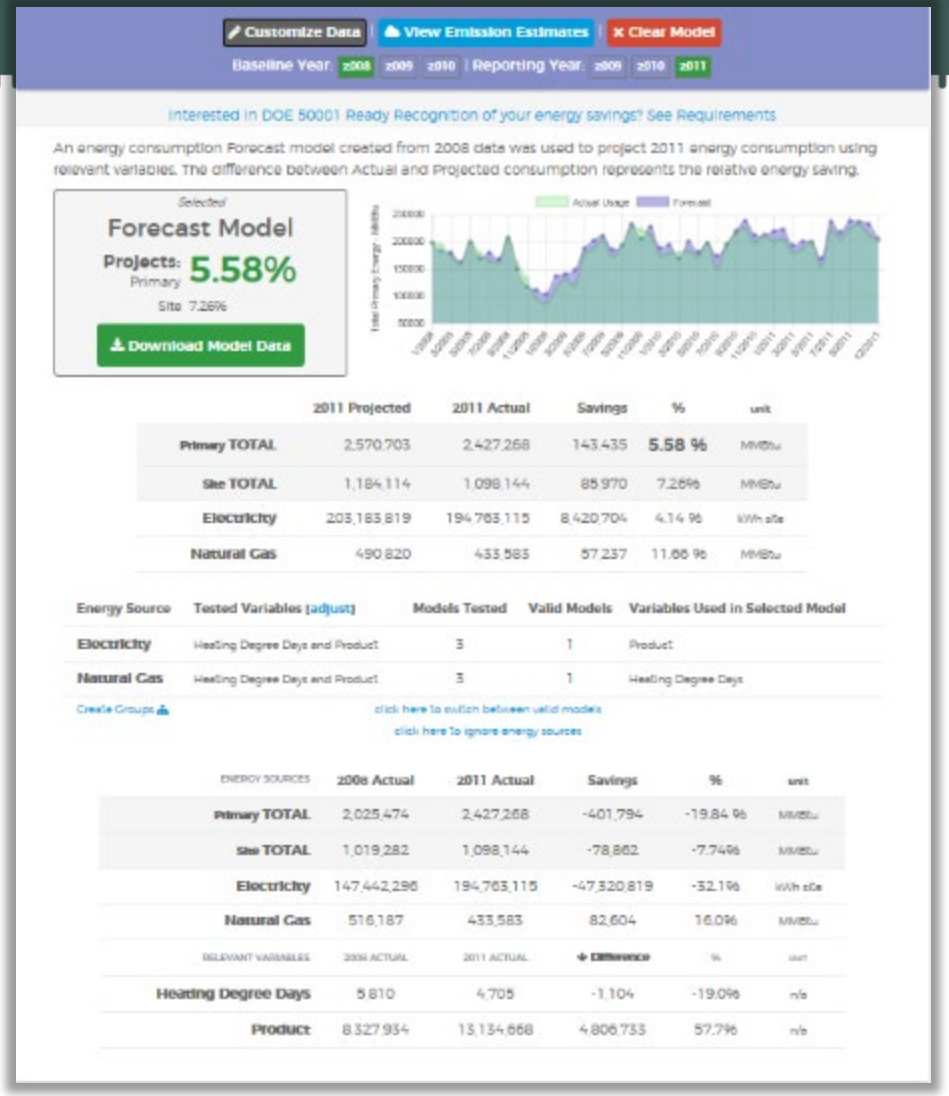
- Energy consumption
  Electricity, natural gas, etc.
- Relevant variables
  Production levels, degree days, operating hours, occupancy rates, etc.
- Energy Uses
- Calculates energy-related greenhouse gas emissions
- Easily exports to DOE EnPI Tool

Overview of 50001 Ready - Resources

EnPI Lite

Navigator's companion online tool for facility-level energy performance

- Enter or upload energy use data and relevant variables
- Top-down regression analysis calculates energy change from baseline year
- Accepts input from DOE Energy Footprint tool and ENERGY STAR Portfolio Manager
- The EnPI Lite Output file is one option for reporting energy performance for DOE recognition



advanced energy

Overview of 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

Overview of 50001 Ready - Outcomes

- Gain an understanding of ISO 50001
- Use the *50001 Ready* navigator tool to complete the 25 tasks
- Gain DOE recognition for self-attesting to completion
- Increase energy performance improvement!
- Improve overall plant operations

50001 Ready
U.S. DEPARTMENT OF ENERGY

advanced energy

Overview of 50001 Ready –Recognition

STEP 1
Complete the 25 tasks in the 50001 Ready tool

STEP 2
Prepare your signed self-attestation form

STEP 3
Determine energy performance improvement

STEP 4
File for 50001 Ready recognition

DOE Recognizes 50001 Ready Completion

Overview of 50001 Ready – Summary

- To paraphrase, *50001 Ready* puts the Plan, Do, Check, Act process into simple, clear steps:
  - Say what you will do (PLAN)
  - Do what you said (DO)
  - Verify that you did it (CHECK)
  - Review and improve it (ACT)

What is a Cohort Anyway?

COHORT: /ˈkōˌhôrt/

1) An ancient Roman military unit, comprising six centuries, equal to one tenth of a legion
2) A group of people banded together or treated as a group

NISSAN	Smyrna, TN	17.7%
HARBEC	Ontario, NY	16.5%
Cummins	Whitakers, NC	12.6%
Coca-Cola	Dunedin, FL	12.2%
GENERAL DYNAMICS	Scranton, PA	11.9%
BRIDGESTONE Your Journey, Our Passion	Wilson, NC	15.1% / 10 yrs
OLAM	Gilroy, CA	9.8%
MedImmune A member of the AstraZeneca Group	Gaithersburg, MD	8.5%
CURTISS WRIGHT	Cheswick, PA	7.6%
LAND O'LAKES	Carlisle, PA	5.7%

What is a Cohort Anyway?

- Five to seven companies with similar SEM goals and experience levels
- Ideally, non-competing companies
- Willing to openly share info and best practices
- STRONG management commitment is essential
  - Allow time for participation
  - Allow time for homework
  - Provide resources needed to succeed
  - Provide resources for travel to trainings

advanced energy

What is a Cohort Anyway?

- Previous experience with other ISO management systems is a plus, but is not required:
  - ISO 9001 for Quality
  - ISO 14001 for Environmental
  - OSHAS 18001, now ISO 45001: for Occupational Health and Safety

I am in a Cohort, Now What?

- What participants will RECEIVE:
  - Kick-off cohort **webinar** to include:
    - Cohort introductions
    - The business case for SEM
    - Who, what, where, why and when of the program
    - Initial homework assignments
    - A list of things to download, review, and gather
    - Review of roles and responsibilities
    - Goals and desired outcomes

I am in a Cohort, Now What?

- What participants will RECEIVE (continued):
  - **Eight full-cohort webinar sessions**
    - Review the fundamentals of ISO 50001 and the Plan, Do, Check, Act (PDCA) model
    - Demonstration of the basics of the *50001 Ready* navigator
    - Review the available tools associated with the *50001 Ready* navigator
    - Work through the 25 tasks in the *50001 Ready* navigator

I am in a Cohort, Now What?

- What participants will RECEIVE (continued):
  - Homework assignments and session preparations
  - Monthly check in calls with each company site
    - One on one
  - Example playbooks
  - Technical assistance with tools and resources

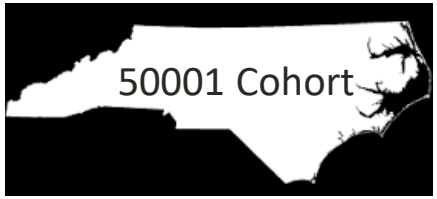
I am in a Cohort, Now What?

- What participants are expected to PROVIDE:
  - Attendance at all events
  - Proper preparation for all events
  - Proper completion of homework
  - Set up a *50001 Ready* account
  - Download the tools
  - Play with the tools
  - Gather and provide data
    - Monthly consumption for ALL site energy sources
    - Monthly production data (pounds, gallons, widgets, etc.)

advanced energy

Current Cohort Opportunities

- Local North Carolina cohorts
  - *Utility funded*
  - *Typically, one and possibly two per year*



- Department of Energy, Advanced Manufacturing Office 50001 Ready Implementation Cohorts
  - *Funded by DOE AMO*
  - *Recruitment is on going*
- Self-funded cohort
  - *Cost of cohort is shared by all the cohort members*

https://betterbuildingssolutioncenter.energy.gov/iso-50001/tools-expertise-training

Survey Says.....

- 4 out of 5 energy consultants surveyed* recommend 50001 Ready U.S. DEPARTMENT OF ENERGY

- To prevent this from happening to your Energy Team

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

advanced energy

Questions & Answers

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

909 Capability Drive, Suite 2100
Raleigh, NC 27606

advanced energy

Featured Presenter

Mike Stowe, P.E.

Advanced Energy

Bio Highlights:

- Senior Energy Engineer with Advanced Energy in Raleigh, NC.
- Has over 30 years experience in manufacturing with roles as a production manager, maintenance manager and plant engineer.
- Worked with many industrial processes and all types of plant facility systems.
- Industrial energy efficiency expert, consultant and trainer.
- Holds ISO 50001 certifications and is a DOE recognized instructor for 50001 related topics.