



DOE Resources to Improve Resource Efficiency, and Competitiveness

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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

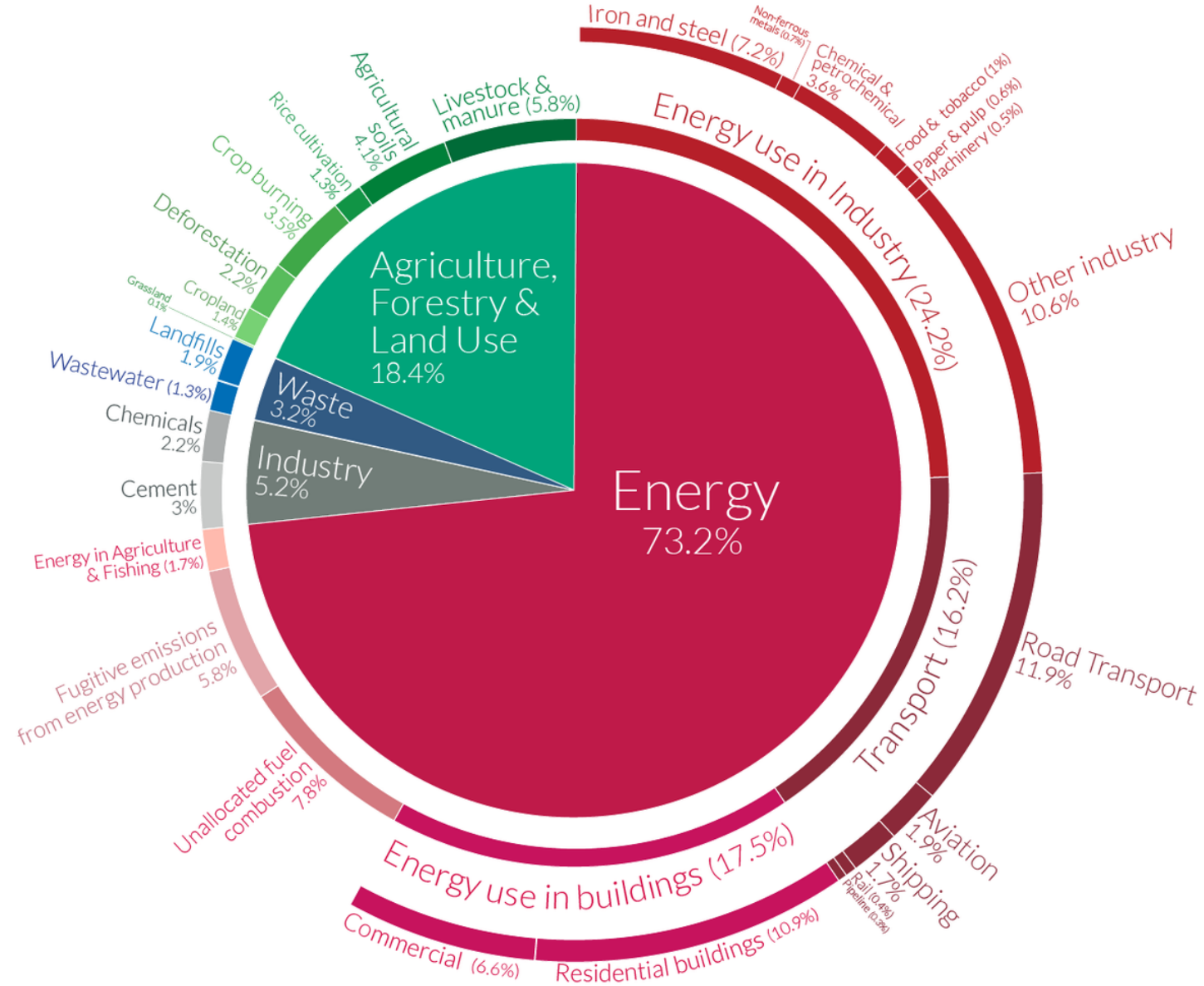
How are you going to get there?

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 CO₂eq.

Our World
in Data



What are the DOE Programs?

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

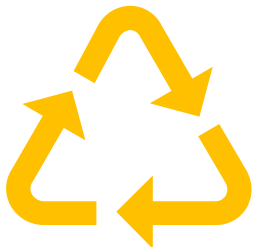
Through BBBP, partners voluntarily set a specific goal, typically to **reduce energy intensity** by 25% and/or GHG emissions by 50% over a 10-year period across all their U.S. operations.



**Increased Energy
Productivity**



**Water
Savings**



**Waste
Reduction**



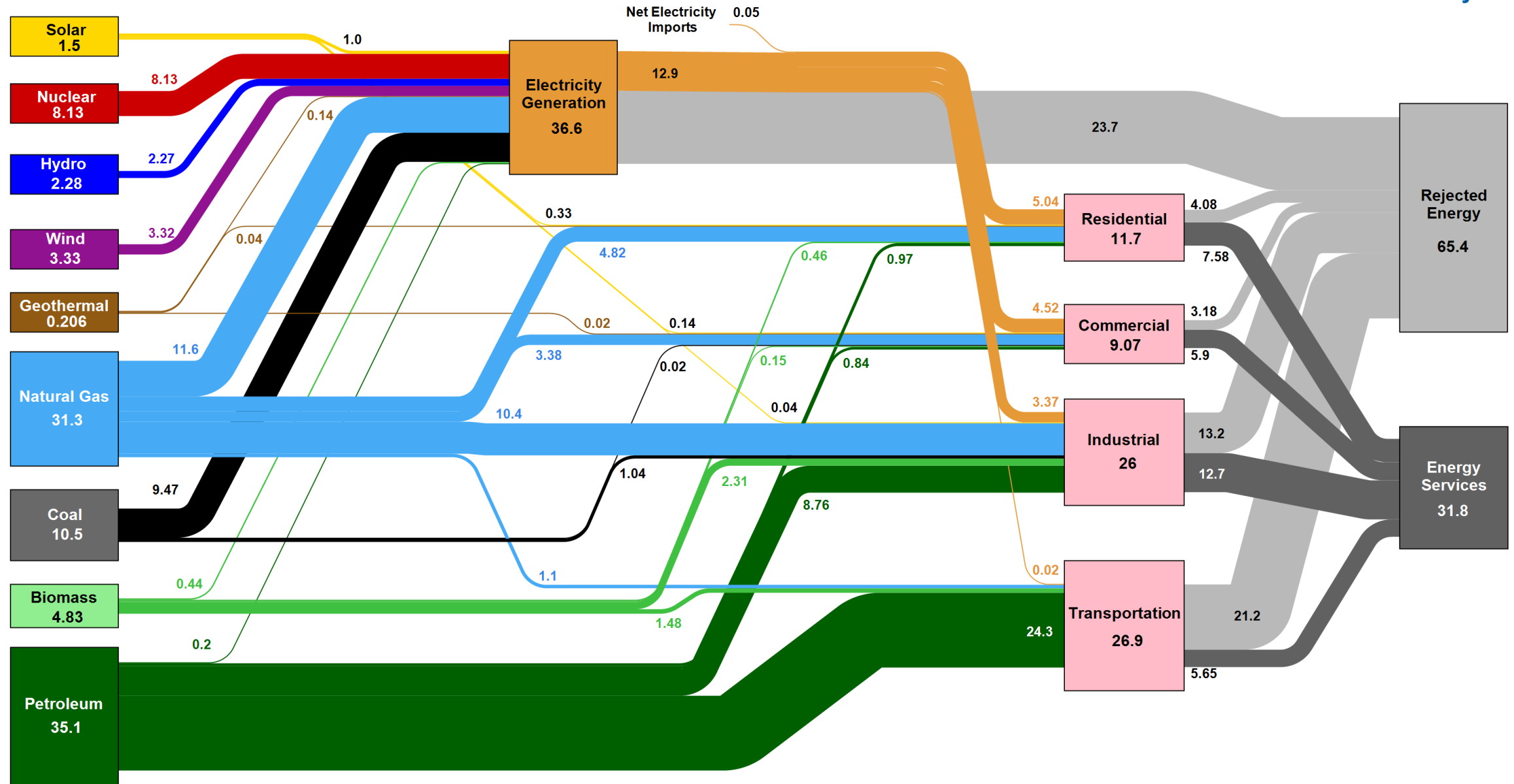
**Decarbonization
(Better Climate Challenge)**

Why Focus on Industrial Energy Efficiency?



- 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

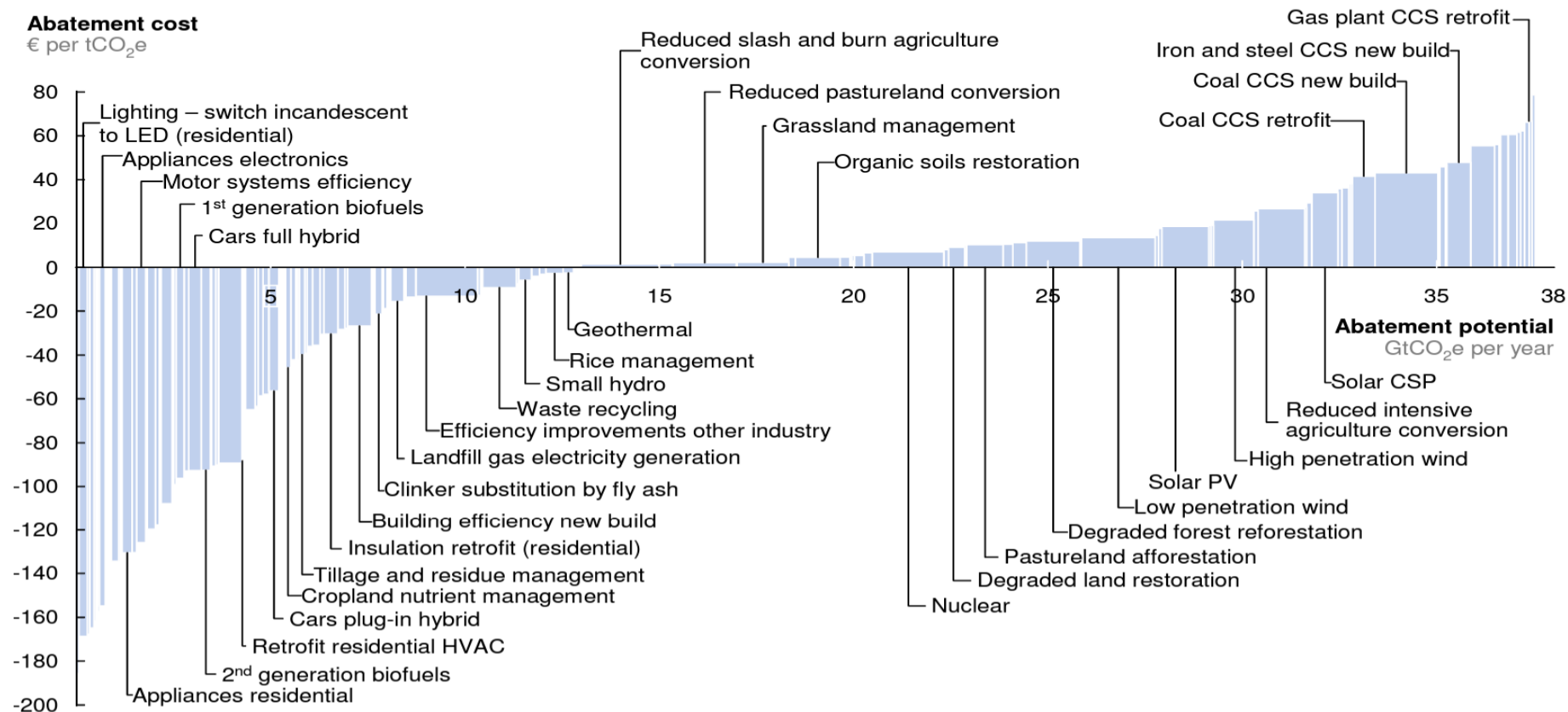
Estimated U.S. Energy Consumption in 2021: 97.3 Quads



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 tCO₂e 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.



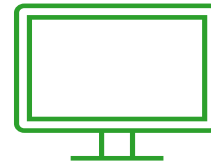
**60+
Calculators**



**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



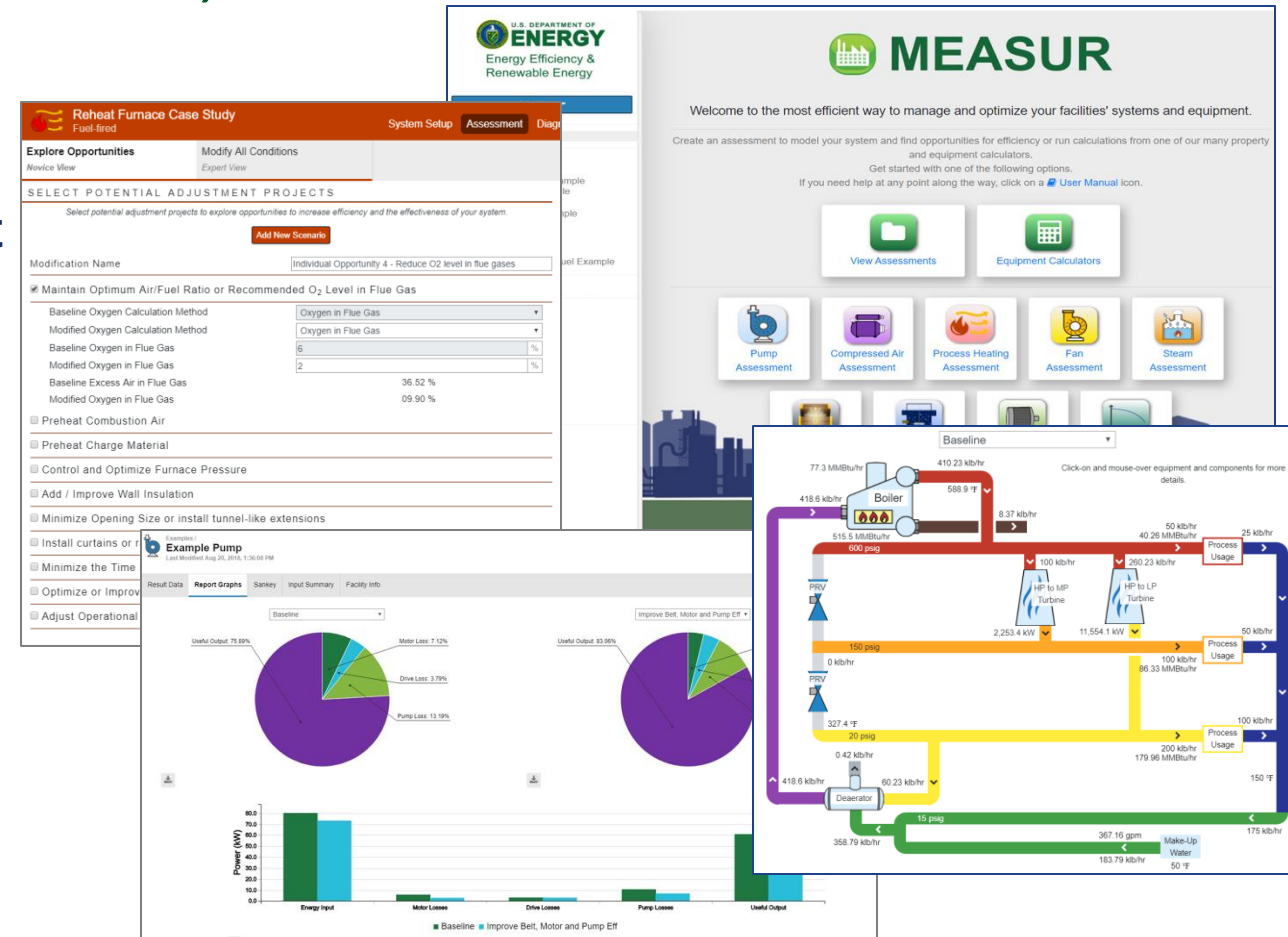
Plant Water Profiler
Plant Carbon Footprint &
Decarbonization Assessment Tool
Carbon Emissions Calculator
Waste Stream Energy Content

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



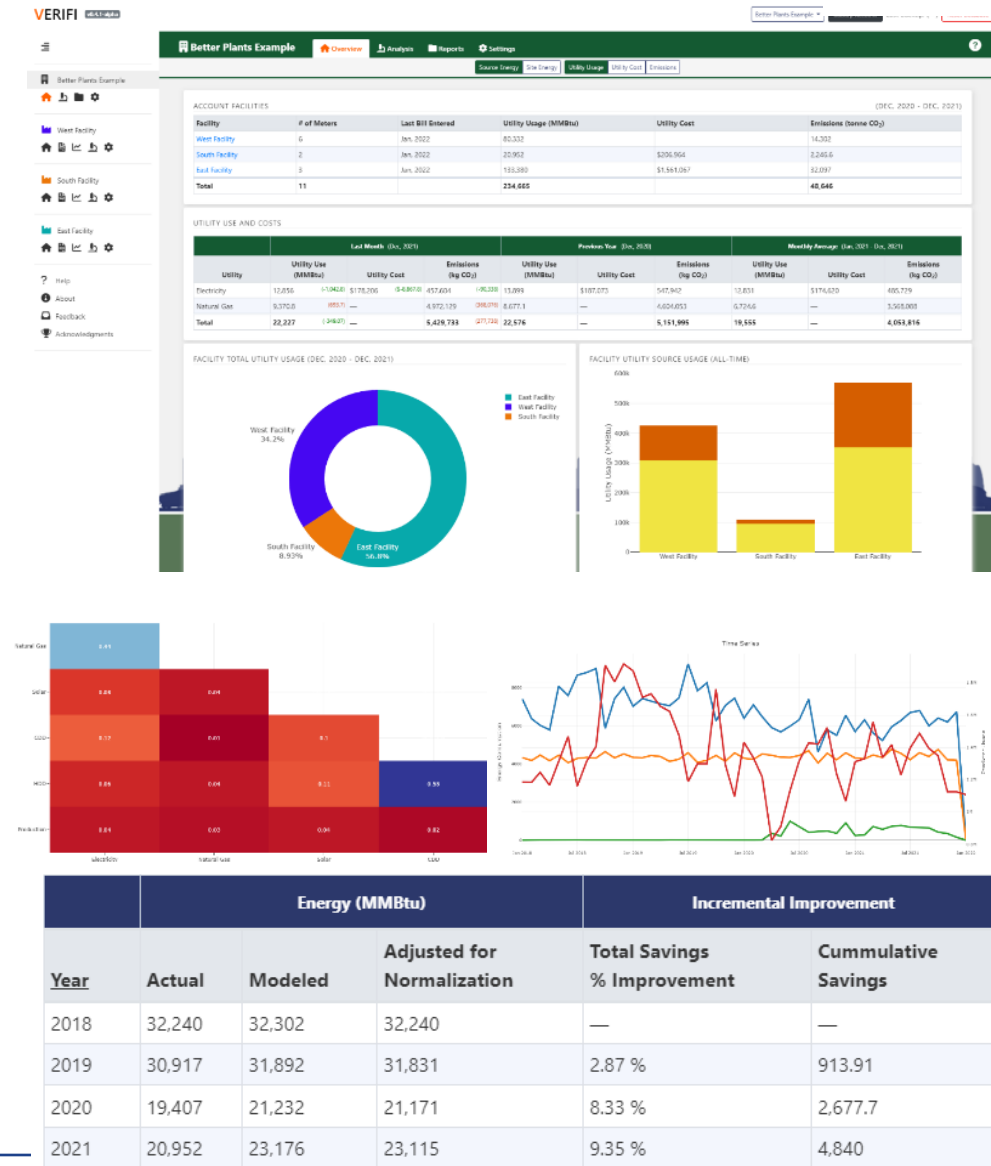
<https://www.energy.gov/eere/amo/measur>

(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



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

The image displays three screenshots of the 50001 Ready Navigator web application. The top screenshot is the welcome page, featuring the U.S. Department of Energy logo and a 'Welcome to the 50001 Ready Navigator!' message. It includes a brief description of the application and links to 'Tell Me More', 'Explore the Navigator', and 'Create an account or Log-in to Get Started'. The middle screenshot shows the 'Dashboard' with a '40% Completed' progress bar and four circular progress indicators for Planning (60%), Energy Review (25%), Continual Improvement (0%), and System Management (71%). Below the dashboard is a 'Task Assignments' table. The bottom screenshot shows the 'Continual Improvement' section, specifically 'Task 17: We investigate and respond to significant deviations in energy performance and potential issues with the 50001 Ready system, taking corrective and preventative actions as needed'. It includes a 'Detailed Guidance: Corrective Actions' section with a list of criteria for identifying significant deviations.

50001 Ready
U.S. DEPARTMENT OF ENERGY

Welcome to the 50001 Ready Navigator!

The 50001 Ready Navigator is an online application that provides step-by-step guidance for implementing and maintaining an energy management system in conformance with the ISO 50001 Energy Management System Standard. Join the 12,000+ facilities worldwide benefitting from an energy management system!

Tell Me More **Explore the Navigator** **Create an account or Log-in to Get Started**

EMAIL ADDRESS

Dashboard **Planning** **Energy Review** **Continual Improvement** **System Management**

Dashboard

OVERALL PROGRESS
40% Completed

60% PLANNING 25% ENERGY REVIEW 0% CONTINUAL IMPROVEMENT 71% SYSTEM MANAGEMENT

Task Assignments

Task	Assigned To	Status	Status Date
1 Scope and Boundaries	Paul Sheaffer	Completed	03/14/2017
2 Energy Policy	Paul Sheaffer	Completed	03/14/2017
3 Management Commitment	Paul Sheaffer	Completed	03/14/2017
4 Energy Team	Paul Sheaffer	Not Started	
5 Legal Requirements	Paul Sheaffer	Not Started	

Continual Improvement

Tasks: Corrective Actions

Task 17: We investigate and respond to significant deviations in energy performance and potential issues with the 50001 Ready system, taking corrective and preventative actions as needed

Current Status: Not Started

Detailed Guidance: Corrective Actions

Full Description

Set and implement criteria for significant deviations

A deviation may be identified by a specific level of variation or can be evaluated by knowledgeable personnel to determine if it is significant and if action is required. Examples of methods for specifying significant deviations can include the following:

- Values outside of control limits
- Decent variation in value
- Trends identified
- Specified variation in ENRs
- Specified variation in SEU performance
- Level of variance between expected and actual performance
- Change in equipment efficiency
- Variation in specific relevant variable performance
- Failure to meet objectives and targets
- Failure to meet a specific performance level

Once you determine the method(s) for identifying a significant deviation, you must determine the criteria you will use to evaluate if a significant deviation occurs. Your organization determines the method and criteria in accordance with what you deem acceptable or unacceptable relative to the impact on energy performance. A significant deviation can

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!


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.

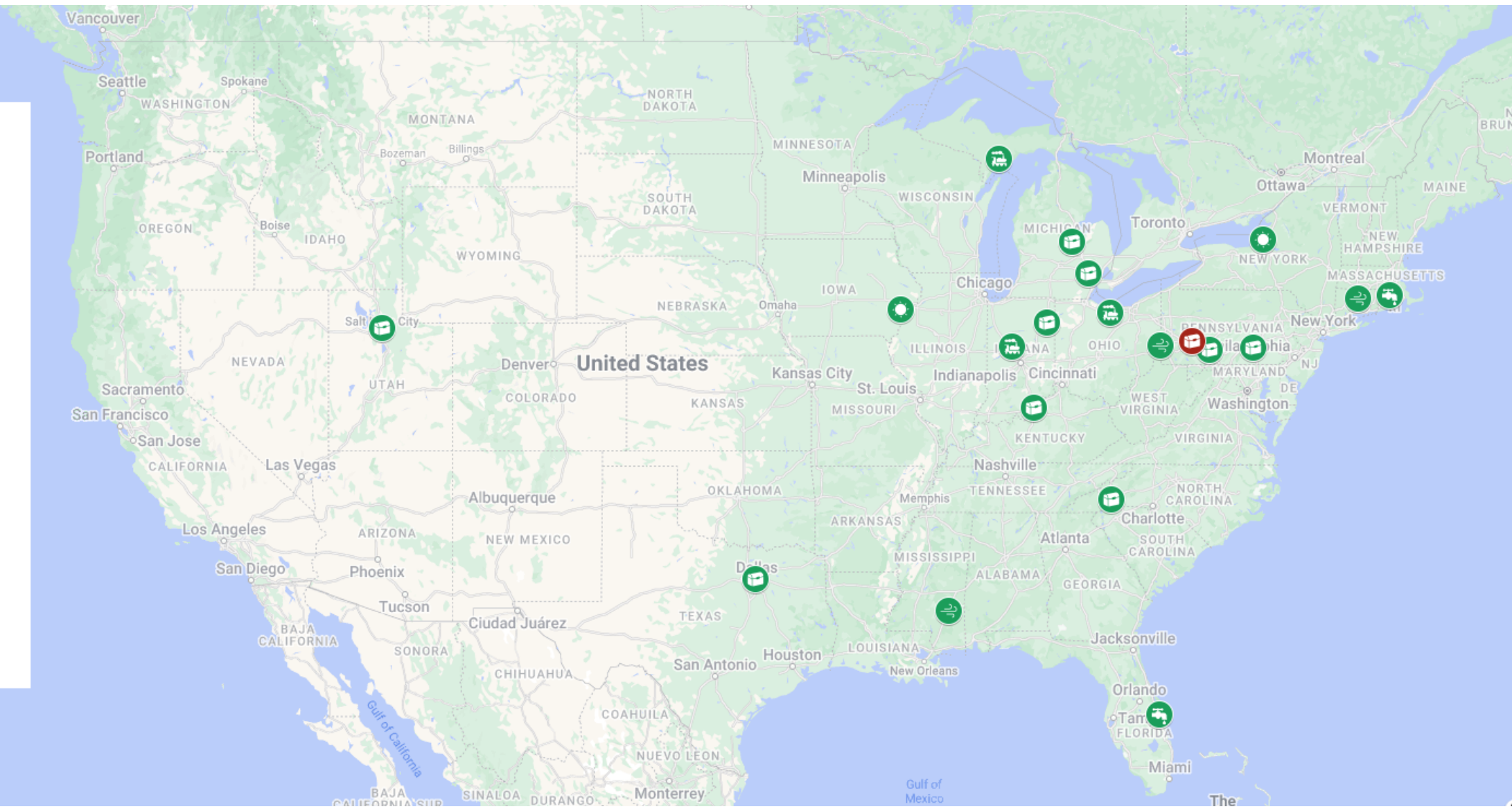
 (CA) Coca Cola Beverages N...

 (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)



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

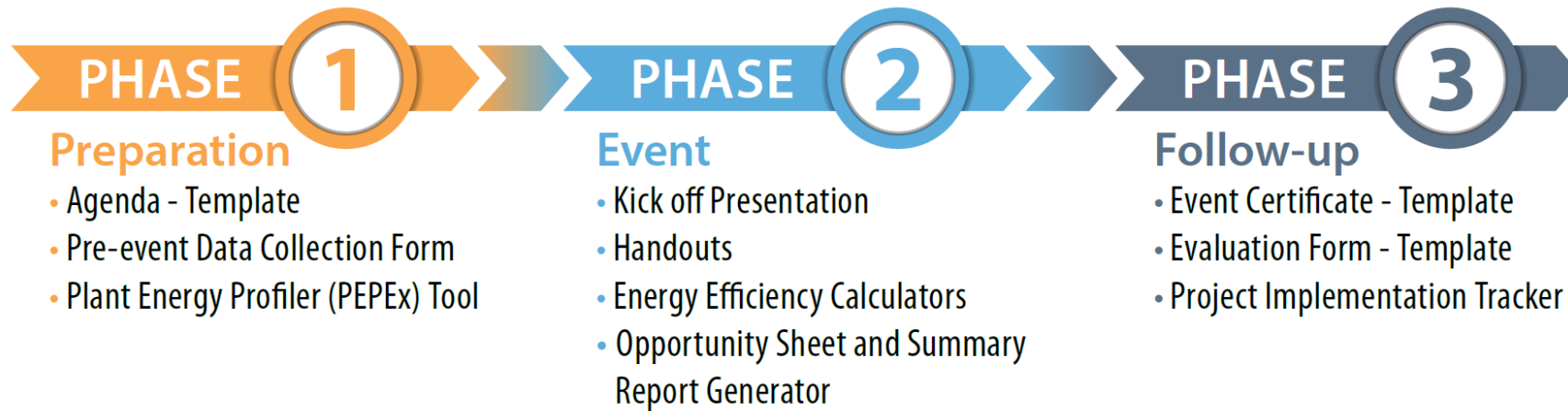
Leverage Plant Personnel Knowledge

- 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



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



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



**Better
Plants®**
U.S. DEPARTMENT OF ENERGY



50001 Ready
U.S. DEPARTMENT OF ENERGY



**ManufacturingSM
USA**

ITO's Energy Intensive Initiative

A program that supports energy efficiency in energy intensive industrial sectors

Focus on technical assistance (TA)

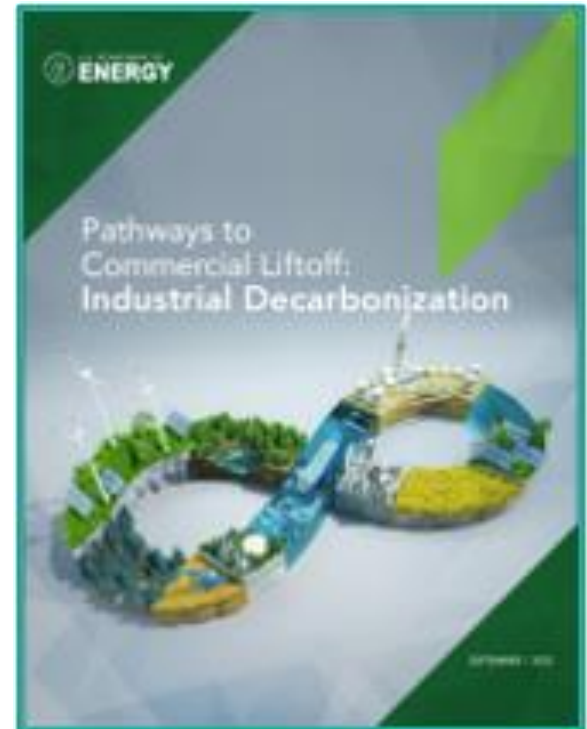
- Assessments on energy, water, waste, carbon
- Training on industrial systems and topic areas
- Scenario planning on emerging technologies and onsite generation
- Impacts of energy efficiency on industrial process

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



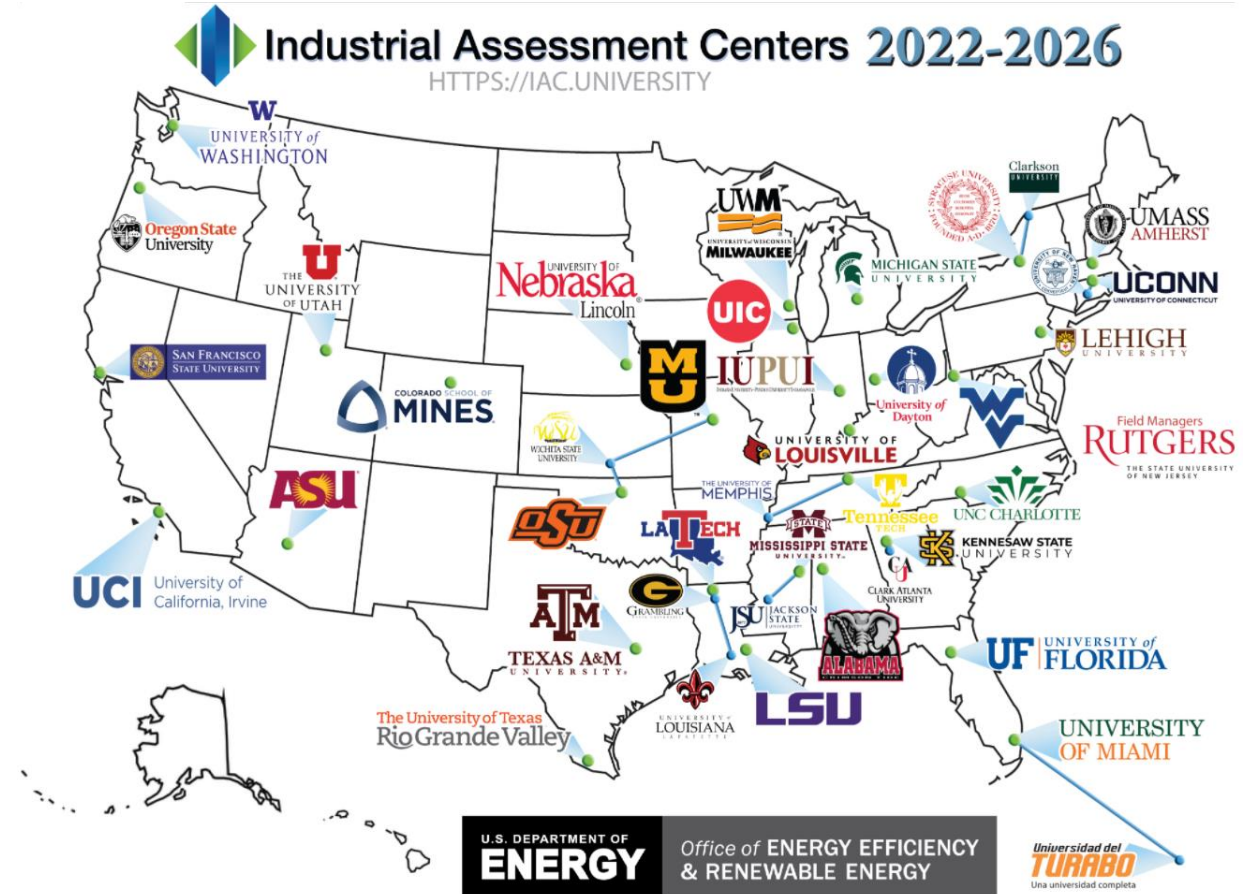
Technology
Scenario
Planning

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

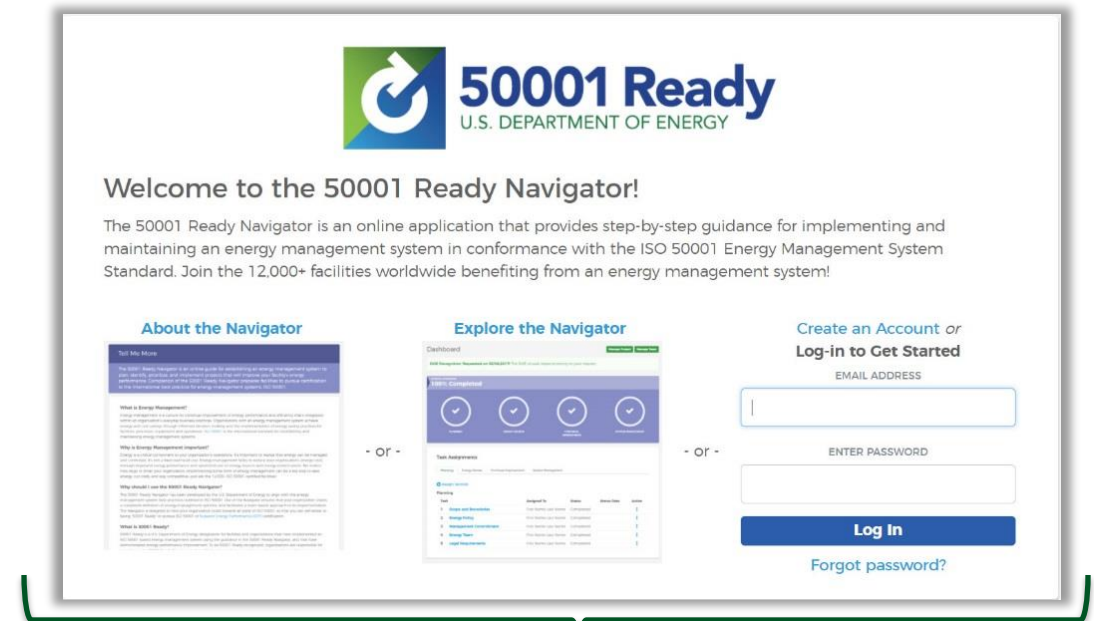
Complete 25 tasks in DOE's free, self-guided, online tool -- 50001 Ready Navigator.

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.

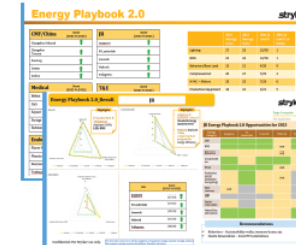
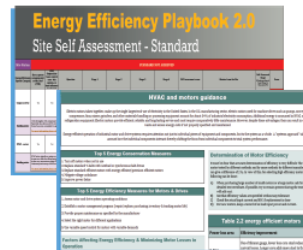
- ✓ Developed a customized EMS solution that contextualizes energy used per product SKU number and monitors energy consumption during plant downtimes and during the start-up and shut down periods
- ✓ Enables the plant team to set targets and highlight the lowest energy use production runs using a 24-hour 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

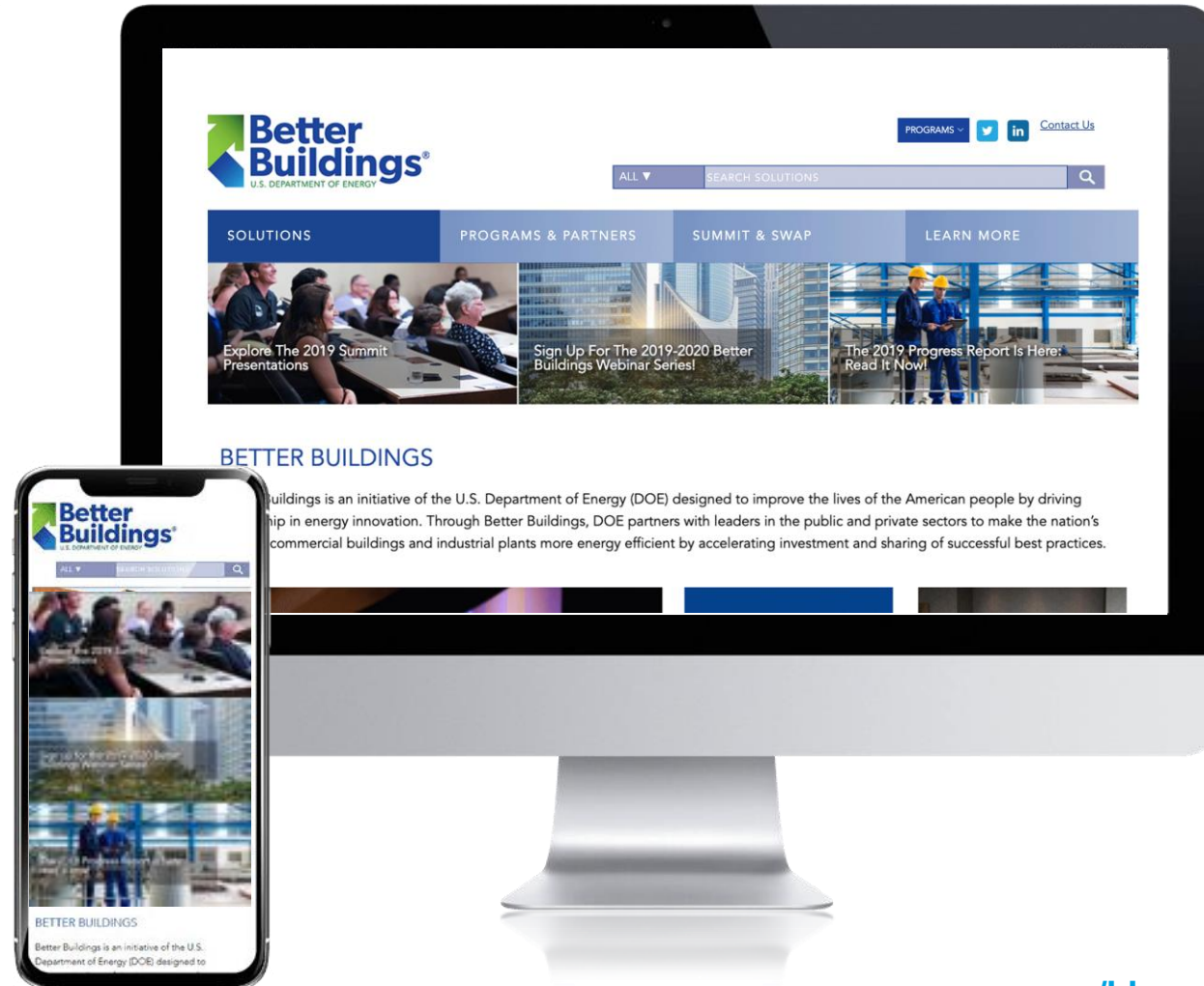
Implementation Models (Playbooks):

- 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



Thank you!

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