

U.S. DEPARTMENT OF
ENERGY

Office of
**ENERGY EFFICIENCY &
RENEWABLE ENERGY**

AMMTO & IEDO JOINT PEER REVIEW

May 16th-18th, 2023

Washington, D.C.

Energy Management Program

Ethan Rogers, Technology Manager

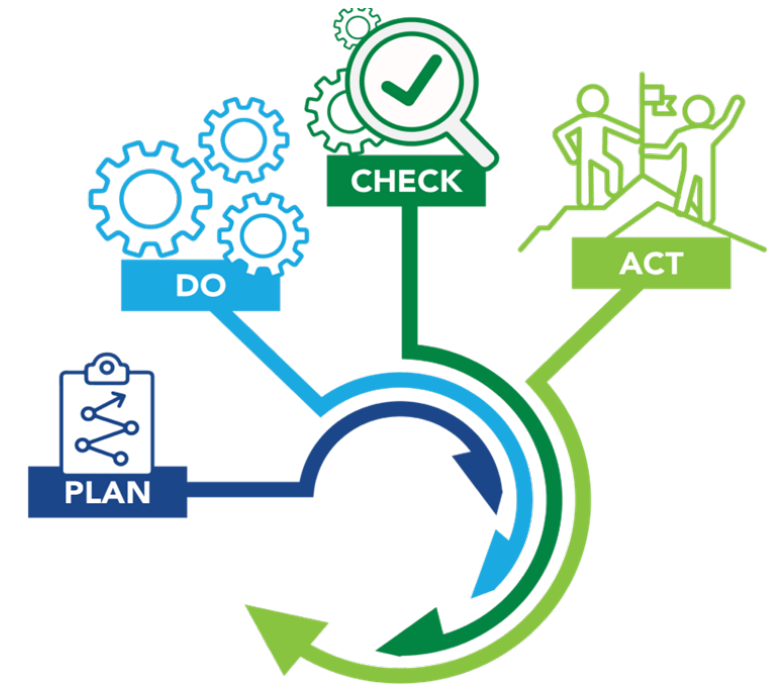
IEDO, Technical Assistance & Workforce Development

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What is an Energy Management System?

- **Energy Performance Improvement Platform**
 - Energy efficiency is only one focus
 - Integrated demand side management (IDSMS)
 - Resilience, security, demand, supply
 - Decarbonization
- **Operational Excellence Program**
 - Policies and procedures
 - Systematic approach
 - Change management
- **Broader Organizational Framework**
 - Energy management platform integrated into business systems
 - (Multinational) Corporate reporting, compliance, and alignment
 - Demonstrates action and commitment to long term success



A management system is:

- ✓ Say what you do
- ✓ Do what you say
- ✓ Prove it
- ✓ Improve it

What is an ISO 50001 Energy Management System?

ISO 50001 is a voluntary standard for establishing an energy management system

- Known globally and applicable to facilities in all sectors
- A protocol for organizations to implement a system with standard practices
- Similar ISO 90001 and ISO 140001 but focused on energy and energy management, same ISO high-level structure
- Improves the persistence of energy savings
- Establishes roles and responsibilities that build a culture around energy management
- Creates a system that can survive changes in leadership

“Not only is our ISO 50001 important to the environment, but any opportunity for us to conserve directly affects the bottom line. The money we saved, \$37 million, can be reinvested in the plant to create more jobs for the people here in Detroit.”

—Jeff Allen, Detroit Diesel

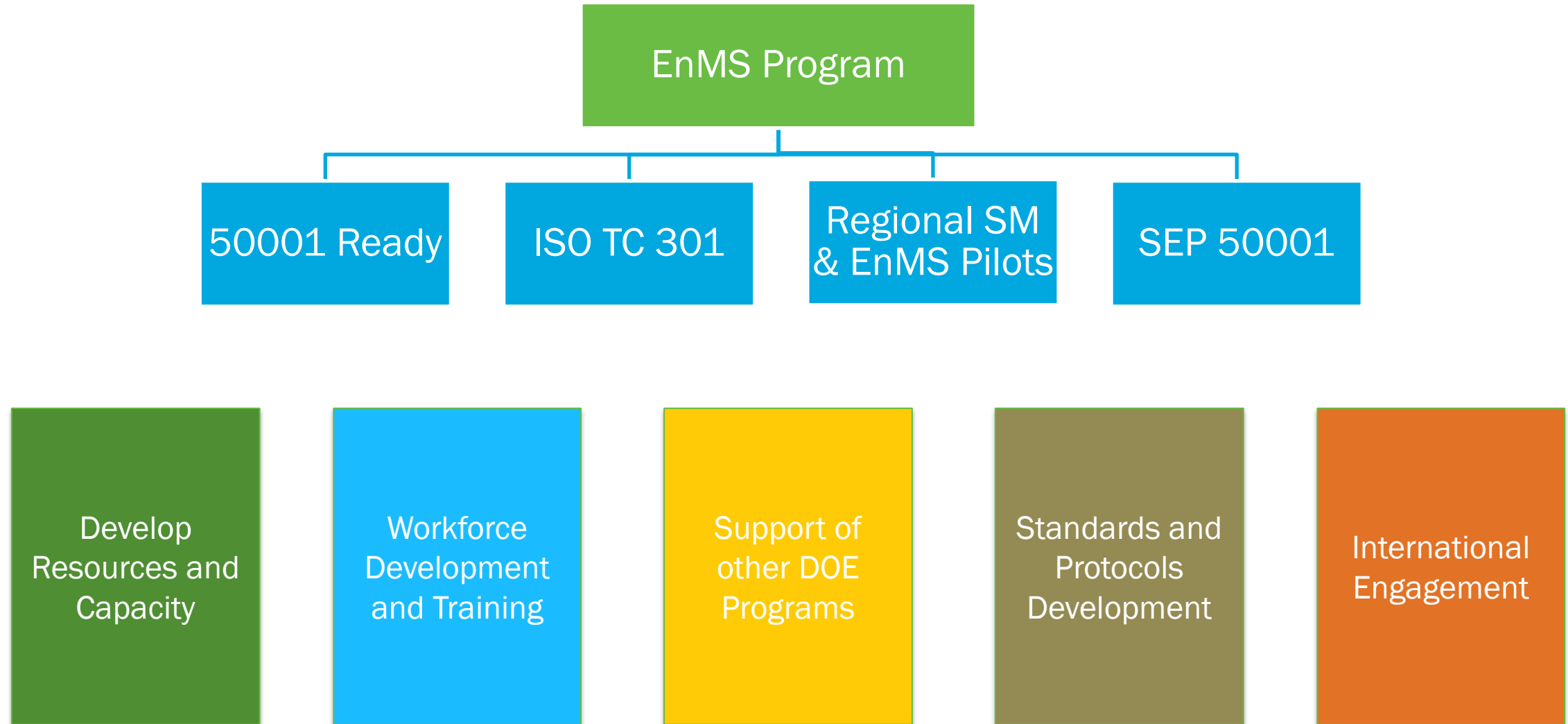
Challenges and Barriers

Barriers

- Implementing an EnMS is perceived as challenging
- Most organizations haven't the internal resources to go it alone
- Value proposition of an EnMS is not easily understood
- Market needs more energy management experts

Solutions

- Catalyze market activity
 - Work with utility-sector programs to embed EnMS/ISO 50001 concepts and to consider implementation of an EnMS an energy-saving project
 - Professional certifications and certificates for program implementers
 - Work with OEMs to engage tier 1 and 2 suppliers
- Create new resources for:
 - Facilities of all types and levels of experience
 - Engineering and business schools
 - SM & EnMS Pilots
 - Curricula for training organizations to leverage
- Align our EnMS programs with Better Climate Challenge, CDP, etc.
- Update SEP program to align with focus on decarbonization



Objective and Targets

Objective:

- Help organizations implement ISO 50001 compatible energy management systems. Take them from where they are to where they are willing to go.

Targets:

- Industrial facilities – energy and emission intensive
- All types of facilities with significant energy spend (>\$1 million/year)
- All types of facilities with the capacity to implement an EnMS

Vision

- Energy management systems become a standard practice for organizations to continually improve energy performance.

Mission

- We develop and deploy solutions to help organizations achieve their objectives.

Energy Management Program Supports IEDO Priorities by:

Objective:

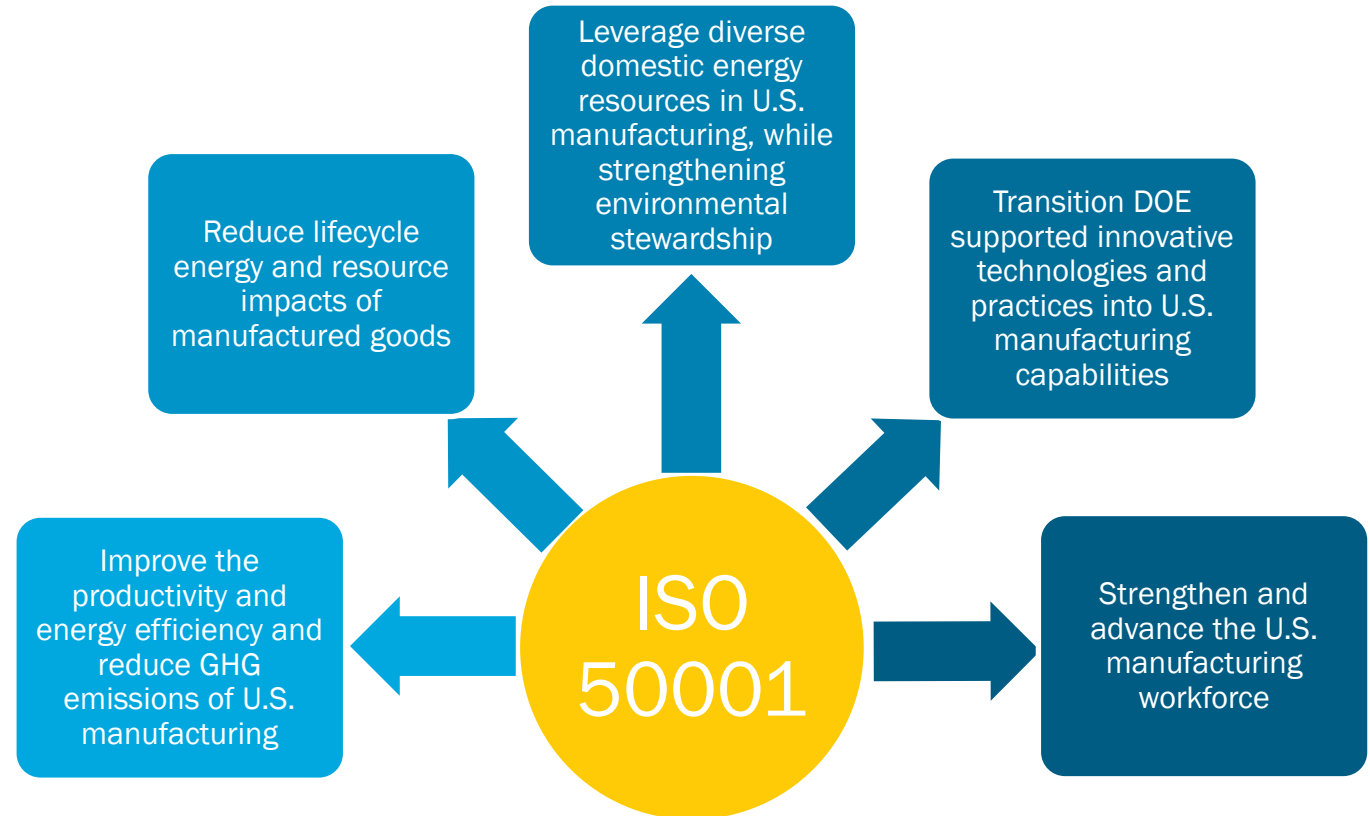
- Help organizations implement ISO 50001 compatible EnMSs.
- Take them from where they are to where they are willing to go.

Vision

- Energy management systems become a standard practice for organizations to continually improve energy performance and reduce GHGs.

Mission

- We develop and deploy solutions to help organizations achieve their efficiency and sustainability objectives.



EnMS Programs and Support of ISO 50001 Standard



SELF ATTEST



- Complete 25 steps in Navigator
- Self-attest to completion
- Report energy performance
- Recognition by DOE

Time required to complete: flexible



CERTIFY



- ANAB-accredited audit to certify to standard
- DOE support of US TAG/TC 301

Time required to complete: 12-18 months



VERIFY



- Requires ISO 50001 certification
- Robust M&V protocol
- 3rd party energy performance verification audit
- SEP 50001 Certification
- Professional certifications
- Elevated recognition by DOE

Time required to complete: 12-18 months

50001 Ready can be part of a Pathway toward ISO 50001 Certification and Validated Energy Savings in SEP

Success & Performance of 50001 Ready Sub-Programs

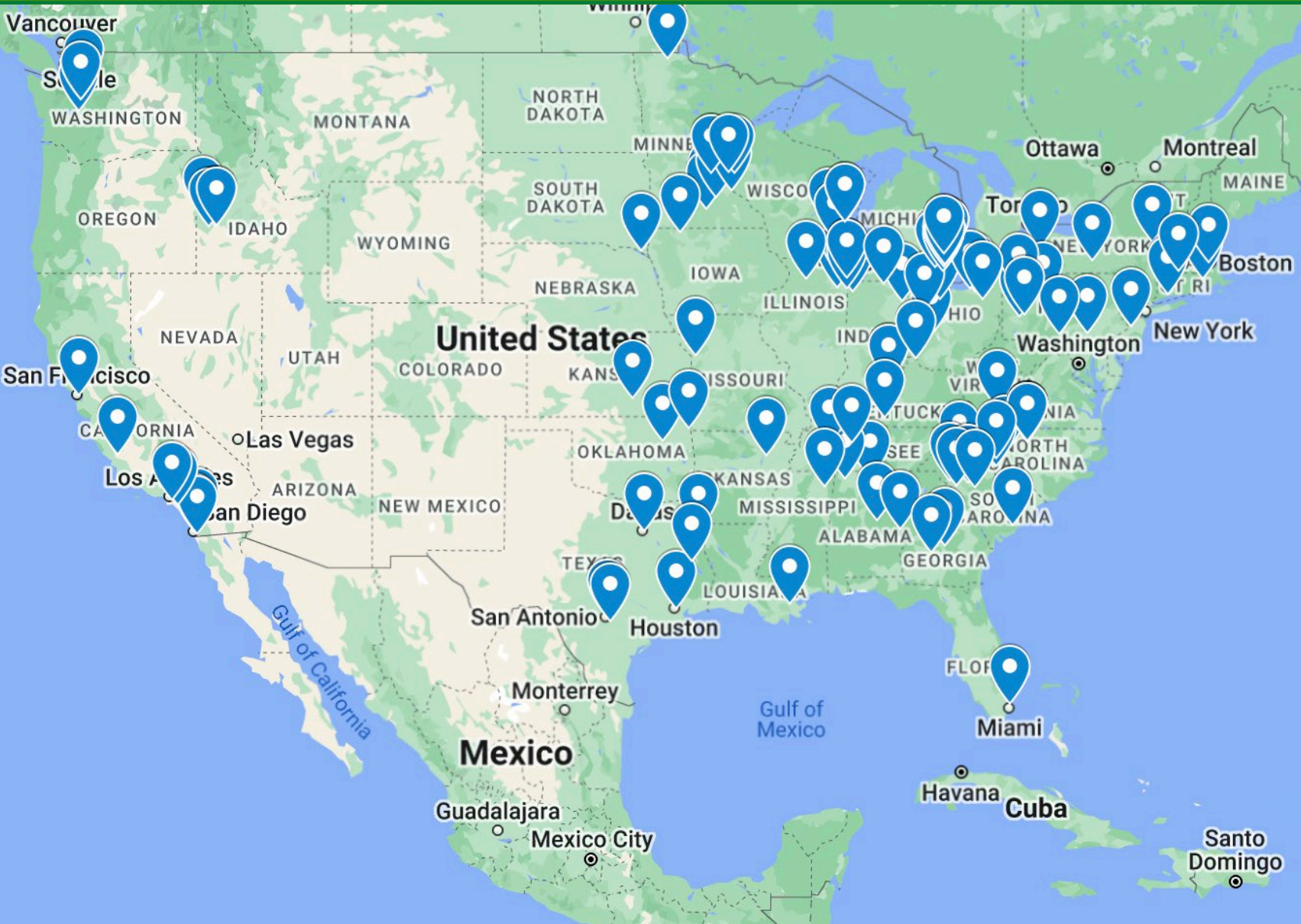


ISO 50001 Standard Structure and 50001 Ready Content

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	Leadership	Planning	Support	Operation	Performance evaluation	Improvement
1. An EnMS and your organization	4. Management commitment	7. Risk to EnMS success	14. Competence and training	17. Operational controls	20. Monitoring and measurement of the EnMS	24. Corrective action
2. People and legal requirements	5. Energy policy	8. Energy data collection and analysis	15. Awareness and communication	18. Energy considerations in design	21. Monitoring and measurement of energy performance improvement	25. Continual improvement
3. Scope and boundaries	6. Energy team and resources	9. Significant energy uses	16. Documenting the EnMS	19. Energy considerations in procurement	22. Internal audit	
		10. Improvement opportunities			23. Management review	
		11. Energy performance indicators and baselines (EnPIs and EnBs)				
		12. Objectives and targets				
		13. Action plans for continual improvement				

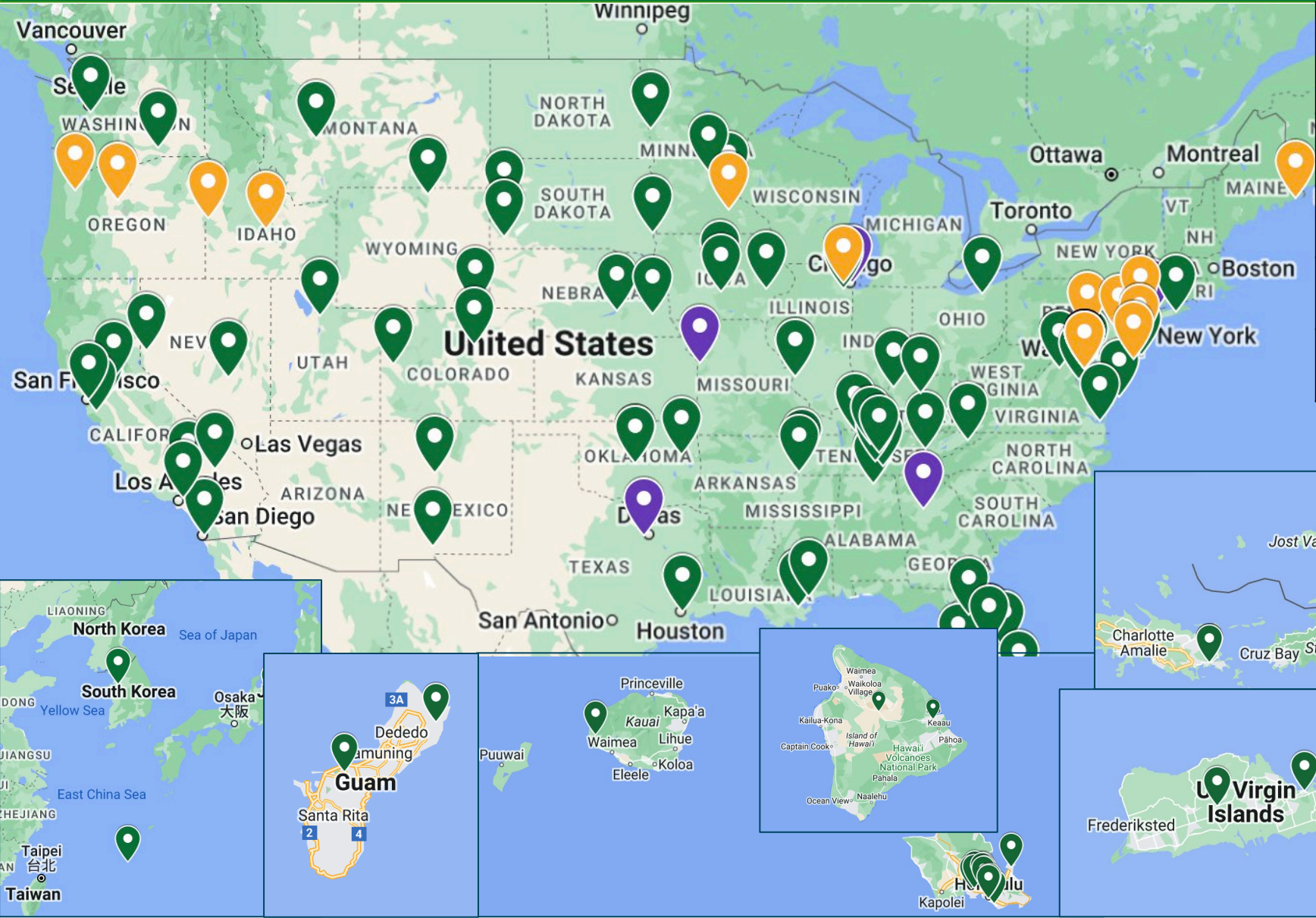
Virtual cohorts for IEDO



Office	# Sites Engaged	Participants
IEDO	129	248



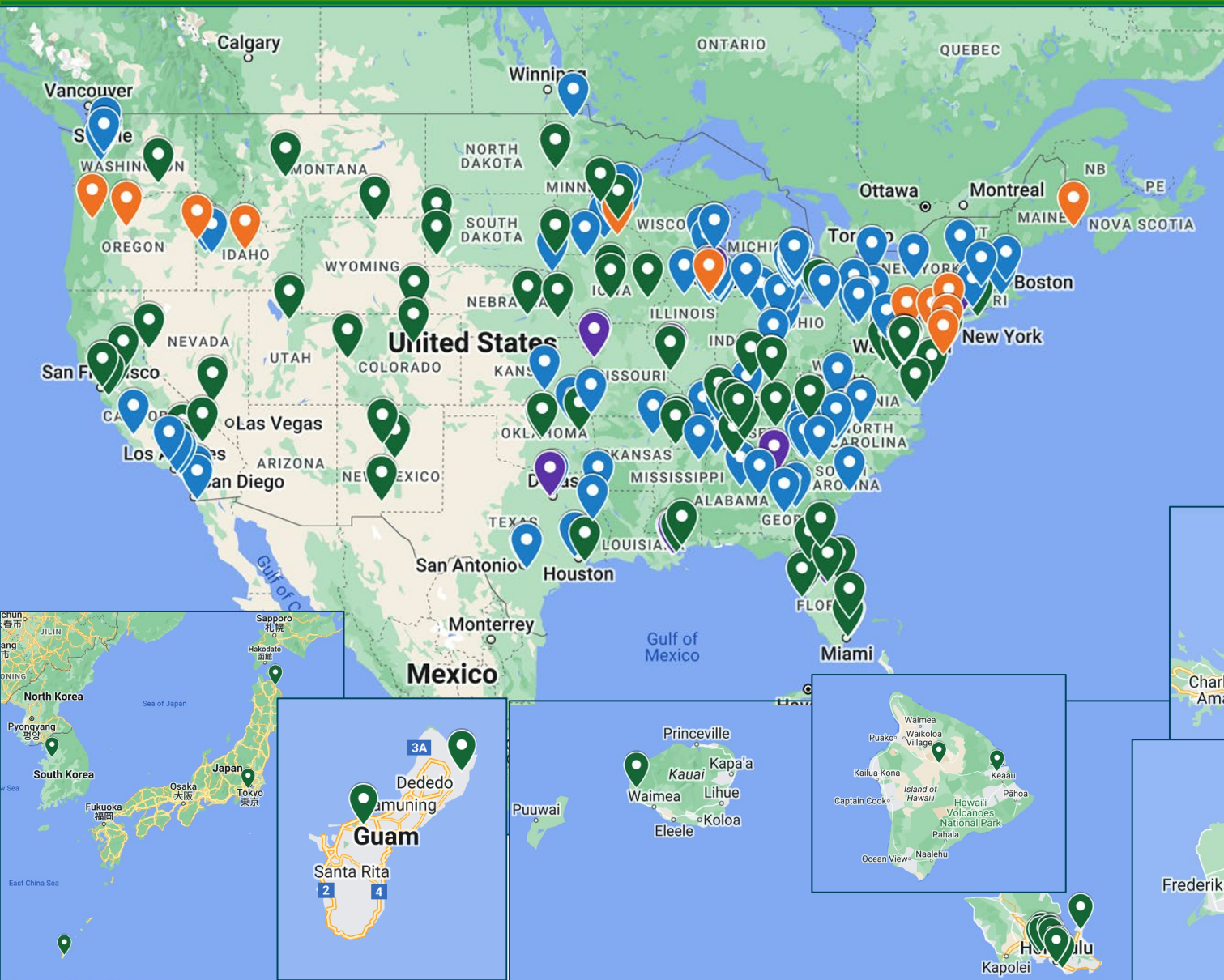
Virtual cohorts for BTO, FEMP, SCEP



Office	# Sites Engaged	Participants
FEMP	111	140
SCEP	26	77
BTO	12	19
Total	149	236

-  FEMP
-  SCEP
-  BTO

Virtual cohorts for IEDO, FEMP, SCEP, BTO



Office	# Sites Engaged	Participants
IEDO	129	248
FEMP	111	140
SCEP	26	77
BTO	12	19
Total	278	484

-  IEDO
-  FEMP
-  SCEP
-  BTO

50001 Ready Partners (as of March 2023)



Canadian facilities are now 50001 Ready recognized by Natural Resources Canada

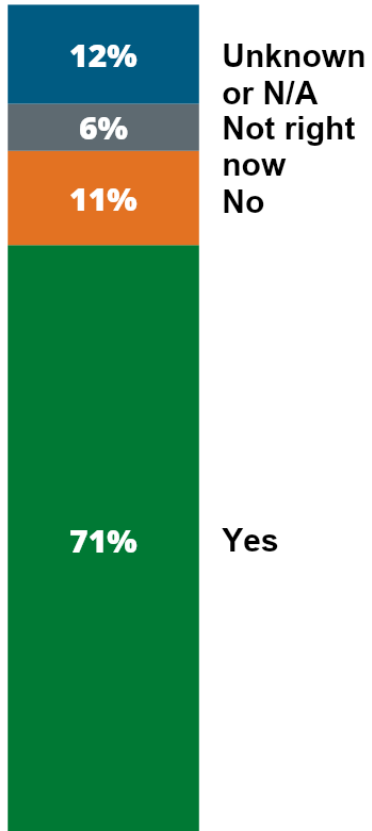


[50001 Ready Canada Video](#)

Pivoting to Decarbonization through Energy Management

50001 Ready Navigator Decarbonization Management Guidance

Do you see using 50001 Ready to manage your decarbonization efforts?
(n=35)



Developed in 2021, piloted in 2022, the guidance helps organizations meet their decarbonization objectives.

Updating guidance to align with BCC's industrial and commercial emission reduction guidance.

50001Ready.lbl.gov



Task 1: We determine the strategic issues that affect our ability to improve energy performance and achieve the goals of our 50001 Ready energy management system.

Current Task Status: Completed

Not Started ✕ In Progress ⚙️ Ready For Review 🔍 Completed ✓ Next Task →

Your roles for this task: Contributor & Approver

Partner Task Guidance From: Flash Cohort

Establish your scope and boundaries

Detailed Guidance: An EnMS and Your Organization

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

Decarbonization Not required for DOE recognition

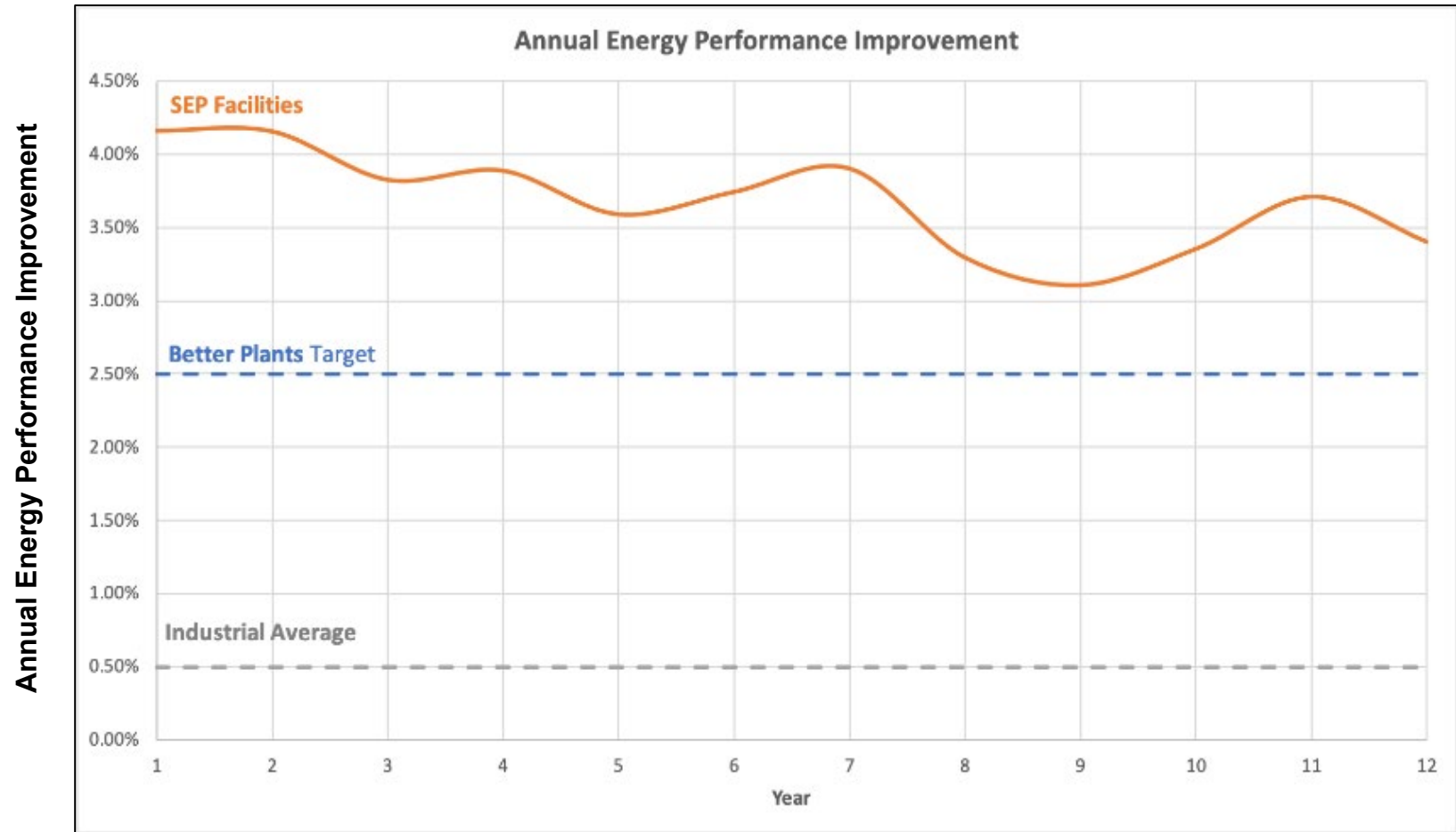
When reviewing the strategic issues that affect your ability to achieve the goals of your energy management system, you should keep in mind that these goals will likely include the reduction of energy-related GHG emissions.

The first step in integrating energy-related GHG emissions into the management system is to identify the issues that may affect your ability to achieve the intended outcomes of the management system, including the reduction of energy-related GHG emissions. Examples of the issues that may be relevant to your organization are provided in the "Full Description" tab for this task and in many cases will come from the organization's strategic or long-term planning processes.

Superior Energy Performance 50001 Program

- Analysis of eleven years of SEP program participants' energy savings shows *a 4.2% improvement* across all facilities in the first year.
- By the 11th year, the facilities are still achieving *a 3.4% year on year improvement* in energy performance.
- Far exceeds the average improvement in energy intensity across all of industry
 - 0.5%/year per EIA
 - 1.3%/year per IEA
- Journal article to publish in [Sustainable Energy Technologies and Assessments](#) in late 2023

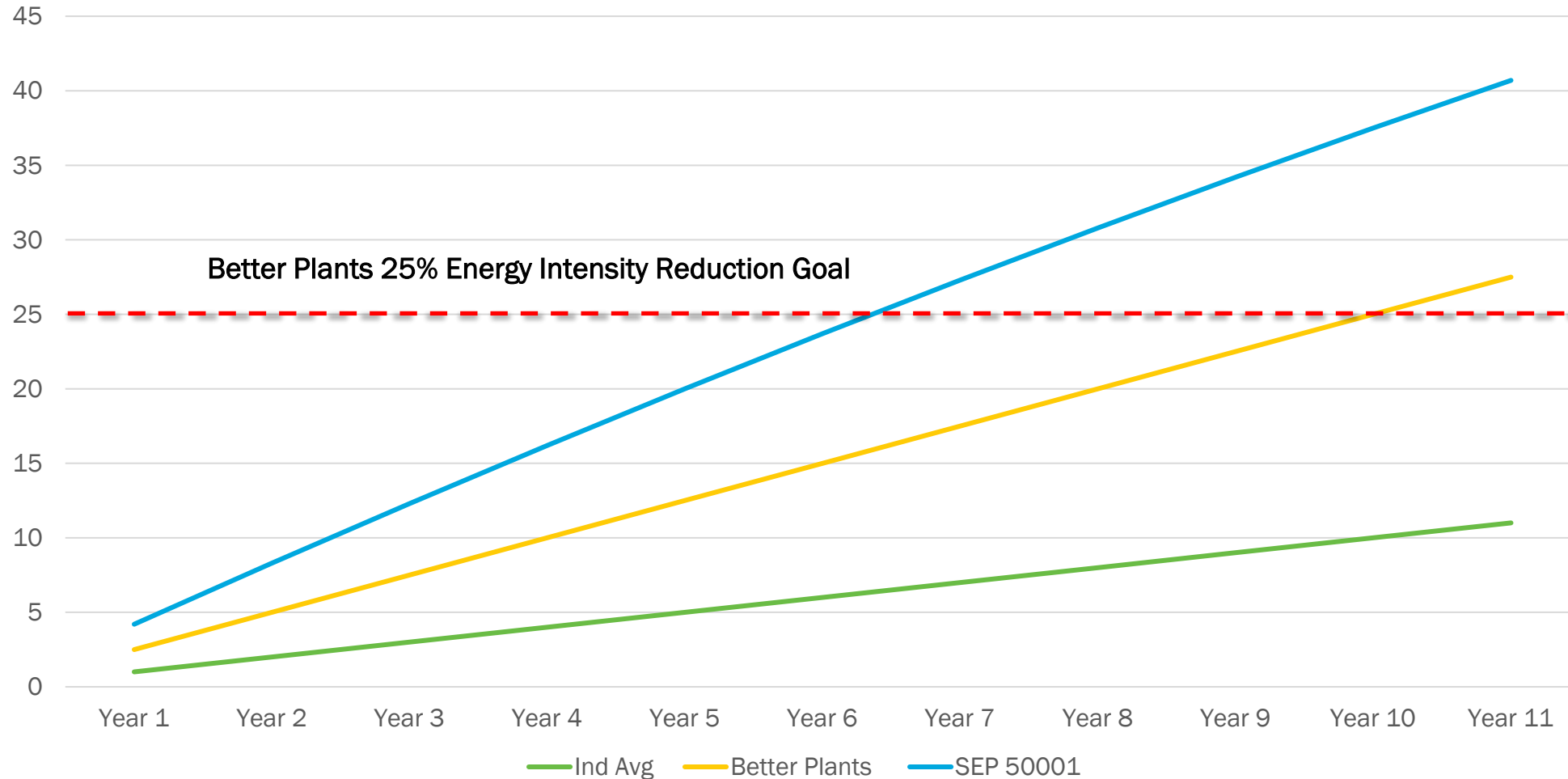
Research Findings: Energy Management Saves More Energy



2022 LBNL analysis

Energy Management Accelerates Results

SEP 50001 performance, Better Plants Goal
vs Business as Usual



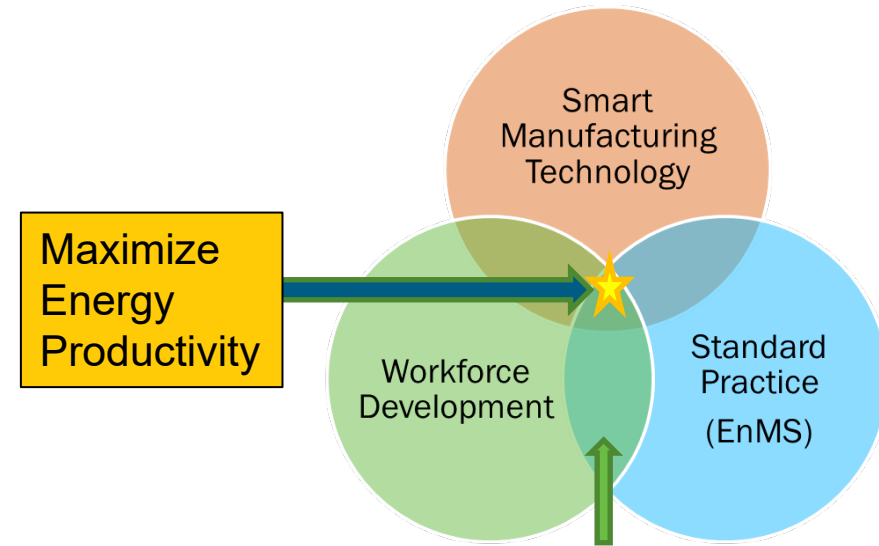
Regional Smart Manufacturing & Energy Management Pilots

Challenge

- Manufacturers have difficulty adopting smart manufacturing technologies, and;
- Integrating them into energy management best practices (ISO 50001)

Solution

- Technical assistance to help manufacturers integrate smart technologies with systematic energy management -
- Provided through three regional capacity building collaborations that will -
- Develop, pilot, and propagate technical assistance program models in 2023 – 2024



Most Energy Management Programs

<p><i>Regional Initiative to Integrate Smart Manufacturing and Energy Management Systems</i></p> <ul style="list-style-type: none"> • Midwest Energy Efficiency Alliance (MEEA) • IL, IN, KY, MI 	<p><i>Southeast Energy Efficiency Manufacturing Collaborative</i></p> <ul style="list-style-type: none"> • Southeast Energy Efficiency Alliance (SEEA) • NC, SC, GA, FL 	<p><i>East Tennessee Initiative for Smart Energy Management (ETISE)</i></p> <ul style="list-style-type: none"> • University of Tennessee Knoxville (UTK) • Eastern TN
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Awardees selected FY22-Q4; To launch FY23-Q2

Future Work

Expanding Reach

- Work with OEMs and supply chains
- Work with universities, community colleges, and training programs
- Engage more regional, state, and local energy efficiency programs
 - Energy management
 - Decarbonization management
 - Smart Manufacturing
 - Professional accreditations
- Coordinate and support other programs and offices

New Product Development

- Pilot and improve EnMS curriculum for engineering schools
- Provide recognition to students
- Modify for business schools and training programs
- Energy Management Assessment (EMA) gap analysis tool
- Database of energy management case studies
 - Ready cohorts
 - Ready Partners
 - Clean Energy Ministerial Energy Management Leadership Awards

Leadership

- Leadership of US Technical Advisory Group and ISO Technical Committee (US TAG/TC301)
 - Development of energy-related decarbonization protocols and standards
 - Coordination with other ISO technical committees on decarbonization issues
 - Hosting meeting of delegates in July
- 50001 Ready Navigator = the default EnMS implementation tool worldwide

Engaging OEMs and Supply Chains



“50001 Ready has proven critical in managing operations at GM efficiently throughout this year’s challenges and positioned us well to meet our net-zero 2050 goals. Our implementation enabled us to establish common processes and procedures to increase efficiency, optimize production, and aid in effective remote troubleshooting. These actions have been indispensable in supporting GM’s responsiveness to the operational variabilities and challenges introduced by the COVID-19 pandemic.”

Bob Baird, Energy Sustainment Manager, General Motors

Bringing Order to Energy Efficiency & Decarbonization



“I highly recommend 50001 Ready. It helps bring a structure to the chaos of managing several million square feet of energy-consuming facilities and large energy systems.”

Ray Throop, Energy Engineer, Operations and Maintenance Division, U.S. Army Garrison Fort Bragg, Directorate of Public Works

Questions?

Energy Management Program

Ethan Rogers, Technology Manager,

IEDO, Technical Assistance & Workforce Development

