



U.S. DEPARTMENT  
*of* **ENERGY**

Federal Energy  
Management Program

# Sharpest Tools in the Fed (Resources for Energy and Water Managers)

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T03-S05, August 6th, 2025

**FEMP Summer CAMP** (Courses Aligned with Mission Priorities)



# Dan Howett, PE

Carrier Corporation

Federal Government Liaison

# Agenda

- Session Learning Objectives
- Department of Energy's 50001 Ready Program
- MEASUR, VERIFI, and JUSTIFI: DOE ITO Software Tools
- Conclusion and Q&A

# Session Learning Objectives

1. Recognize resources to help save time and money while pursuing the energy and water conservation mission.
2. Identify tools that can be utilized and adjusted to save water and energy.
3. Recognize the basics of buildings systems and equipment.
4. Identify how to best utilize the described tools through demos.



# Peter Therkelsen

Staff Scientist, Lawrence Berkeley National Laboratory

# ISO 50001 Energy Management System Standard

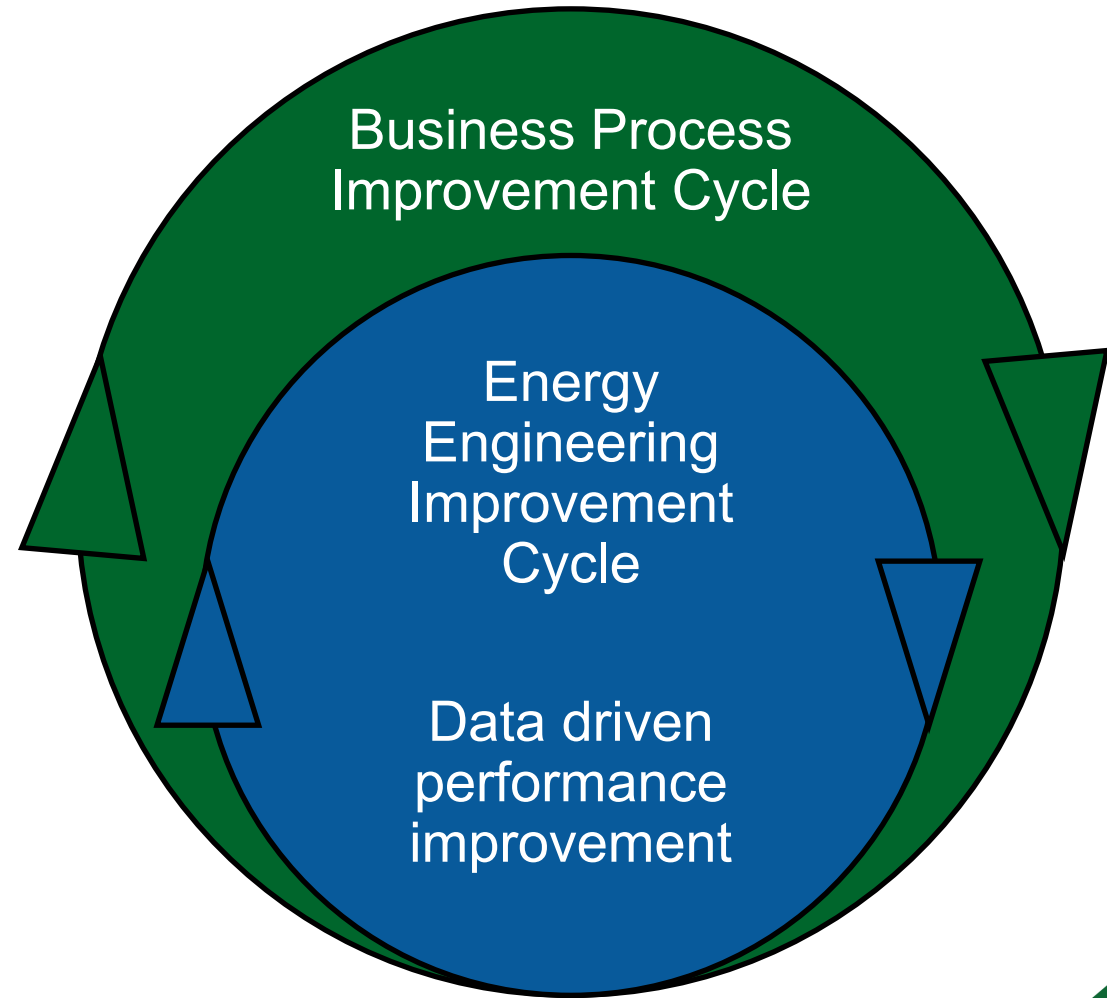
- A **framework** for continual improvement of energy performance
- A **global standard** developed by 56 countries with U.S. leadership
- A **flexible business practice** used by 57,000+ sites worldwide

50001's data-driven, flexible design helps organizations achieve **persistent energy** and **cost savings** over the long term

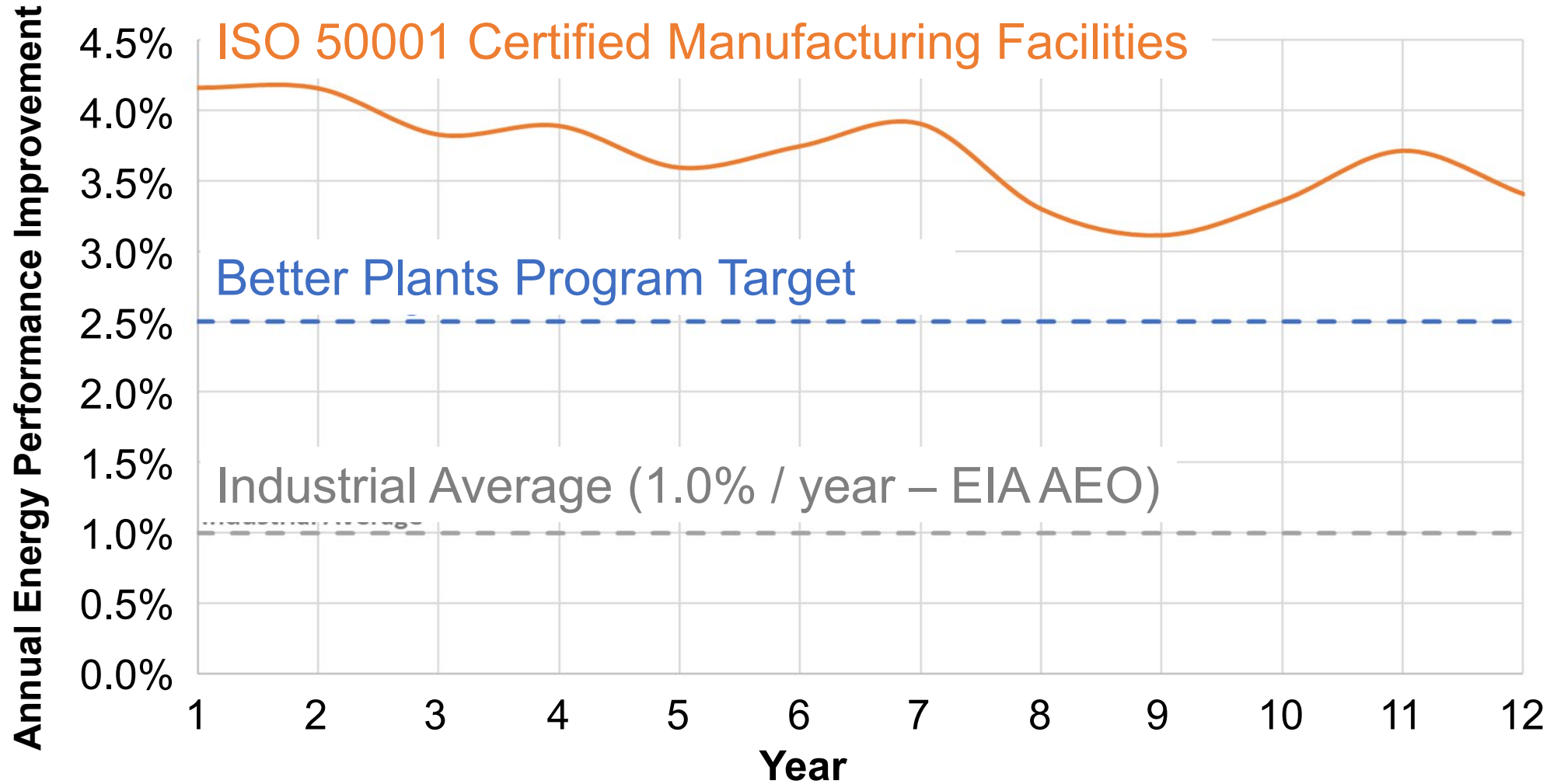


# Systematic Approach for Continual Improvement

- All economic sectors
- Small to large companies
- Can be built on ISO 9001 and ISO 14001



# Energy Savings That Grow Year over Year



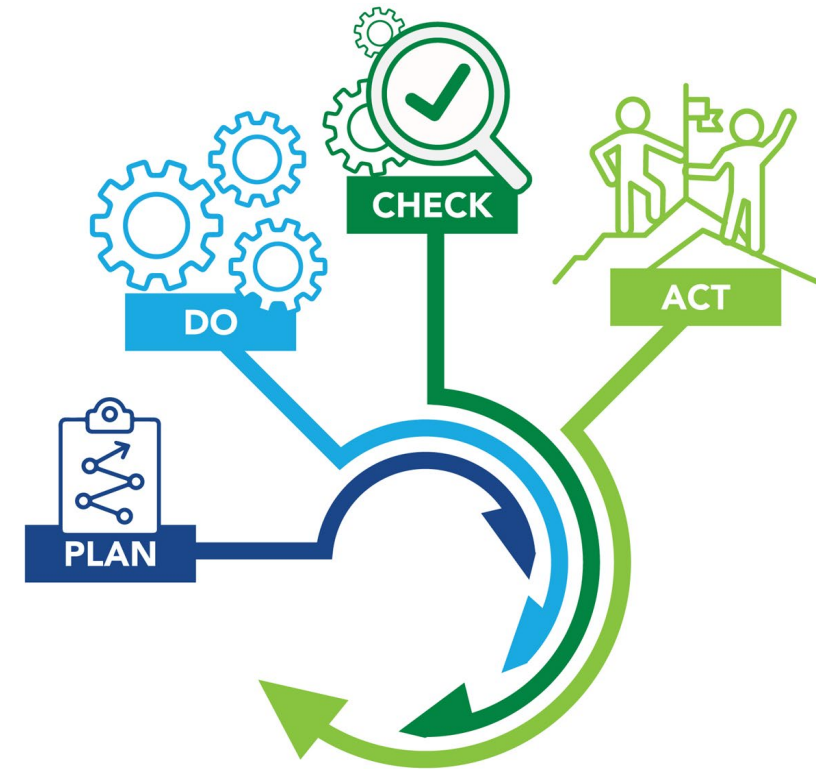


# DOE 50001 Ready



**50001 Ready**  
U.S. DEPARTMENT OF ENERGY

- Developed and launched by the U.S. Department of Energy in 2017
- No-cost, self-paced, step-by-step framework
  - Aligns with ISO 50001 standard
- Recognizes US-based organizations that implement comprehensive energy management systems



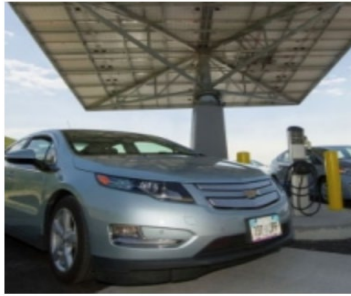
# 50001 Ready Supports Federal Sustainability Goals



Acquisition and  
Electronics  
Stewardship



Facility Energy  
Efficiency



Fleet  
Management



Emissions



Performance  
Tracking and  
Reporting



Renewable  
Energy and  
Electricity

## 2022: CEQ Guidance on E.O. 14057

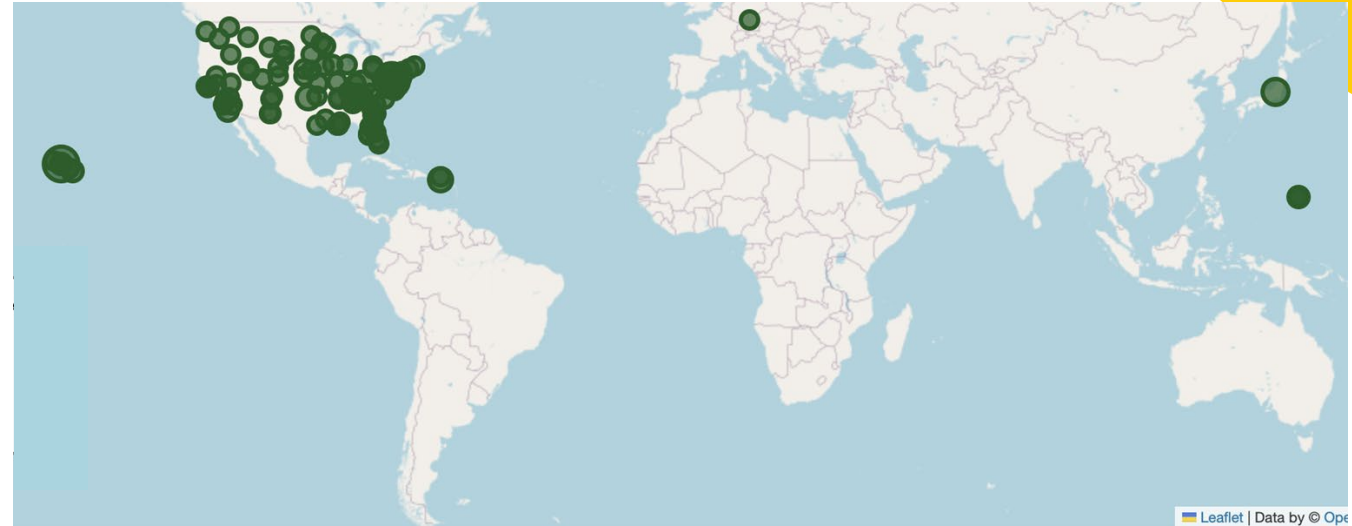
“Agencies should continue to use effective management strategies such as environmental management systems (EMS) and energy management systems (EnMS), if they align with and support their agency needs and facilitate implementation and progress towards E.O. goals”

## Energy Policy Act of 2020

- Sec. 1002. Encourages federal energy managers to consider use of systems approach to managing energy and water
- Names ISO 50001 specifically as the standard to model the system approach on.

# 50001 Ready can Scale and Benefit all Federal Agencies

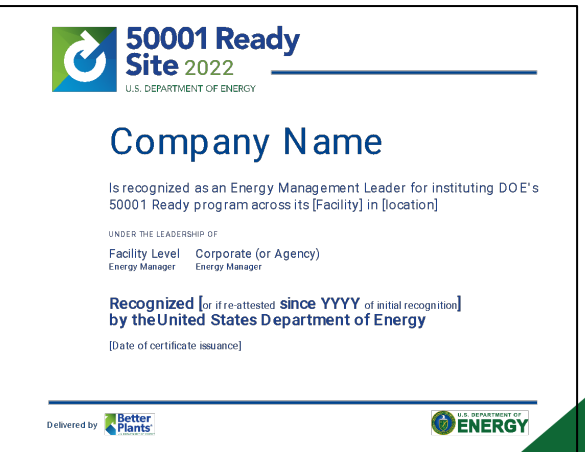
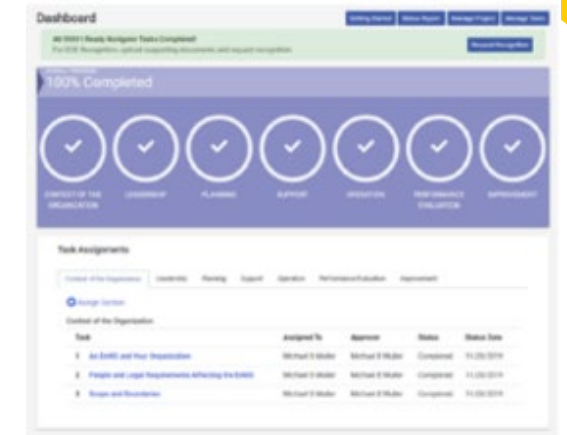
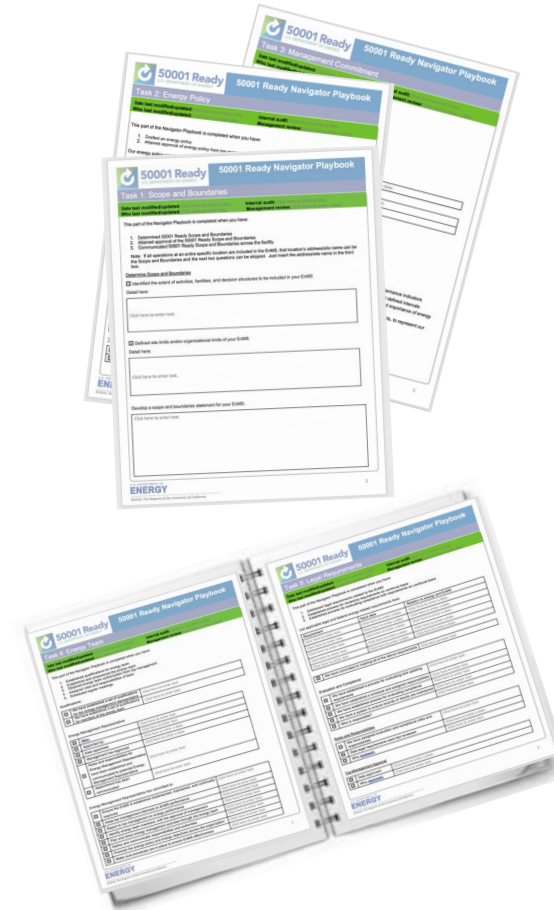
- Trainings touch many through virtual engagement
- Worldwide engagement
- Supports large and small agencies
- Supports different phases of energy manager's career
- 50001 Ready enables success of FEMP programs



Location of 146 Federal Sites that  
Received 50001 Ready Training

# Free guidance to implement 50001 Ready

- Self-paced, step-by-step guidance to implement an ISO 50001-based energy management business practice
- Suite of free DOE resources
- Supports individual and multi-facility implementation
- DOE recognition for declaring completion of 50001 Ready implementation



# 50001 Navigator

- Guidance broken into straight forward sections, including:
  - Getting It Done – what specifically needs to be accomplished
  - Task Overview – how does this task connect with ISO50001
  - Full Guidance – comprehensive guidance about the task
  - Transition Tips – from other ISO management systems or ENERGY STAR
- Track and update task progress
- Ability to assign tasks to team members to facilitate team collaboration
- Access over 100 related resources

The screenshot displays the 'Context of the Organization' section of the 50001 Navigator. At the top, there are navigation links: 'Back to Project Dashboard', 'Manage Project', and 'Manage Team'. Below these is a 'Task Status (click to jump):' bar with 25 numbered circles, where circles 9, 10, and 19 are highlighted in green. The main task area shows 'Task: An EnMS and Your Organization' with a dropdown arrow. Below this is a navigation bar with '← BACK TO DASHBOARD', a progress indicator with circles 1, 2, and 3, and a 'NEXT →' button. The task description reads: '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.' It also shows the 'Central Office role for this task: Contributor' and the 'Current Task Status: Completed'. A note states 'You are currently not assigned to this task.' To the right is a 'Get Help' box with buttons for 'Contact ABC Utility', 'Contact Central Office', and '50001 Ready Help Desk'. Below the task description is a 'Partner Task Guidance From: ABC Utility' section with a text input field 'Establish your scope and boundaries'. The 'Detailed Guidance: An EnMS and Your Organization' section has tabs for 'Getting It Done', 'Task Overview', 'Full Description', 'Decarbonization', 'Notes', 'Playbook', and 'Assignments'. The 'Getting It Done' tab is active, showing a list of steps: '1. Identify the external and internal strategic issues that affect your organization's ability to improve its energy performance and achieve the intended outcomes of the energy management system (EnMS).', '2. Record this information.' The 'Task 1 Guidance Version: v18.01.01.02' is displayed at the bottom.



# 50001 Ready Workbook Sample Templates



DEPARTMENT OF THE ARMY  
US ARMY INSTALLATION MANAGEMENT COMMAND  
HEADQUARTERS, UNITED STATES ARMY GARRISON, **SITE**  
**SITE ADDRESS**

**EXAMPLE**

**DATE**

MEMORANDUM FOR U.S. Army **SITE** and **SITE ADDRESS**

SUBJECT: Policy Letter #**XX**: Energy Management Policy

1. References.

- a. AR 420-1 (Army Facilities Management), 24 August 2012.
- b. Department of the Army Energy Security and Sustainability (ES<sup>2</sup>) Strategy, 1 May 2015.
- c. **ISO 50001: 2018, Energy management systems**

2. Applicability. This policy applies to all units and activities assigned or stationed on **SITE**.

3. Purpose. To establish an Energy/**Water** Security and Management Policy for **SITE**.

4. This policy memorandum supersedes **previous policy/date (if applicable)**.

5. Policy. **SITE** has implemented an Energy Management System (EnMS) to enhance the establishment of an installation policy regarding energy/**water** security and conservation management by identifying utility requirements, creating resource awareness, and investing in efficient, cost effective technologies. It is the objective of **SITE** to use resources efficiently and provide energy/**water** security by following the Army's Energy Security and Sustainability (ES<sup>2</sup>) Strategy and the **ISO 50001** Energy Management standard. All entities on **SITE** will promote a resource conscious environment by pursuing the five goals of the ES<sup>2</sup> Strategy:

- a. Goal 1 – Informed Decisions
- b. Goal 2 – Optimize Use
- c. Goal 3 – Assure Access
- d. Goal 4 – Build Resiliency



**50001 Ready**  
U.S. DEPARTMENT OF ENERGY



**50001 Ready Navigator Playbook**

## Task 9: Significant Energy Uses (SEUs)

SEU Name	Criteria for Selection	Relevant Variable(s)	Current Energy Performance Estimate	Projected Energy consumption (FY 2021)	Personnel responsible
Building/ Equipment Cooling & Refrigeration	#1 Energy consumer and good opportunity for improvements	CDD Relative Humidity	1,501,025 MMBTU/year	1,400,000 MMBTU/year	Jane Watts
Building / Water Heating	#2 Energy consumer and good opportunity for improvements	HDD	1,271,315 MMBTU/year	1,100,000 MMBTU/year	N.R. Gee
Lighting	#3 Energy consumer and excellent opportunity for improvements	Occupancy (potentially, not confirmed)	363,151 MMBTU/year	347,000 MMBTU/year	Andy Volta

<input checked="" type="checkbox"/>	Date entered:	ENTER DATE
<input checked="" type="checkbox"/>	Who entered?	ENTER NAME
<input checked="" type="checkbox"/>	Who reviewed?	ENTER NAME

5. Review the SEU selection criteria as part of the SEU update process.

☒ We have established a procedure for continually reviewing relevant variables at regularly scheduled intervals, along with responsible personnel.

Most of the energy loads are like those of commercial buildings of various types. Sub-metered energy data from the Central Energy Plant and contractor XXX is used to predict site-wide heating and cooling loading. For other loads commercial segment benchmarking information is used. This process is completed within the Energy Mapping spreadsheet.

☒ Developed a system for monitoring performance of SEUs

We used the Energy Mapping template to monitor, update, review and verify SEU selection.

☒ Assigned roles and responsibilities for monitoring SEUs

Energy Team Leader – Lead and oversee

REMs – Technical review of data and Energy Mapping spreadsheet


# 50001 Dashboard: Regional View

- 50001 Ready can be used at the:
  - Installation Level
  - Regional Level
  - HQ Level
- Dashboards provide oversight of energy status

Contact	Site Name	Task Progress	Action	Last Activity
	San Juan VAMC	<div><div>1 2 3 4 5 6 7 8 9 10 11 12 13</div><div>14 15 16 17 18 19 20 21 22 23 24 25</div></div>	<a href="#">Dashboard</a>	06/24/2020 <a href="#">Notes 1</a> <a href="#">Remove</a>
	Orlando VAMC	<div><div>1 2 3 4 5 6 7 8 9 10 11 12 13</div><div>14 15 16 17 18 19 20 21 22 23 24 25</div></div>	<a href="#">Dashboard</a>	06/24/2020 <a href="#">Notes 1</a> <a href="#">Remove</a>
	West Palm Beach VA Medic...	<div><div>1 2 3 4 5 6 7 8 9 10 11 12 13</div><div>14 15 16 17 18 19 20 21 22 23 24 25</div></div>	<a href="#">Dashboard</a>	06/15/2020 <a href="#">Notes 1</a> <a href="#">Remove</a>
	Tampa VAMC	<div><div>1 2 3 4 5 6 7 8 9 10 11 12 13</div><div>14 15 16 17 18 19 20 21 22 23 24 25</div></div>	<a href="#">Dashboard</a>	04/18/2022 <a href="#">Notes 1</a> <a href="#">Remove</a>
	Miami VAMC	<div><div>1 2 3 4 5 6 7 8 9 10 11 12 13</div><div>14 15 16 17 18 19 20 21 22 23 24 25</div></div>	<a href="#">Dashboard</a>	06/24/2020 <a href="#">Notes 1</a> <a href="#">Remove</a>
	Bay Pines VAMC	<div><div>1 2 3 4 5 6 7 8 9 10 11 12 13</div><div>14 15 16 17 18 19 20 21 22 23 24 25</div></div>	<a href="#">Dashboard</a>	09/22/2020 <a href="#">Notes 1</a> <a href="#">Remove</a>
	Gainesville VAMC	<div><div>1 2 3 4 5 6 7 8 9 10 11 12 13</div><div>14 15 16 17 18 19 20 21 22 23 24 25</div></div>	<a href="#">Dashboard</a>	12/14/2020 <a href="#">Notes 1</a> <a href="#">Remove</a>

Status Key: <span>Not Started</span> <span>In Progress</span> <span>Ready For Review</span> <span>Completed</span> <span>★ DOE Recognition</span>																
Name	Association	Progress	Task Status												Team Members	Last Action
Salt Lake City VAMC		0%	<div><div>12345678910111213</div><div>141516171819202122232425</div></div>												2	04/26/2022
Sheridan VAMC		0%	<div><div>12345678910111213</div><div>141516171819202122232425</div></div>												2	04/29/2022
Cheyenne VAMC		0%	<div><div>12345678910111213</div><div>141516171819202122232425</div></div>												2	04/26/2022
Rocky Mountain Regional VAMC		0%	<div><div>12345678910111213</div><div>141516171819202122232425</div></div>												5	06/01/2022
			<div><div>12345678910111213</div></div>													

# Navigator Live Demo



## Navigator

LANGUAGE  
English

Contact  
Subject Matter Experts  
FAQs

Navigate Project: [Project Dashboard](#) [Select a Section](#) [Get Recognized](#)

### Dashboard

Getting Started | Status Report | Manage Project | Manage Team

All 50001 Ready Navigator Tasks Completed!  
For Recognition, upload supporting documents and request recognition. [Request Recognition](#)

OVERALL PROGRESS:  
100% Completed

✓

✓

✓

✓

✓

✓

✓

Context of the Organization

Leadership

Planning

Support

Operation

Performance Evaluation

Improvement


### Task Assignments

Context of the Organization | Leadership | Planning | Support | Operation | Performance Evaluation | Improvement

[Assign Section](#)

Task	Assigned To	Approver	Status	Status Date
1 <a href="#">An EnMS and Your Organization</a>	Paul Sheaffer Jay Wrobel	Paul Sheaffer	Completed	10/17/2023
2 <a href="#">People and Legal Requirements Affecting the EnMS</a>	Paul Sheaffer	Paul Sheaffer	Completed	10/15/2021
3 <a href="#">Scope and Boundaries</a>	Paul Sheaffer Jay Wrobel	Paul Sheaffer	Completed	04/05/2021

U.S. DEPARTMENT OF  
**ENERGY**



English | Français | Español

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The 50001 Ready Navigator is a resource of the Department of Energy's Industrial Efficiency and Decarbonization Office.  
[Industrial Efficiency and Decarbonization Office](#) | [Office of Energy Efficiency & Renewable Energy](#)



# 50001 Ready Recognition from DOE

## DOE promotes participants' success

- DOE facility certificates of recognition
- Tailored promotional packages:
  - Company logos featured on DOE 50001 Ready sites
  - Project showcase highlight achievements
  - Access to customizable press material and resources



**50001 Ready**  
U.S. DEPARTMENT OF ENERGY

CASE STUDY

## Federal Aviation Administration—Oklahoma City, Oklahoma

### WHY 50001 READY?

The U.S. Department of Energy's 50001 Ready program is a self-paced, no-cost way for organizations to build a culture of structured energy improvement that leads to deeper and sustained energy and GHG savings. Recognition is available for facilities and organizations that self-attest to the implementation of an ISO 50001-based energy management system without external audits or certifications.

### Overview

The Mike Monroney Aeronautical Center (MMAC) in Oklahoma City is a Federal Aviation Administration (FAA) facility that has been the home of the Administration's medical and human factors research and training operations for more than 75 years. Encompassing more than 1,000 acres and over 130 buildings, the MMAC is home to the FAA Academy for technical training, the Civil Aerospace Medical Institute, the FAA Logistics Center, the aircraft pilot and drone registries, and the Enterprise Services Center. The MMAC campus hosts more than 6,300 federal and contract employees, with an annual operating budget of over \$1 billion.

Sustainability initiatives have been a strategic priority for the MMAC, which faces both challenges and opportunities specific to a federal agency. Decarbonization goals and targets are established by energy legislation and executive orders. For example, the 2007 Energy Independence and Security Act (EISA) requires that federal agencies identify the key buildings that comprise 75% of total energy usage and conduct regular energy and water audits on those buildings. In addition, those buildings must be recommissioned and system controls must be evaluated and optimized for current use. Having a robust energy management system in place can provide the structure needed to respond to sustainability requirements that will likely change over time.

To be proactive in meeting requirements, the FAA, under the U.S. Department of Transportation (DOT), prioritized 50001 Ready recognition for its facilities. FAA headquarters set an initial goal for five facilities to



FAA Mike Monroney Aeronautical Center Entrance. Photo credit: Bryan Dahlvang, FAA MMAC

become 50001 Ready, and the MMAC took the lead, becoming the first facility in all of DOT to officially establish an energy management system and become 50001 Ready—a particularly important milestone for the FAA and DOT.

Fortunately, the MMAC already had a robust sustainability program. In addition to the regular EISA audits and building recommissioning, the facility participates in the regional utility's strategic energy management program. The MMAC has benchmarked 60 of its buildings through ENERGY STAR Portfolio Manager, and several facilities are ENERGY STAR certified. Furthermore, the MMAC's experiences from achieving certifications in ISO 14001, ISO 9001, and ISO 45001 gave the Center a good understanding of the management system process.

By adding 50001 Ready to its energy program, the MMAC is demonstrating its commitment to continual improvement, a significant step for an organization with a robust system already in place.

Learn about [50001 Ready](#) and explore the [50001 Ready Navigator tool](#)

U.S. DEPARTMENT OF  
**ENERGY**

# 50001 Ready Virtual Training Cohorts

- Dedicated 50001 trainer/coach
- Nine to twelve-month program with monthly webinars
- 1:1 coaching between trainings
- Interaction with other cohort members through an online forum



## 50001 READY COHORTS

Technical Assistance to Implement Energy Management Systems

### Technical Assistance

The U.S. Department of Energy's 50001 Ready program is providing free technical assistance to cohorts of U.S.-based industrial, commercial, and institutional sites as they implement a robust energy management system based on the global ISO 50001 energy management system standard.

Each cohort will be tailored to meet the needs of participating sites. Generally, cohort program support will include six to twelve months of support from national ISO 50001 experts delivered via monthly cohort group training webinars, monthly virtual one-on-one coaching sessions with each site, on-demand guidance on the use of 50001 Ready tools and resources, and opportunities for peer-to-peer learning.

### Step-by-Step Support

Over the course of the cohort program, you and your cohort will receive free training using DOE developed resources to support your organization as you pursue your energy management path. Cohort training will be tailored to help you develop an energy management system that fits your needs.



### How to Join or Learn More

To join, site leadership commits staff and resources to complete the program and implement an ISO 50001-based energy management system, and then pursue 50001 Ready-recognition for the site.

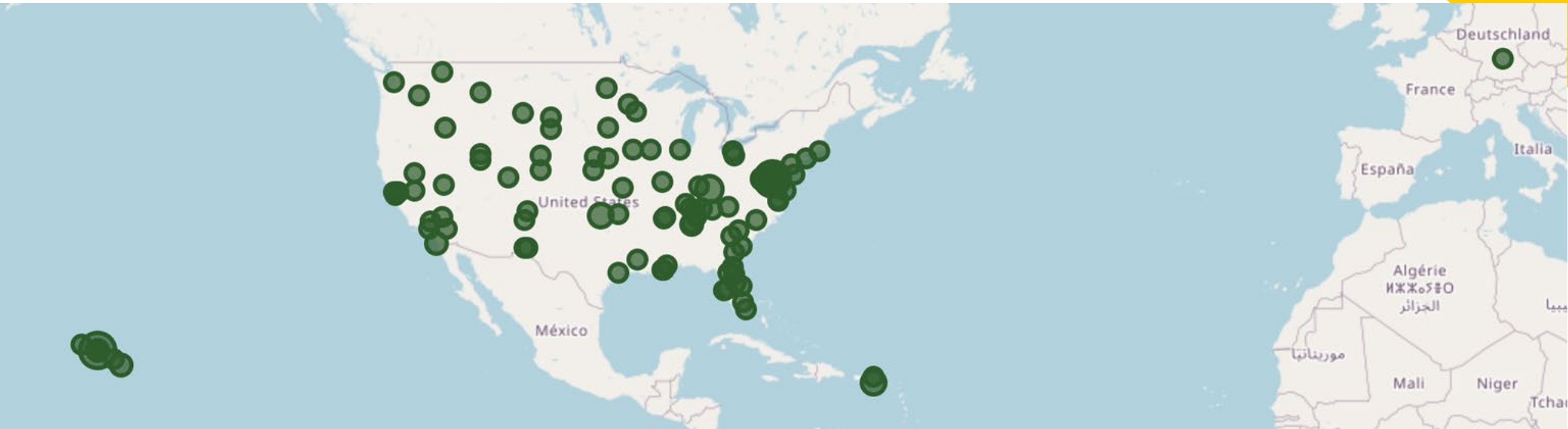
Please send an email to the Help Desk, [50001Ready@lbl.gov](mailto:50001Ready@lbl.gov) to arrange a call to share more information about your site, hear more about the technical assistance available, and learn how to join.

Acceptance is on a first-come/first-served basis.

**ACT SOON** to secure your seat in the next 50001 Ready Cohort!

[www.energy.gov/50001Ready](http://www.energy.gov/50001Ready)

# Federal Sites in 50001 Ready Cohorts

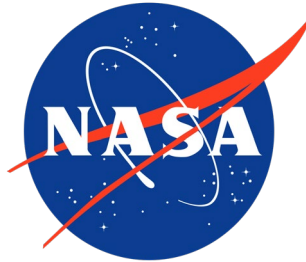


Agencies	Number of Sites Engaged in Program			Participants
	Training	Implementation Track	Total	Total
<u>10</u>	<u>94</u>	<u>53</u>	<u>147</u>	<u>202</u>

# Federal Uptake of 50001 Ready is Growing



**50001 Ready**  
U.S. DEPARTMENT OF ENERGY



147 Federal  
Sites  
Enrolled

40 Federal  
Sites  
Recognized

202 Federal  
Staff Trained

# Observations for Working with Federal Facilities

- Get people involved - share the load!
  - 50001 Ready is the process you can point to that appropriately engages people facility wide
- Bring together all the good practices you do already
  - 50001 Ready PDCA cycle incorporates treasure hunts, audits, metrics...
- Help energy people with their personal needs
  - Early career - a process to learn and follow to build a program
  - Mid career – enhance engagement with management and others, build commitment and access to resources
  - Later career – leave a legacy for the next generation



# Additional Information



**50001 Ready**  
U.S. DEPARTMENT OF ENERGY



For more information email  
[50001Ready@lbl.gov](mailto:50001Ready@lbl.gov)



For more information about 50001 Ready  
[50001Ready.lbl.gov](http://50001Ready.lbl.gov)

Access to the 50001 Ready Navigator  
[Navigator.lbl.gov](http://Navigator.lbl.gov)

# Questions?

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U.S. DEPARTMENT  
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Federal Energy  
Management Program

**FEMP Summer Workshops**



# MEASUR, VERIFI, and JUSTIFI: DOE ITO Software Tools

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Kristina Armstrong





# Kristina Armstrong

Associate R&D Staff, Oak Ridge National Laboratory

# DOE Industrial Software Tools

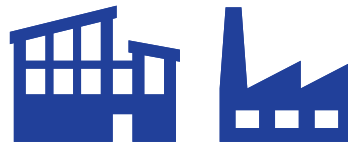
Help energy and sustainability teams identify, understand, and identify opportunities for energy and emission savings in their operations.

## Energy Systems



MEASUR  
JUSTIFI  
Electrification for  
Decarbonization  
Compressed Air Scoping Tool

## Energy Management



VERIFI  
50001 Ready Navigator  
Energy Footprint Tool  
Plant Energy Profiler  
Implementation Guidance Toolkit

## Carbon, Water, & Waste



Plant Water Profiler  
Plant Carbon Footprint &  
Decarbonization Assessment  
Tool (PCFDA)  
Carbon Emissions Calculator  
Waste Stream Energy Content

Learn more about these our at  
<https://industrialresources.ornl.gov/>

# Software Tools help implement energy projects

## 50001 Ready Navigator

## VERIFI

### Energy management

- Resources
- Track progress



### Facility energy use

- Utility bill tracking and analysis
- Utility/ GHG savings analysis

## MEASUR

## JUSTIFI



### System energy use

- Industrial System Analysis
- Treasure Hunts
- Inventory

### Additional impacts

- Financial & performance metrics impacts of energy projects

# MEASUR – Assess equipment's energy efficiency

Helps **identify, assess, and quantify** energy **savings** opportunities in operations and energy support systems.

- FREE & Open source, cross-platform tool
- Technology and vendor agnostic
- Private data & Global useability
- Key User Features
  - Similar workflow for all assessment modules
  - Graphs, figures, accessible help text & examples
  - Regular updates

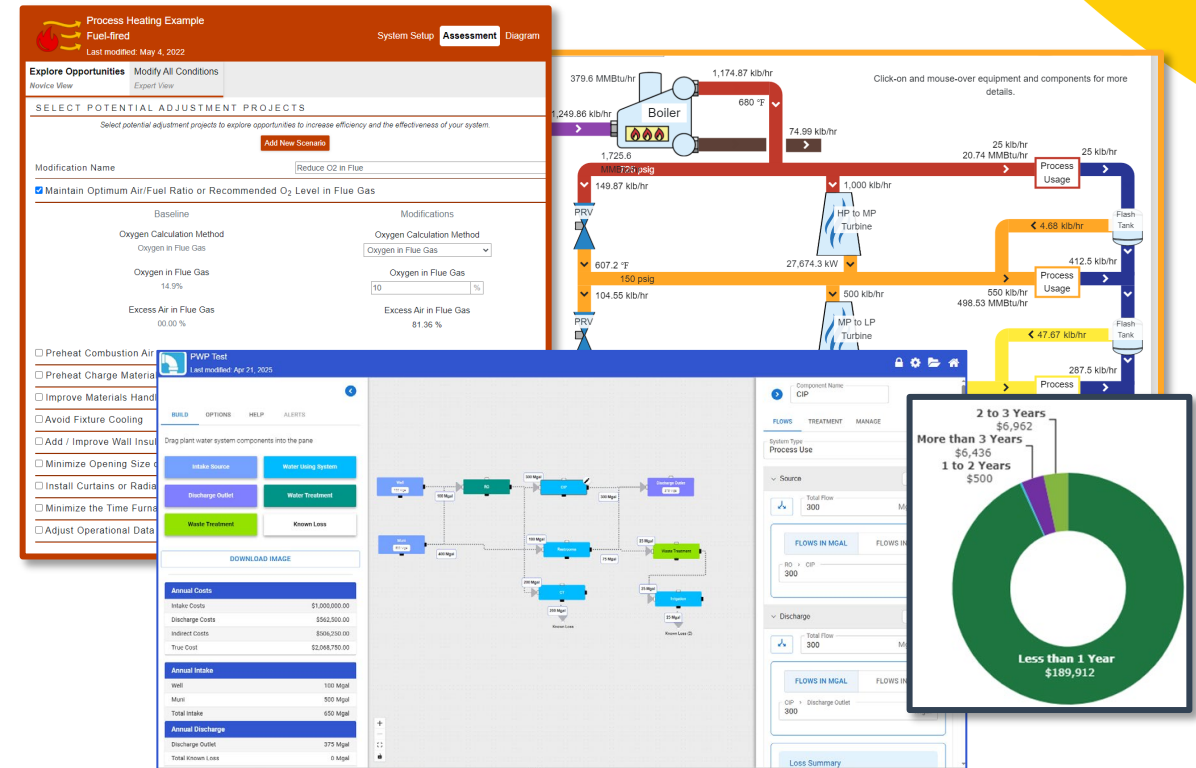


Find this tool at  
<https://measur.ornl.gov>

# MEASUR – Understand system-level energy use

8 assessment modules, plus equipment inventory and data analysis modules, and 80 standalone calculators!

- Assessment Modules
  - Pumps, Fans, Process Heating, Compressed Air, Steam, Wastewater, Water, and Treasure Hunt
  - Baseline and What-if Analyses
  - Explore energy, cost, and emissions impact of projects
- Other Modules
  - **Motor & Pump Inventories** (others coming soon)
  - **Data Analysis** (day type & visual analyses)



Find this tool at  
<https://measur.ornl.gov>

## MEASUR – Conduct an assessment

## Create a baseline

Enter data about current system setup

## Enter data about current system setup

## Create an assessment

Modify key variables to create  
What-if scenarios and compare

## Create an assessment

Modify key variables to create  
What-if scenarios and compare

## Review

### Results & Reports

## Review

### Results & Reports



# MEASUR – Calculators for quick calculations

80 calculators

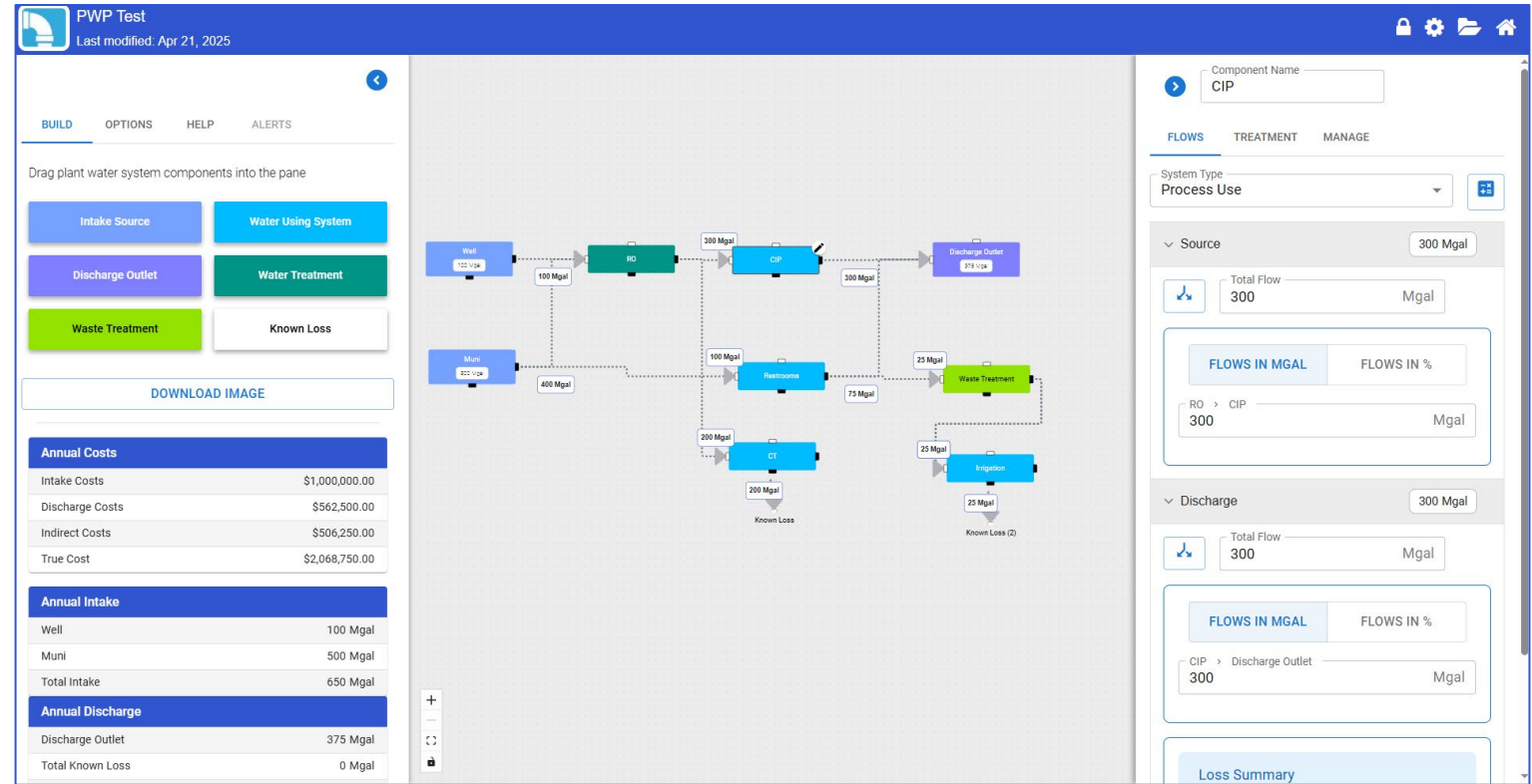
- Motors
- Pumps
- Fans
- Process Heating
- Process Cooling
- Steam
- Compressed Air
- Lighting
- General

Most have graphical results



# MEASUR – Water Diagram & Assessment

- **Build** a water use diagram of site
- **Balance** water flows across systems and facility
- **Understand** actions done to water (treatment, heating, pumping)
- **Establish** the true cost of water use at site





# MEASUR – Treasure Hunt

MEASUR provides a simple way to organize data and estimate results from a Treasure Hunt

Sample Treasure Hunt  
Last modified: Mar 7, 2024

Facility Basics Find Treasure Treasure Chest Report

Find ways to save your hard earned treasure!  
Use one of the following calculators to determine savings opportunities within your manufacturing facility.  
Once an opportunity has been found, save the opportunity to your "Treasure Chest".  
Add more details to each opportunity by clicking the icon and filling out an opportunity sheet.  
Click the "Treasure Chest" tab to view a summary of your found treasure.

Filter Calculators by Utility Type All

Electricity Reduction  
This calculator is used to quantify the energy savings associated with reducing electricity usage.

Replace Existing Motor  
This calculator calculates the energy savings, cost savings, and payback period for replacing an existing motor with a higher efficiency motor.

Upgrade Motor Drive  
The Motor Drive Calculator compares the annual energy cost of three motor drives: V-belt drive, Notched V-Belt drive, and Synchronous Belt Drive.

Lighting Replacement  
The calculator is designed to quantify the energy savings associated with lighting opportunities.

Fixture #1

Operating Hours 8760 hrs/yr

Fixture Category Metal Halide

Fixture type 400-W Metal Halide

Lamp Life 20,000 hrs

Watts Per Lamp 400 W/lamp

Ballast Factor 1.15

Lamps Per Fixture 1

Number of Fixtures 200

Hide Lighting Level Details -

Lumens Per Lamp 26000 lm/lamp

Coefficient of Utilization 0.45

Lumen Degredation Factor 0.8696

1

Setup Baseline Utility Use

2

Choose from 29 calculators to identify and quantify opportunities

3

Review Results & reports

Sample Treasure Hunt  
Last modified: Mar 13, 2024

Facility Basics Find Treasure Tr

Assessment Basics Energy Usage and Cost

ANNUAL UTILITY USAGE AND COSTS

Electricity

Electricity Unit Cost 0.066 \$/kWh

Estimate Unit Cost

Electricity Annual Consumption 0 kWh

Estimate Annual Consumption

Electricity Annual Cost 0 \$

Estimate Annual Cost

Total CO<sub>2</sub> Emission Output Rate 0.40107 kg CO<sub>2</sub>/kWh

Calculate Emission Output Rate from zip code

Total Cost Savings (\$)

6.6%

Baseline 1,750,000

Modified 1,633,946

Annual Savings 116,054

CO<sub>2</sub> Emissions Savings (tonne CO<sub>2</sub>)

6.1%

Baseline 8,287

Modified 7,784

Annual Savings 503

Electricity Cost Savings (\$)

11.3%

Baseline 1,000,000

Modified 886,928

Annual Savings 113,072

Natural Gas Cost Savings (\$)

0.4%

Baseline 750,000

Modified 747,018

Annual Savings 2,982

Sample Treasure Hunt  
Last modified: Mar 8, 2024

Facility Basics Find Treasure Treasure Chest Report

Executive Summary

Cost Summary

Utility	Cost Savings (\$)	Implementation Cost (\$)	Payback
Electricity	113,072	\$5,000	0.49
Natural Gas	2,982	15,000	5.03
Total	116,054	135,000	1.16

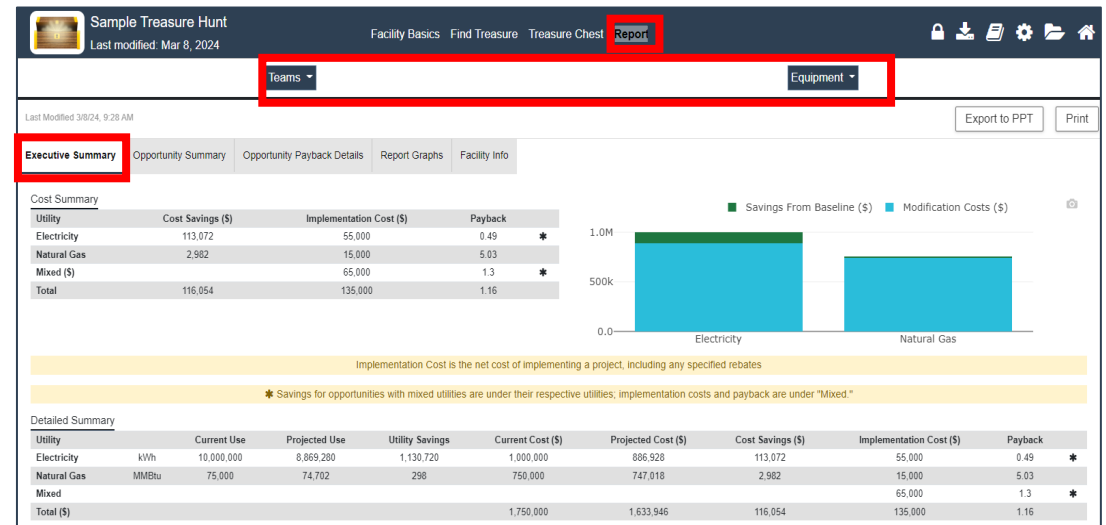
Facility Summary

Utility	Current Use	Projected Use	Utility Savings	Current Cost (\$)	Projected Cost (\$)	Cost Savings (\$)	Implementation Cost (\$)	Payback
Electricity	kWh 10,000,000	8,869,280	1,130,720	1,000,000	886,928	113,072	55,000	0.49
Natural Gas	Mcf 75,000	74,702	298	750,000	747,018	2,982	15,000	5.03
Total				1,750,000	1,633,946	116,054	135,000	1.16

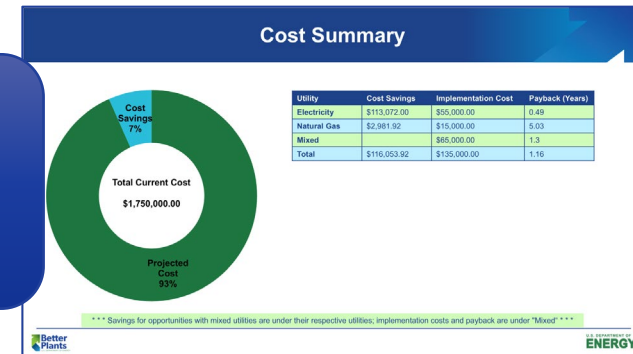
U.S. DEPARTMENT of ENERGY | Federal Energy Management Program

# Treasure Hunt Reports

- **Executive Summary** has high level savings, costs, and payback results.
- **Opportunity Summary** provides a breakdown of all the opportunities you selected.
- **Export Project Tracker** will create an Excel file for you to track implementation progress.
- **Opportunity Payback Details** provides graphs about payback
- **Report Graphs** features pie charts breaking down savings and the Effort to Implement graph



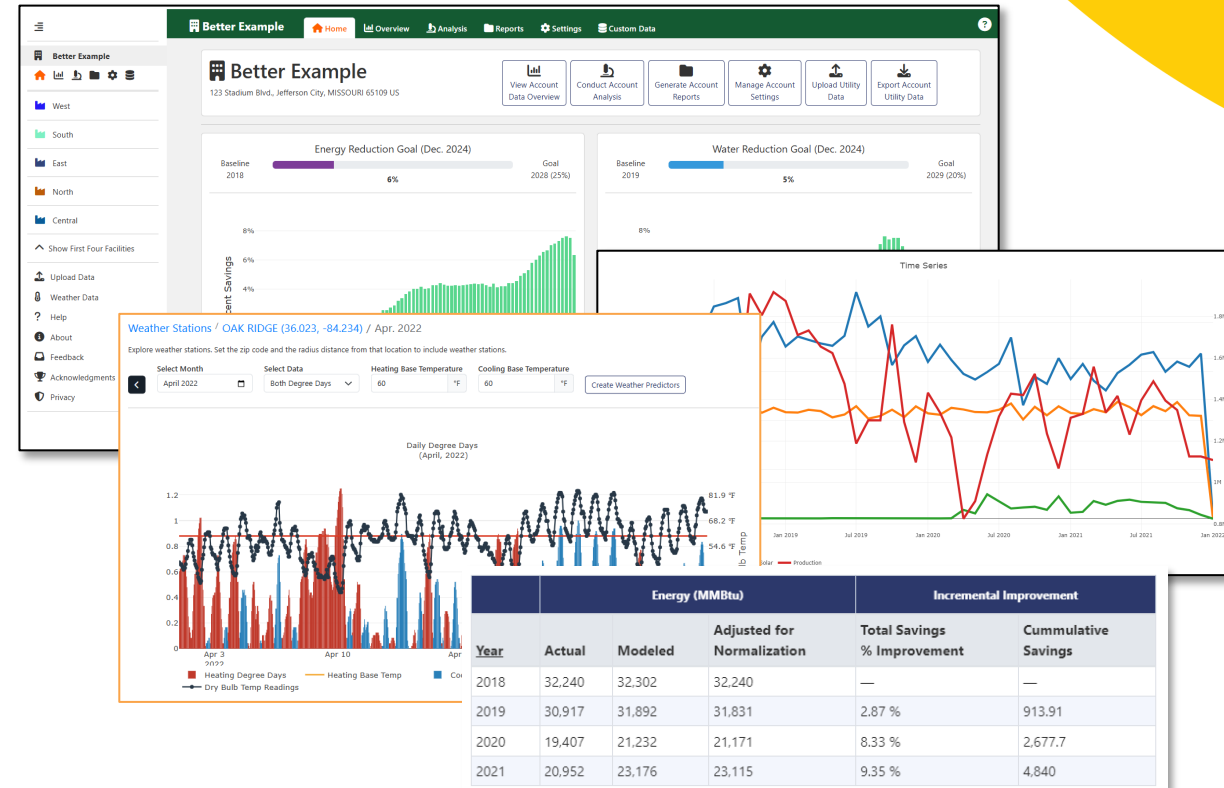
Create  
PowerPoint  
Report-out!



# VERIFI – Understand facility-level energy use

Helps understand, visualize, and analyze utility bills and quantify utility reductions for multiple sites.

- FREE & Open source, Cross-platform tool
- Private Data & Global Useability
- Key User Features
  - Utility bill tracking, calendarization, visualization
  - Energy, water, emission reduction analysis and reports
  - Weather data for U.S. + more
  - Accessible help text & examples + Regular updates



Find this tool at  
<https://verifi.ornl.gov/>

# VERIFI – Create energy / water savings analyses

1

Setup basic info

South Facility

Home Utility Data Overview Data Visualization Analysis Settings

Analysis Setup

Name: South Analysis Baseline Year: 2018

Energy displayed as site or source? ☒ Source Energy ☐ Site Energy Reporting Year: Calendar Fiscal Year

Energy Unit: Million British Thermal Units (MMBT) Fields set in "Settings" tab

Report Year: 2021

Choose Analysis Type

2

Analysis Options Regression Model Annual Analysis Monthly Analysis

Natural Gas Setup

1. Select Analysis Type

- ☐ Absolute Energy Consumption
- ☐ Energy Intensity
- ☐ Modified Energy Intensity
- ☒ Regression

2. Add Baseline Adjustment

Has Baseline Adjustment ☐

3

Regression made easy!

Analysis Setup Electricity Natural Gas Facility Summary Account Analysis

Analysis Options Regression Model Annual Analysis Monthly Analysis

Natural Gas Regression Model

Select Modeling Method: Calculate Models

Update Models

Current Models Generated: 1/10/23, 3:41 PM

Show Invalid Models ☐

Regression Model

Analysis Variables: CDD, HDD, Production

Use For Analysis: ☒ CDD, ☒ HDD, ☒ Production

Regression Coefficient: CDD: 0, HDD: 0.4291568274087638, Production: 0

Regression Constant: 102.12077904339644

Model Year: 2021

Additional Model Notes

Select Model	Model Year	Variable p-Values	Adjusted R2	Model p-Value	Formula	Model Notes
<input checked="" type="radio"/>	2021	HDD: 0.00	0.582 0.540	0.00	102 + (0.429*HDD)	No production variable in model
<input type="radio"/>	2021	Production: 0.01	0.553 0.508	0.01	880 + (-0.0219*Production)	Production coef < 0
<input type="radio"/>	2018	HDD: 0.01 Production: 0.17	0.591 0.500	0.02	901 + (0.603*HDD) + (-0.0186*Production)	Production coef < 0 Adjusted R2 < .5
<input type="radio"/>	2020	CDD: 0.02 Production: 0.09	0.583 0.490	0.02	160 + (-0.435*CDD) + (0.00550*Production)	CDD coef < 0 Adjusted R2 < .5

4

View results!



5

Combine multiple sites

VERIFI

Better Plants Example Home Overview Analysis Reports Settings Custom Data

Analysis Setup Select Facility Items Analysis Results All Account Analysis

West Facility South Facility East Facility North Facility San Facility

South Facility Analysis Items

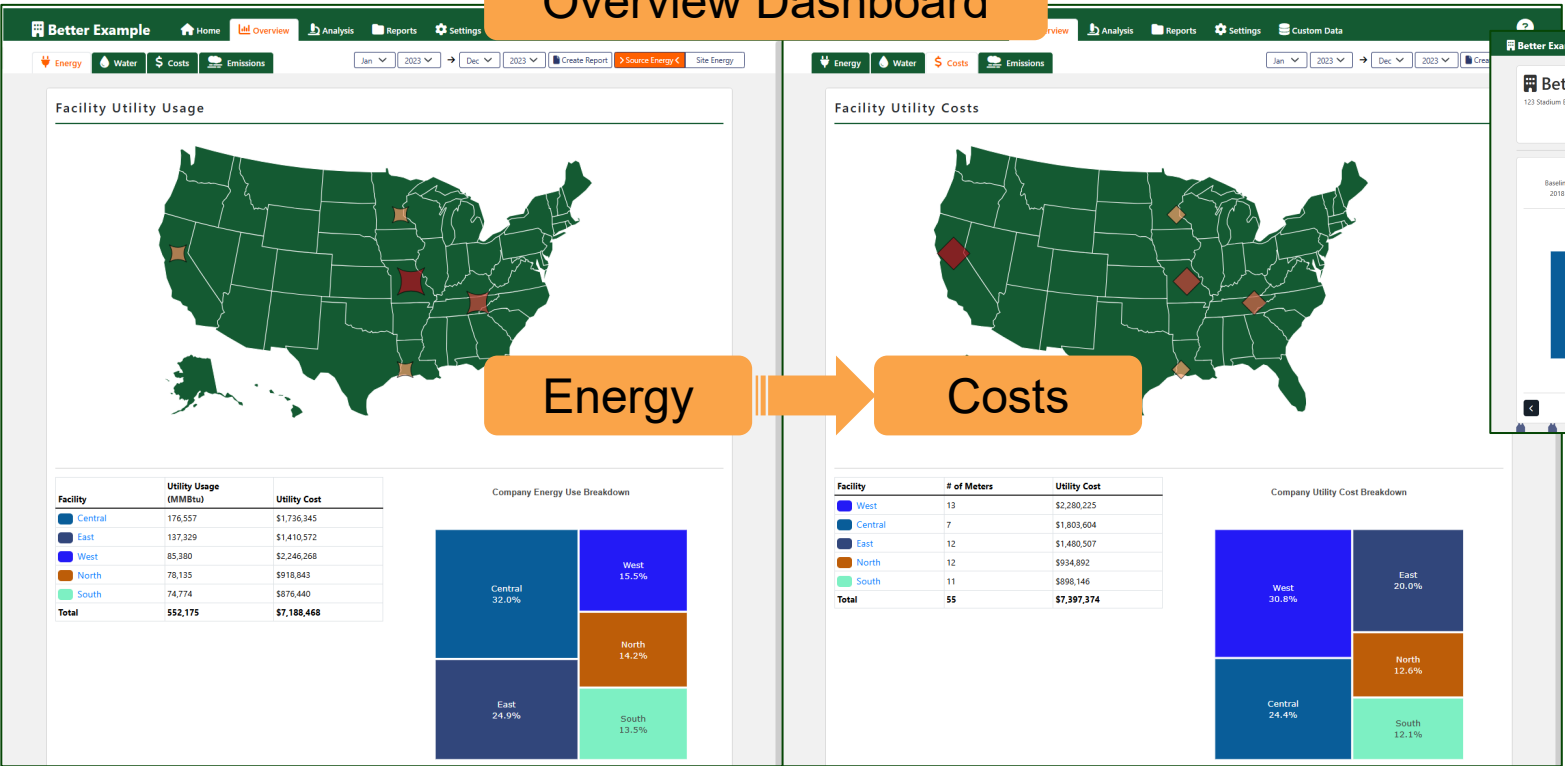
Analysis Item	Group Analysis	Last Modified
Electricity Energy Intensity	Electricity Energy Intensity	1/10/23, 3:41 PM
Natural Gas Regression	Natural Gas Regression	1/10/23, 3:41 PM

Back

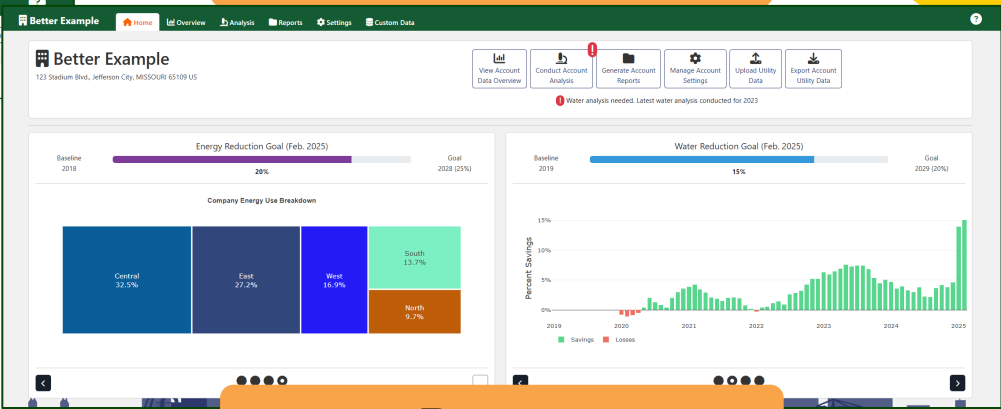
ENERGY Energy Efficiency & Renewable Energy

# VERIFI – Dashboards & Reports

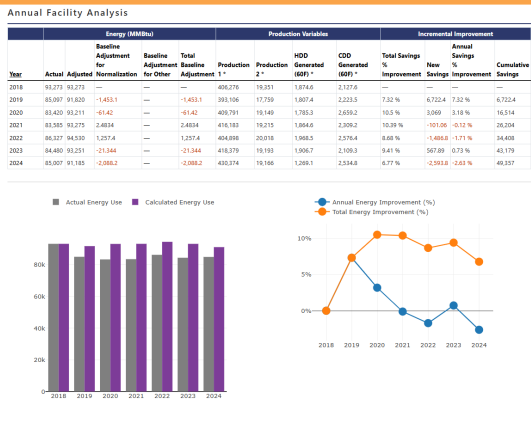
Overview Dashboard



Home Dashboard



Reports



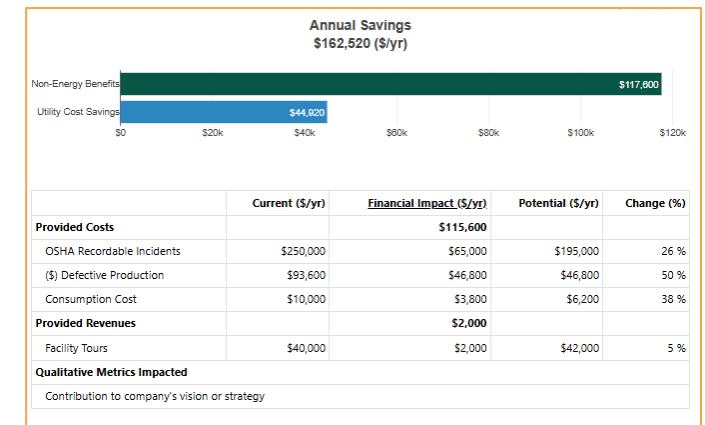
Several Dashboards & Reports to help keep an eye on energy, other utility, cost reduction efforts

# JUSTIFI – Understand additional impacts

Helps **identify, assess, and quantify** the **non-energy benefits (NEBs)** of energy efficiency opportunities to **improve financial impact** estimations of projects.

- FREE & Open source, Cross-platform tool
- Private Data & Global Useability
- Key User Features
  - Identify stakeholders, KPIs/KPMs, Equipment, End Uses
  - Use to find and quantify NEBs
  - Graphs & Figures!
  - Accessible help text and examples

Available at  
<https://justifi.ornl.gov>



# JUSTIFI – Quantify impacts on KPIs

Wizard guides you through data entry

- Pre-visit
  - Stakeholders
  - KPIs & KPMs
  - Industrial System & End Use Inventories
- Assessment
  - EEMs: energy saved and cost
  - NEBs: understand impacts on KPMs
- Create connections as you conduct assessments and talk to key personnel

The screenshot displays the JUSTIFI software interface, which is divided into several panels. The top-left panel, titled 'Facility Key Performance Indicators (KPIs)', features a search bar and a list of categories including Workforce Development, Working Environment, Material Utilization, Waste, Customer Satisfaction, Sales Growth, Quality, Safety, Productivity, Strategic Relationship Impact, Water Consumption, Facility Tours, Maintenance Expense, Expense Cost, Machine Utilization, and Air and environmental quality. The top-right panel, titled 'Steam Assessment', shows a 'Non-Energy Benefits' section with options like 'Reduced burns (tank)', 'Reduce Scope 1 & Scope 2 Emissions', and 'Reduce water consumption'. Below this is a 'Key Performance Metric Impacts' section. The bottom-left panel, titled 'Boiler 1', contains fields for 'Equipment Name', 'Industrial System', and 'Notes', along with a 'Stakeholders' dropdown and a list of 'End Uses' including Steam lines, Melted Chocolate Tank, and Barring line. The bottom-right panel, titled 'End Uses Inventory & Connections', lists various components like Boiler 1, Simran Steam, Barring Room Lights, and Barring line. The rightmost panel shows a table of 'End Uses Inventory & Connections' with columns for 'Metric Type', 'Consumption Cost', 'Metric Type', 'Expected Impact', 'Impact Calculation Method', 'Unit', 'Baseline Amount', 'Cost Per Unit', 'Baseline Cost', 'Impact on KPM', and 'Financial Impact'.

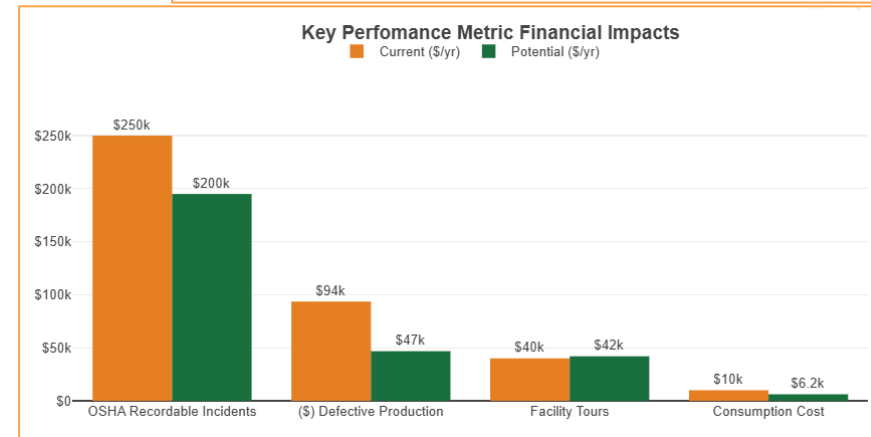
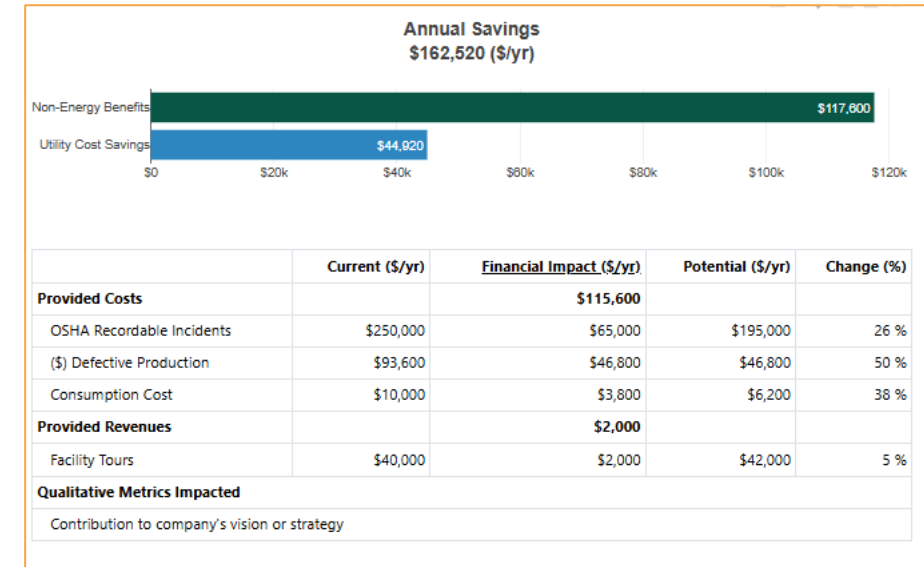
Metric Type	Consumption Cost	Metric Type	Expected Impact	Impact Calculation Method	Unit	Baseline Amount	Cost Per Unit	Baseline Cost	Impact on KPM	Financial Impact
Qualitative		Quantitative	Decrease Costs	Cost Per Unit	gal	5000000	0.002	\$10,000.00/yr	- 1900000	- \$3,800.00/yr



# JUSTIFI – Quantify financial & business impacts

- **View impacts** of EEMs on identified KPIs and KPMs
- See **increase in cost savings** and reduction in payback period
- **Reports** for different engagement levels (Executive Summary, Detailed report, KPI report)

	Implementation Cost (\$)	Cost Savings (\$/yr)	Financial Impact With NEBs (\$/yr)	Simple Payback (yrs)	Simple Payback With NEBs (yrs)
Steam Assessment	—	\$44,920	\$91,720	—	—
Insulate Melted Chocolate Tank	\$50,000	—	\$57,000	—	0.88
Steam Leaks at HP & LP	\$2,500	—	\$10,000	—	0.25
Condensate Recovery	\$50,000	—	\$3,800	—	13.16
<b>Assessment Total</b>	<b>\$102,500</b>	<b>\$44,920</b>	<b>\$162,520</b>	<b>2.28</b>	<b>0.63</b>





# Questions?

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U.S. DEPARTMENT  
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Federal Energy  
Management Program

**FEMP Summer Workshops**

# This Training Is Accredited

How to obtain your CEUs:

1. Log in to <https://edu.wbdg.org/> using your WBDG credentials
  - The assessment and evaluation will be made available to attendees at 8:00am ET on Monday, August 11<sup>th</sup>
  - The assessment and evaluation will close on September 22<sup>nd</sup>
2. In the list of trainings you attended, click on the Visit link by the course you wish to complete
  - If the course you're looking for is not listed, click on My Account in the top right menu
  - If you still can't find your course, contact the WBDG support team to check your eligibility
3. Complete the assessment with a score of 80% or above
4. Upon passing the assessment, click the Post-Evaluation Survey button
5. Complete and submit the evaluation
6. Click Download Your Certificate to generate your certificate of completion, which can be downloaded for your records

Questions or issues? Contact WBDG Support at [wbdg@nibs.org](mailto:wbdg@nibs.org).



## What's an IACET CEU?

A continuing education unit (CEU) from the International Association for Continuing Education and Training (IACET) equals 10 hours of learning in an approved program for licensed or certified professionals.

# Thank You

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U.S. DEPARTMENT  
*of* **ENERGY**

Federal Energy  
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**FEMP Summer CAMP** (Courses Aligned with Mission Priorities)

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