



## **DOE Resources to Improve Resource Efficiency, and Competitiveness**

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CIBO 2025 Policy & Technical Issues Conference  
Kingsport, TN  
Tuesday, May 13

# Hot Topics

Efficiency is Foundational!

Energy touches many areas!

Corporate Goals

Net Zero / Carbon Neutral

Science Based Targets (~10.4k)

Reporting

CDP (24k+), TCFD (3.8k), etc

CBAM and Competitiveness!

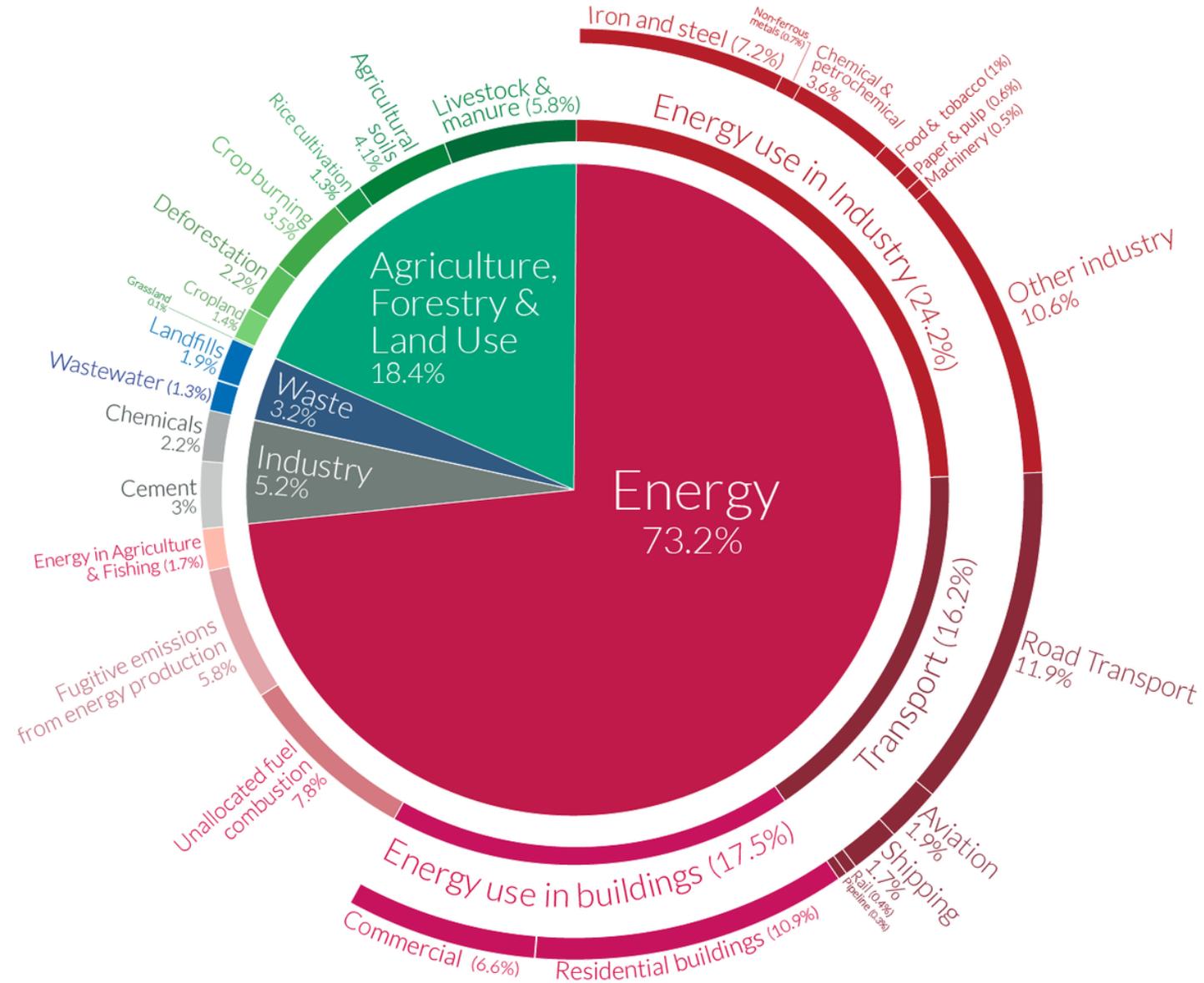
Roadmapping & Action Plans

How are you going to get there?

Change is the Expectation

# Global greenhouse gas emissions by sector

This is shown for the year 2016 – global greenhouse gas emissions were 49.4 billion tonnes CO<sub>2</sub>eq.



# What are the DOE Programs?

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The Better Buildings, Better Plants (BBBP) Program partners with leading organizations to **improve energy efficiency and competitiveness, saving money in the process.**

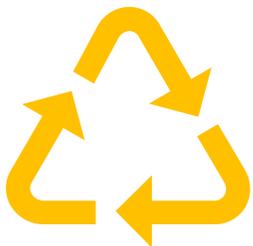
Through BBBP, partners voluntarily set a specific goal, typically to **reduce energy intensity** by 25% and/or GHG emissions by 50% over a 10-year period across all their U.S. operations.



**Increased Energy  
Productivity**



**Water  
Savings**



**Waste  
Reduction**



**Decarbonization  
(Better Climate Challenge)**

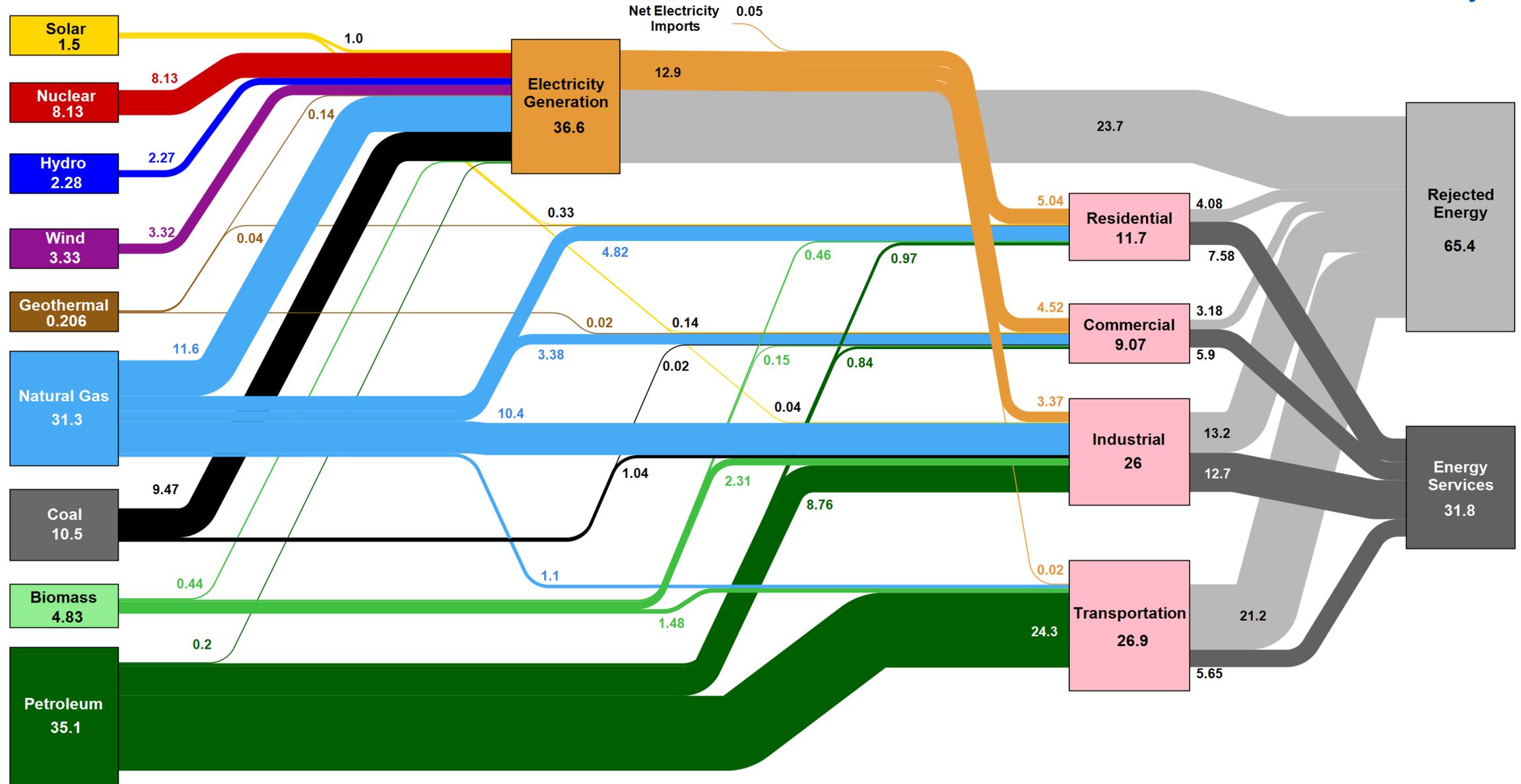
# Why Focus on Industrial Energy Efficiency?

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- Manufacturers spend \$200 billion per year on energy to operate their facilities
- DOE data demonstrates that most plants have big opportunities to reduce energy use with relatively short payback periods
- Industrial energy efficiency helps build national resiliency, economic competitiveness, and a stronger workforce

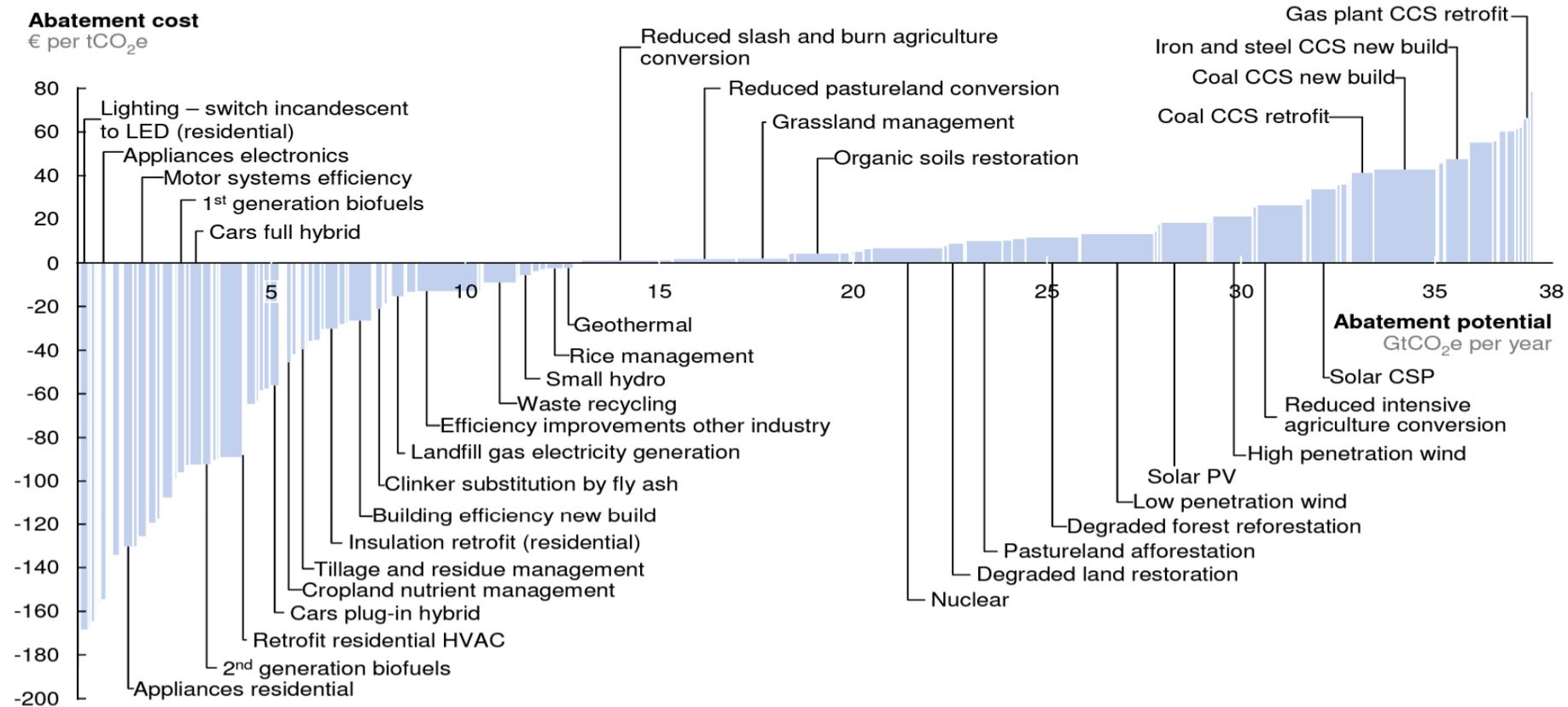
# Estimated U.S. Energy Consumption in 2021: 97.3 Quads



Source: LLNL March, 2022. Data is based on DOE/EIA MER (2021). If this information or a reproduction of it is used, credit must be given to the Lawrence Livermore National Laboratory and the Department of Energy, under whose auspices the work was performed. Distributed electricity represents only retail electricity sales and does not include self-generation. EIA reports consumption of renewable resources (i.e., hydro, wind, geothermal and solar) for electricity in BTU-equivalent values by assuming a typical fossil fuel plant heat rate. The efficiency of electricity production is calculated as the total retail electricity delivered divided by the primary energy input into electricity generation. End use efficiency is estimated as 65% for the residential sector, 65% for the commercial sector, 21% for the transportation sector and 49% for the industrial sector, which was updated in 2017 to reflect DOE's analysis of manufacturing. Totals may not equal sum of components due to independent rounding. LLNL-MI-410527

# McKinsey Marginal Abatement Curves

## V2.1 Global GHG abatement cost curve beyond BAU – 2030



Note: The curve presents an estimate of the maximum potential of all technical GHG abatement measures below €80 per tCO<sub>2</sub>e if each lever was pursued aggressively. It is not a forecast of what role different abatement measures and technologies will play.

Source: Global GHG Abatement Cost Curve v2.1

Source: Per-Anders Enkvist, Jens Dinkel, and Charles Lin, Impact of the financial crisis on carbon economics: Version 2.1 of the Global Greenhouse Gas Abatement Cost Curve, McKinsey & Company, 2010.

# What Market Leadership Looks Like



# How Does Better Plants Work?

- Joining the program is voluntary and there is no cost to participate.
- Partners set long-term and strategic energy, water, and waste reduction goals.
- DOE works with partners to achieve their energy, water, and waste reduction goals.



# Why Companies Participate in Better Plants

## Industry Leadership

### Developing Innovative, Replicable Solutions with Market Leaders

- National Recognition
- Peer to Peer Networking
- Better Building Solutions Center
- Better Project and Practice Awards
- Working Groups

## Technical Assistance Resources

### Making Energy Efficient Investments Easier

- Tools for Energy Management
- Financing Navigator
- Diagnostic Equipment Program
- Onsite Technical Assistance Partnerships
- 50001 Ready Assistance
- Technical Account Managers

## Emerging Technologies

### Innovation to Drive Savings

- DOE National Labs
- Better Plants Technology Days
- Advanced Technology Field Validation

## Workforce Development

### Helping You Meet Your Challenges of Today, and Tomorrow

- In-Plant and Virtual Trainings
- Energy and Decarbonization Bootcamps
- Industrial Assessment Centers





# Technical Assistance and Resources Available from Better Plants

# Technical Account Managers (TAMs)

- Technical Account Managers (TAMs) help partners develop a roadmap to achieve their energy, waste, and water goals.
- TAMs help partners set energy baselines, track data, and identify energy savings opportunities.
- They also help inform partners about DOE and external resources.



**“The TAMs are like having a free consultant on retainer”**

--Andy Terrey, City of Phoenix Water Services

# What Tools Can You Use Through Better Plants?

## NO-COST SOFTWARE & TOOLS

Access to no-cost software and tools to identify and implement energy saving opportunities and manage energy use.



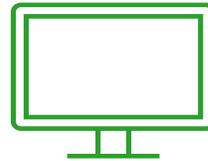
**60+**  
Calculators



**20+** No-Cost  
Tools for Loan



Financing  
Navigator



Solution  
Center



No-Cost  
Resources  
& Guides

# DOE Software Tools

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

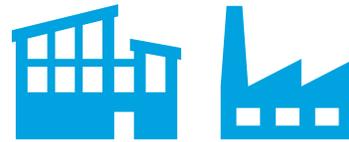
## Energy Systems



### MEASUR

Electrification for Decarbonization  
Compressed Air Scoping Tool  
Financing Navigator

## 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  
Carbon Emissions Calculator  
Waste Stream Energy Content

# No-Cost Software: MEASUR Software Suite



## (Manufacturing Energy Assessment Software for Utility Reduction )

- Energy management software tool to help manufactures improve the efficiency of specific systems and pieces of equipment within a plant
- Model common energy systems and evaluate unlimited “What-if” Scenarios
  - Perform full assessments for Steam, Process Heating, Pumps, Fans, Compressed Air, Treasure Hunt, and Wastewater
  - Evaluate system efficiency
  - Identify major areas of energy use and savings
  - Easily quantify energy and cost savings potential
  - Dynamically create and save custom reports
  - Includes extensive help text and built-in guidance
- 75+ simple standalone calculators
  - Quantify savings for common basic opportunities
  - Perform your own facility Treasure Hunt

The screenshot displays the MEASUR software interface. At the top, it shows the U.S. Department of Energy logo and the text 'Energy Efficiency & Renewable Energy'. The main window is titled 'Reheat Furnace Case Study' and includes tabs for 'System Setup', 'Assessment', and 'Diag'. Below the title bar, there are sections for 'Explore Opportunities' and 'SELECT POTENTIAL ADJUSTMENT PROJECTS'. A table lists various modification options, such as 'Maintain Optimum Air/Fuel Ratio or Recommended O<sub>2</sub> Level in Flue Gas', with associated parameters and values. To the right, a 'Welcome' message introduces the software and provides navigation buttons for 'View Assessments' and 'Equipment Calculators'. Below this, there are icons for 'Pump Assessment', 'Compressed Air Assessment', 'Process Heating Assessment', 'Fan Assessment', and 'Steam Assessment'. The bottom portion of the screenshot shows a detailed process flow diagram with various equipment components like a boiler, turbines, and pumps, along with associated energy flows and values.

<https://www.energy.gov/eere/amo/measur>

(Available for Windows, Mac & Linux)

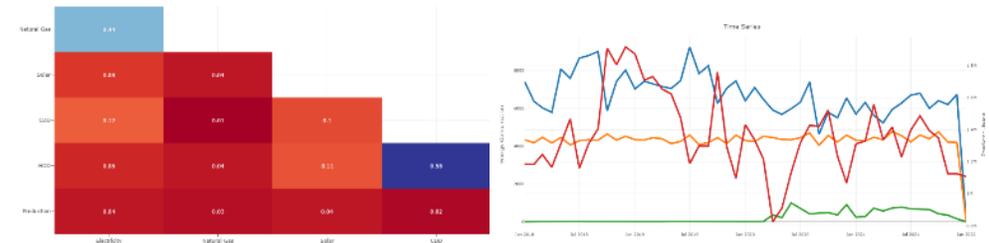
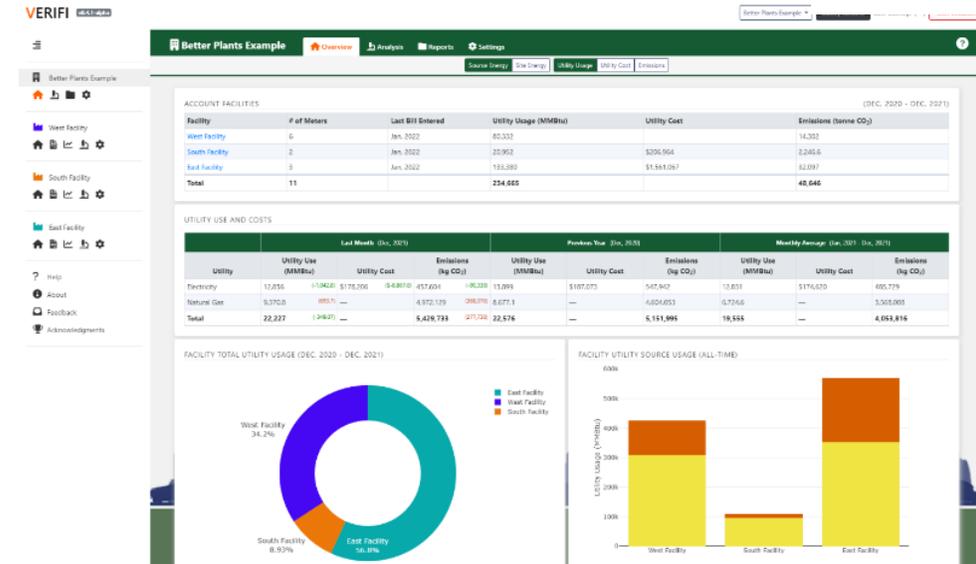
# No-Cost Software: VERIFI



- **Utility Dashboard and Analysis Tool**

- Corporate and facility-level views
- Enter utility bills and see total energy use in a new way
  - Calendarization of energy data
  - Annual cost, energy use, and carbon emissions overview
- Analyze your data and generate a Better Plants Annual Reporting Form or other custom reports
- Quickly normalize using regression
- Produces GHG emissions reports

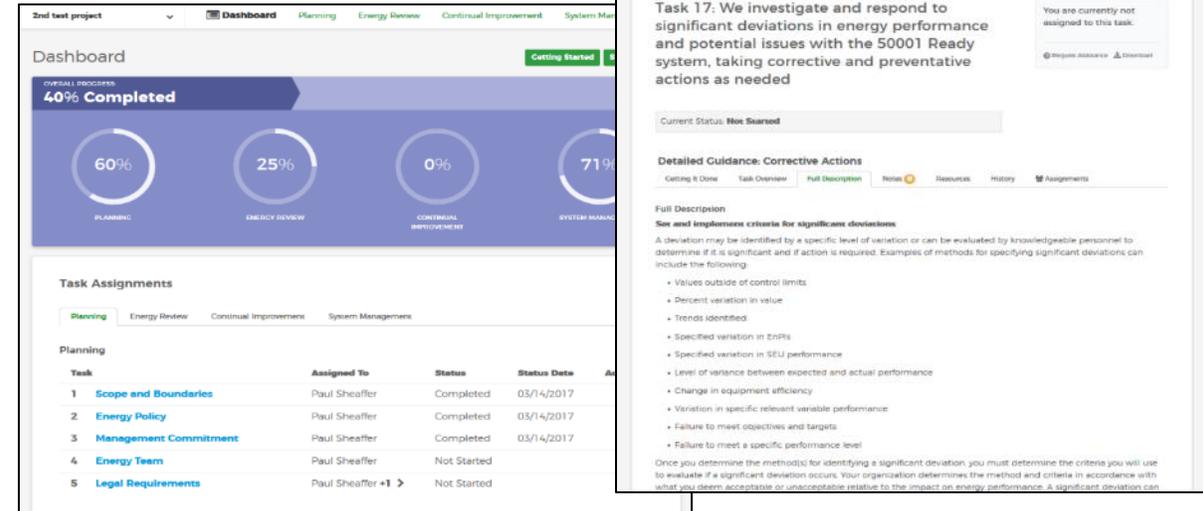
- **Simplify and standardize** data entry, tracking, benchmarking and baselining for companies
- **Streamlines reporting** for companies



|      | Energy (MMBtu) |         |                            | Incremental Improvement     |                     |
|------|----------------|---------|----------------------------|-----------------------------|---------------------|
| Year | Actual         | Modeled | Adjusted for Normalization | Total Savings % Improvement | Cummulative Savings |
| 2018 | 32,240         | 32,302  | 32,240                     | —                           | —                   |
| 2019 | 30,917         | 31,892  | 31,831                     | 2.87 %                      | 913.91              |
| 2020 | 19,407         | 21,232  | 21,171                     | 8.33 %                      | 2,677.7             |
| 2021 | 20,952         | 23,176  | 23,115                     | 9.35 %                      | 4,840               |

# No-Cost Software - 50001 Ready Navigator

- ✓ Step-by-step “Turbo Tax” approach to ISO 50001
- ✓ 25 tasks divided into 4 sections
- ✓ Extensive guidance available in each module
- ✓ Self-attest to completion of 50001 Navigator
- ✓ Create teams and track task progress
- ✓ Over 100 templates & resources



# Explore Trainings and Expert Guidance from Better Plants

## TRAINING & EDUCATION



### In-Plant Trainings Conducted to Date

Multi-day trainings for staff to identify, implement, and replicate energy savings projects.



### No-Cost Webinars & Growing

# Announcement: 2025 In-Plant Trainings (INPLTs)

| Host Plant Name                      | City, State         | Energy System Topic |
|--------------------------------------|---------------------|---------------------|
| Autoneum North America*              | Jeffersonville, IN  | Treasure Hunt       |
| Billerud Americas Corporation*       | Escanaba, MI        | Steam               |
| Dura-line, an Orbia business*        | Salt Lake City, UT  | Treasure Hunt       |
| Frito-Lay Inc.*                      | Frankfort, IN       | Steam               |
| FXI, Inc.*                           | Fort Wayne, IN      | Treasure Hunt       |
| Hemlock Semiconductor (HSC)*         | Hemlock, MI         | Treasure Hunt       |
| Hill and Smith Group Holdings, Inc.* | Alum Bank, PA       | Treasure Hunt       |
| HNI Corporation*                     | Muscatine, IA       | Process Heating     |
| JSW Steel USA*                       | Mingo Junction, OH  | Compressed Air      |
| Narragansett Bay Commission*         | East Providence, RI | Multi-system        |
| Novelis Inc.*                        | Oswego, NY          | Process Heating     |
| Owens Corning*                       | Laurel, MS          | Compressed Air      |
| RTX*                                 | Melbourne, FL       | Water Efficiency    |
| Saint-Gobain Corporation*            | Avery, OH           | Steam               |
| Sierra Nevada Brewing Co.*           | Fletcher, NC        | Treasure Hunt       |
| TE Connectivity*                     | Harrisburg, PA      | Treasure Hunt       |
| Westinghouse Electric Company        | Blairsville, PA     | Treasure Hunt       |

\*Denotes In-Plant Trainings that are open to external participants

We are pleased to announce **17 new host organizations for [In-Plant Trainings \(INPLTs\)](#)**.

These Better Plants partners were recently selected, and trainings will occur in the first half of 2025.

Thanks to all the partners who applied, and congratulations to the following partners for their ongoing commitment to saving energy!

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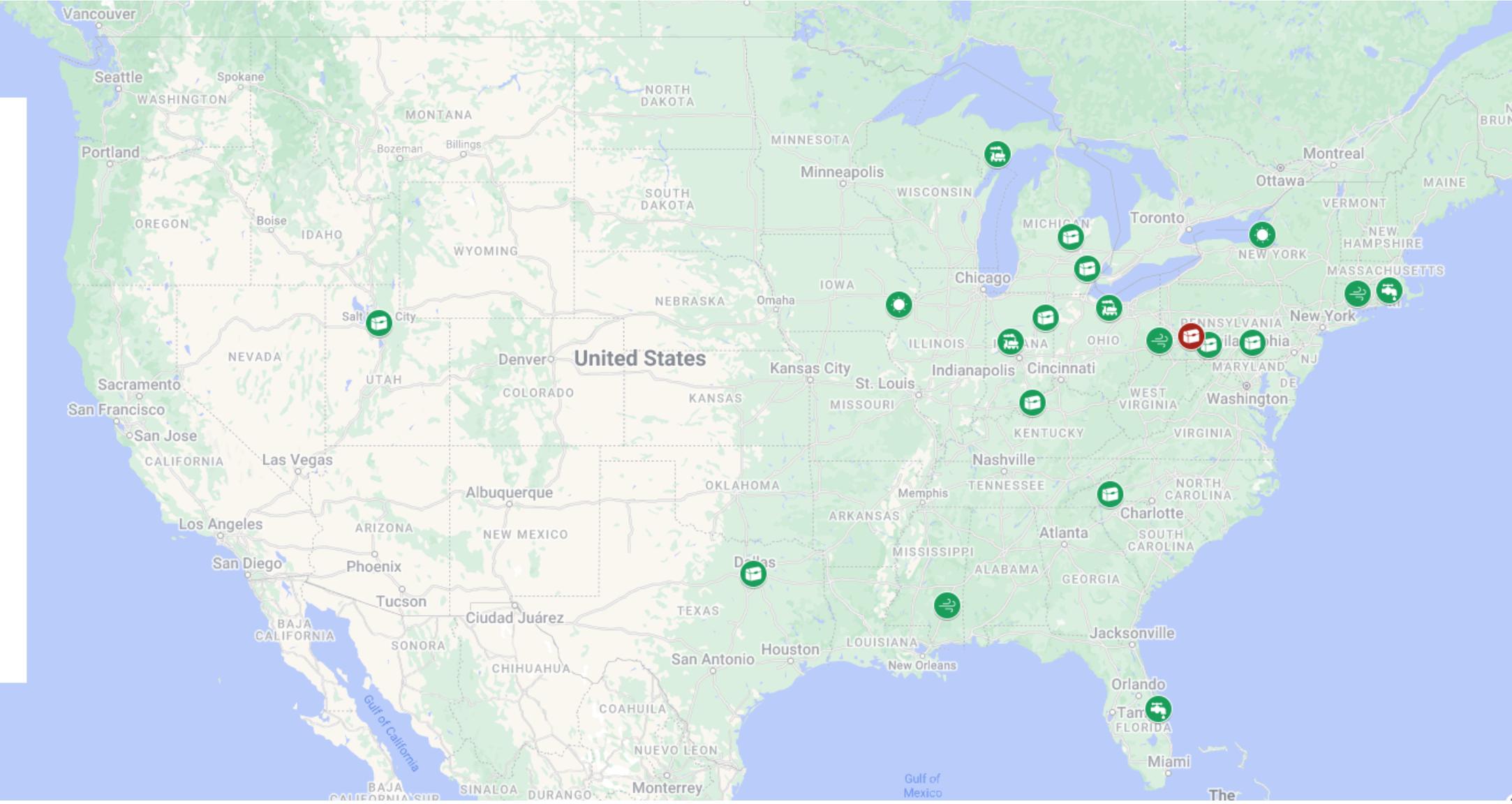
If you are interested in attending one of these INPLTs, please contact your Technical Account Manager.

If you are interested in hosting an INPLT in the future, the next application period opens on **March 31, 2025**.

# Awarded INPLT Locations

## 2025 InPLT Trainings (Round 1)

-  (TH) Autoneum North America
-  (TH) Comau Inc.
-  (TH) Dura-Line Corporation
-  (TH) FXI, Inc.
-  (TH) Gibraltar Industries
-  (TH) Hemlock Semiconductor
-  (TH) Hill and Smith Group
-  (TH) Sierra Nevada Brewing
-  (TH) TE Connectivity
-  (TH) Westinghouse Electric C...
-  (S) Billerud Americas Corpora...
-  (S) Frito-Lay, Inc.
-  (S) Saint-Gobain Corporation
-  (PH) HNI Corporation
-  (PH) Novelis Inc.
-  (CA) Coca Cola Beverages N...
-  (CA) JSW Steel
-  (CA) Owens Corning
-  (MS) Narragansett Bay Com...
-  (W) RTX



# Virtual In-Plant Trainings

| Topic   | Dates                         |
|---|-------------------------------|
| Compressed Air Systems                        | 8 sessions (January-March)    |
| Manufacturing Waste Reductions                | 8 sessions (February-April)   |
| Process Heating                               | 8 sessions (April-May)        |
| Cybersecurity                                 | 4 sessions (April-May)        |
| Onsite Energy Generation and Storage          | 6 sessions (June-July)        |
| Utility Bill Analysis                         | 6 sessions (August-September) |
| Renewable Energy Contracting Options and RECs | 6 sessions (August-September) |
| Municipal Drinking Water                      | 8 sessions (October-November) |
| Motors  | 4 sessions (December)         |



<http://bptraining.ornl.gov/>

# Bootcamps 2025

| Bootcamp | Dates                 |
|----------|-----------------------|
| Energy   | Feb 24 to 28, 2025    |
| Energy   | Sep 29 to Oct 3, 2025 |



<https://energybootcamp.ornl.gov>

# Workforce Development: Energy Treasure Hunt



## A 3-day training focused on:

- Low-cost/No-cost actions to reduce energy consumption
- Learning ways to continuously improve
- Cross-functional teams brainstorming
- Teams identify, analyze, and evaluate energy savings opportunities
- Identified opportunities quantified

### Observing the Idle Facility

- Energy Treasure Hunts usually start on Sunday or periods of reduced production

### Employee Engagement

- Cross-functional team of employees conduct the Treasure Hunts and have ownership of the ideas / opportunities

### Expert Facilitation

- Outside experts / participants are there to facilitate the process, generate discussion, and help quantify opportunities

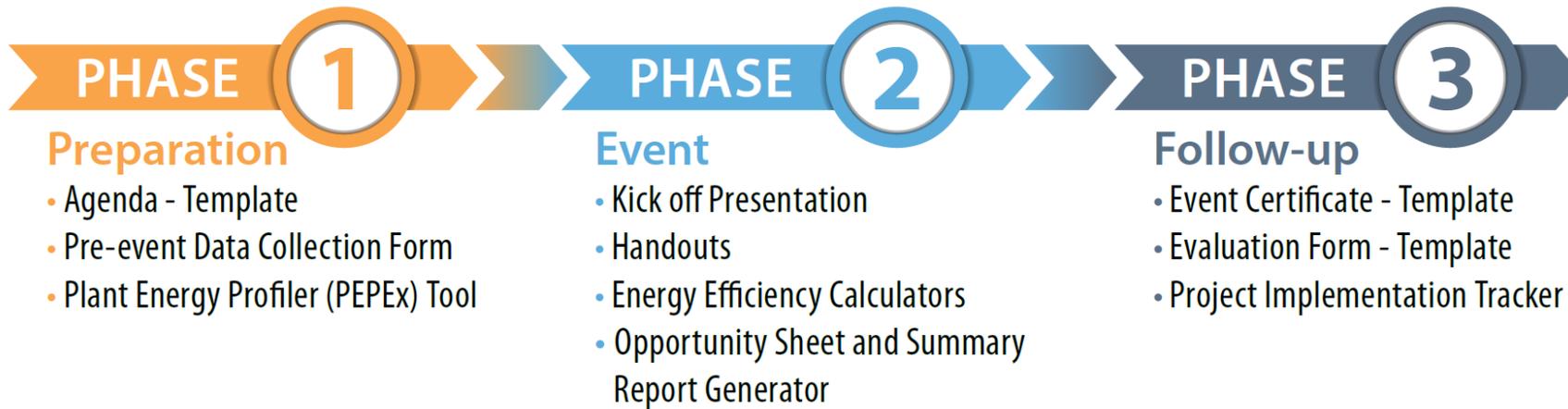
### Leverage Plant Personnel Knowledge

- Plant personnel will have insights into opportunities in their facilities and will take ownership of energy savings measures

**Employees implement the Treasure Hunt process!**

<https://betterbuildingssolutioncenter.energy.gov/better-plants/energy-treasure-hunts>

# Treasure Hunt Toolkit – Anyone can do it!



## Key Aspects:

- Learn to utilize MEASUR software
- Empower and enable plant personnel
- Focus on low-cost/no-cost opportunities
- Observing the idle facility
- Facility employees conduct and have ownership of the ideas / opportunities



# Complementary Programs

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**Industrial  
Assessment  
Center**  
U.S. DEPARTMENT OF ENERGY



**Onsite  
Energy**  
U.S. DEPARTMENT OF ENERGY

 **Better  
Plants<sup>®</sup>**  
U.S. DEPARTMENT OF ENERGY



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



**Manufacturing<sup>SM</sup>  
USA**

# ITO's Energy Intensive Initiative

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A program that supports energy efficiency in energy intensive industrial sectors

## Focus on technical assistance (TA)

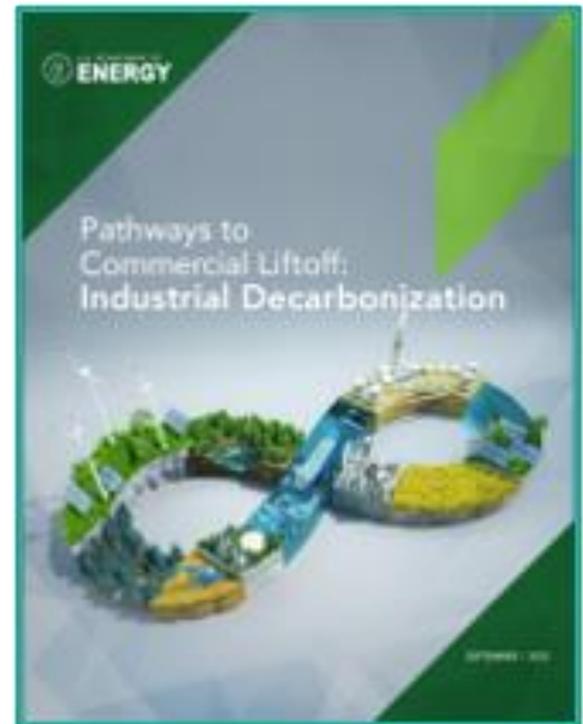
- Assessments on energy, water, waste, carbon
- Training on industrial systems and topic areas
- Scenario planning on emerging technologies and onsite generation
- Impacts of energy efficiency on industrial process

## Leverage & work with other Federal programs & stakeholders

- Energy Star for Industry, NIST
- NASEO

## Connecting with R&D

- DOE National Laboratories
- DOE programs: Cross-Sector Technologies, Strategic Analysis, EII R&D



# Energy Intensive Initiative: What's in it for You?

## Get Free Technical Assistance

- Receive customized, unbiased technical assistance on energy efficiency and decarbonization
- Peer-to-peer networking opportunities through working groups, workshops, conferences and benchmarking activities

### Technical Assistance Resources:

- Energy and optimization assessments
- Customized training on industrial systems/topics
- Technology scenario planning/demonstrations of energy-saving technologies and/or materials



Assessments



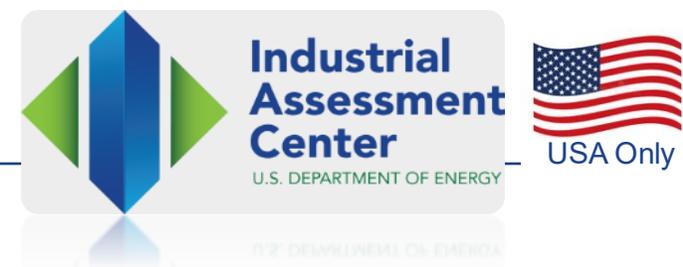
Trainings



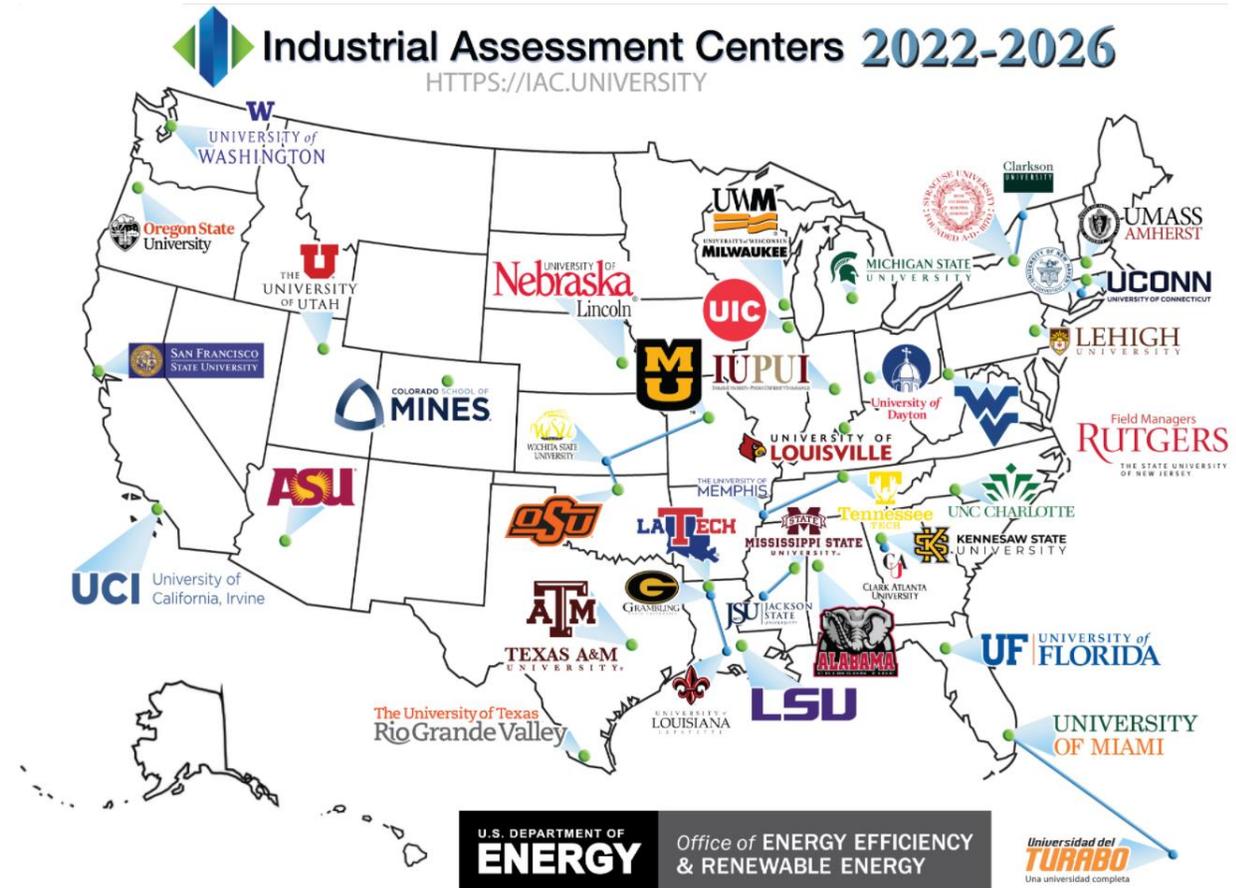
Technology  
Scenario  
Planning

**EII Technical Assistance**

# Industrial Assessment Centers



- **No-Cost Energy Assessments** for Small and Medium Manufacturing and Wastewater Facilities
- Full Assessment and 1 year follow-up
- **Public database** contains over 17,600 assessments with 134,000+ recommendations
- Average IAC Client saves \$47,000
- Average assessment leads to **5-7%** implemented savings



# 50001 Ready: Technical Assistance and Recognition

## 1. Implement ISO 50001 principles

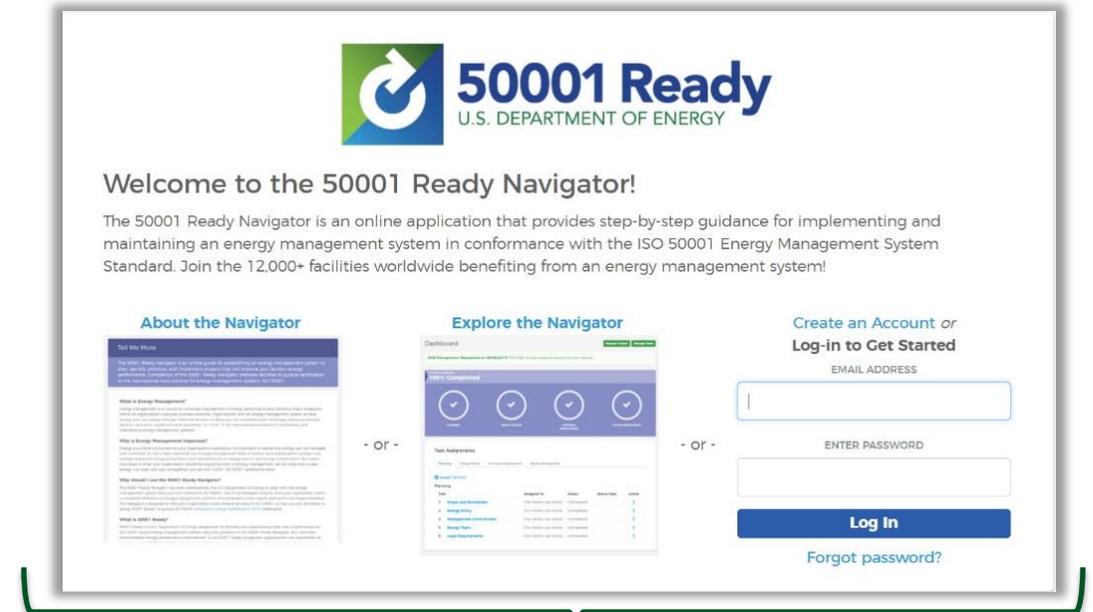
Complete 25 tasks in DOE's free, self-guided, online tool -- 50001 Ready Navigator.

## 2. Present energy performance

Submit energy performance data. May use EPA's Portfolio Manager or DOE's EnPI Lite.

## 3. Self-attest to 50001 Ready

Obtain management sign-off on 50001 Ready implementation and commitment.



DOE recognizes  
50001 Ready achievement



ISO 50001  
Certification

# Do Not Reinvent the Wheel!



## SAINT-GOBAIN: Smart Energy Management System

Saint-Gobain installed more than 180 energy meters integrated with a smart energy management system (EMS) at its gypsum wallboard plant. Within three months, the EMS helped identify several opportunities to reduce energy usage and enabled the plant team to scope process changes and projects to address them.

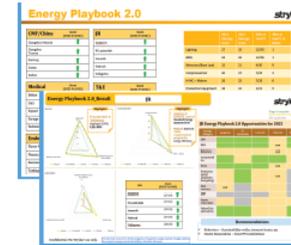
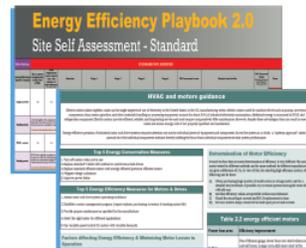
- ✔ Developed a customized EMS solution that contextualizes energy used per product SKU number and monitors energy consumption during plant downtimes and during the start-up and shut down periods
- ✔ Enables the plant team to set targets and highlight the lowest energy use production runs using a 24-hour live energy performance indicator dashboard
- ✔ Includes an alert system to notify users of substantial energy increases



## STRYKER: Corporate Energy Playbook 2.0

Stryker updated and rolled out an Energy Playbook to drive a pipeline of future energy and emissions-reduction projects, resulting in more than 45 Stryker sites participating in the Energy Playbook self-assessment process and over 60 projects implemented in 2022.

- ✔ Defines Stryker's energy standards and provides guidance on 10 priority categories
- ✔ Accompanies a financing structure for projects with less than a 7-year payback to accelerate implementation
- ✔ Includes replicable case studies of successful projects by Stryker sites along with guidance, graphics and rules of thumb for specific energy systems



## EASTMAN CHEMICAL COMPANY: Integrating Energy Management with Broader Sustainability Goals

Eastman developed an organizational structure for its sustainability program that integrates the energy management and sustainability teams, which has resulted in a more than 12% improvement in energy intensity since baseline year with over 70 active energy efficiency projects valued at over \$20 million.

- ✔ Leveraged Eastman's energy management experience and elevates the importance of energy efficiency as a subgoal for process improvement projects
- ✔ Set up working groups focused on carbon and climate, energy efficiency, water stewardship, and waste management
- ✔ Developed metrics with projected greenhouse gas emissions savings that are tracked across the energy management and sustainability teams



# Why Partner with Better Plants?

## Consider Partnering If:

- 1) Energy is a significant part of operating costs
- 2) Want/need technical assistance with resource efficiency and decarbonization
- 3) Networking with industry-sector peers & independent experts is helpful
- 4) Recognition for energy efficiency/sustainability accomplishments is desired



# Better Buildings Solution Center

More than 3,000 solutions are available publicly in the Better Buildings Solution Center

## Showcase Projects:

- Successful Energy Savings Case Studies

## Implementation Models (Playbooks):

- Overcome barriers: finance, data, energy management, staff training, partnering with utilities, and more
- Multi-faceted and applicable across sectors

## Technology Focus Area Pages

- 13 focus areas, from compressed air to renewables
- DOE tipsheets and publications, software tools, webinars, and contact information for a subject matter expert

## Additional Resources, Toolkits, Case Studies



[energy.gov/bbsc](https://energy.gov/bbsc)



# Thank you!

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