

U.S. DEPARTMENT OF
ENERGY

Office of
ENERGY EFFICIENCY &
RENEWABLE ENERGY

Technical Assistance for Energy Intensive Manufacturers

Industrial Energy & Decarbonization Office (IEDO)

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Who we are: Industrial Efficiency and Decarbonization Office (IEDO)

IEDO works to increase energy efficiency in manufacturing to drive energy productivity, economic growth, and decarbonization

MANUFACTURING

Uses roughly 25% of the nation's primary energy



Accounts for one quarter of the U.S.'s greenhouse gas emissions



Represents nearly 80% of energy use in energy-intensive sectors



Generates 11% of the U.S. GDP and 12 million jobs



Incurs \$150 billion in energy costs annually



IEDO GOALS

- Improve the **productivity, competitiveness, energy efficiency, and security** of U.S. manufacturing
- Reduce the **life cycle energy and resource impacts** of manufactured goods
- Leverage diverse **domestic energy resources and materials** in U.S. manufacturing, while strengthening environmental stewardship
- Transition **DOE-supported innovative technologies and practices** into U.S. manufacturing capabilities
- Strengthen the **U.S. manufacturing workforce**
- Accelerate emerging and transformative technologies needed to **approach net-zero greenhouse gas emissions** in the industrial sector by 2050

IEDO Technical Assistance & Workforce Development (TAWD)

Direct engagement with industry to drive the widespread adoption of proven technologies and practices to improve energy performance and reduce GHG emissions



Support the deployment of energy efficiency and decarbonization technologies and practices



Foster feedback from stakeholders on critical technology challenges that may be addressed through RD&D

IEDO offers no-cost tools/programs to improve energy efficiency, competitiveness, & sustainability:



- Expert technical assistance and training on energy efficiency
- Access to Innovation & instruments
- National recognition for achievements



- Energy efficiency + decarbonization technical assistance & training
- Facilitated peer-to-peer knowledge sharing
- National recognition for achievements



- Tools, guidance and recognition for facilities that implement an ISO 50001-based energy management system
- No-cost, self-paced, audit-free



- Advanced technical assistance for CHP, microgrids, and district energy
- No-cost resources and training webinars
- Packaged CHP system eCatalog

NO-COST TOOLS & SOFTWARE

 MEASUR Software Suite

 50001 Ready Navigator Tool

 REopt Web Tool

 Financing Navigator

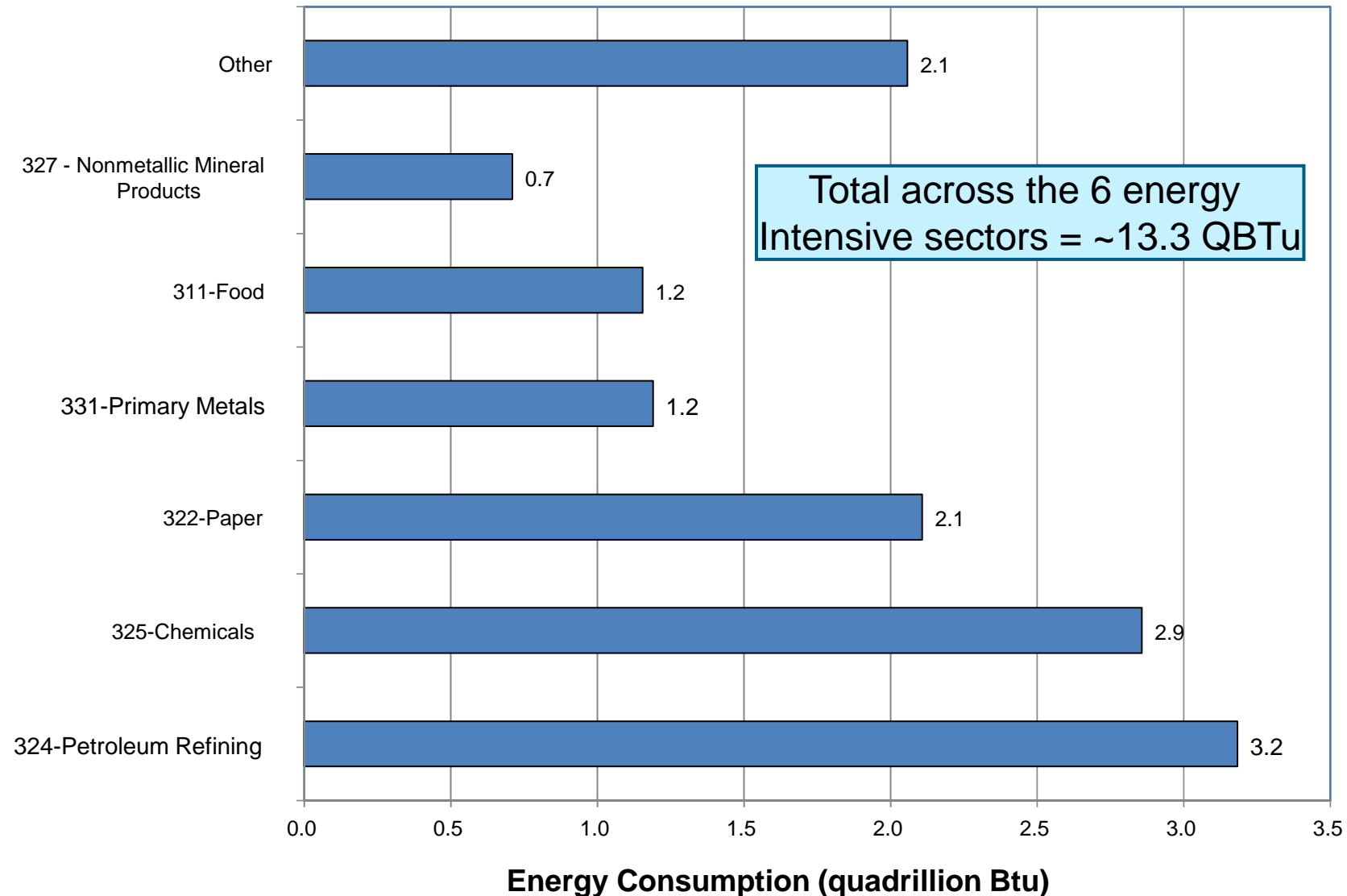
 Low Carbon Action Plan Tool

 Carbon Inventory Calculator

 Electrification Impact Calculator

Why Focus on Energy Intensive Sectors?

- 6 NAICS codes account for 69% of manufacturing energy use
- Energy intensive manufacturers offer great potential to improve energy and environmental performance



Goals of the Energy Intensive TA Pilot

Understand the TA needs of energy intensive sectors and determine a programmatic structure that addresses those needs.

Increase IEDO Engagement with Energy Intensive Sectors:

- Engage energy intensive manufacturers and assess energy efficiency/decarbonization potential
- Generate feedback loop between R&D and TAWD efforts for energy intensive manufacturers
- Develop a program structure that addresses the unique needs of energy intensive manufacturers

Work with other DOE and Federal agencies to optimize efforts

Background & Strategic Approach

Two Parallel Pathways:

Collaboration
with EPA ENERGY
STAR for Industry

- Focus on chemicals sector
- Creation of new energy performance indicators (EPIs)

Customized TA to
Manufacturers

- Engage with non-partner EIs to learn about their needs
- Trial a range of tools/resources

TA program
targeted at
Energy
Intensive
Industries

EPA Collaboration:

- Develop EPI for chlor-alkali
- Identify other resources that can be developed jointly

Energy Intensive Pilot: What's in it for You?

Get Free Technical Assistance

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



Assessments



Trainings



Technology
Scenario Planning

EII Pilot Technical Assistance

Customized TA through ORNL

1. Engage with EIs to learn about their needs
2. Trial a range of tools, solutions, and resources over a two-year period to determine what will offer the most value

A. Energy Assessments, Training & Education

- Perform energy/decarbonization assessments and trainings
- Perform technology demonstrations of energy-saving technologies and/or materials
- Identify methods to generate clean, alternate fuels and carbon capture & usage

B. Potential Resources

- Develop tools, solutions and resources
- Generate new trainings and knowledge-sharing platforms
- Generate case studies, white papers, webinars, social media content to communicate success and lessons learned

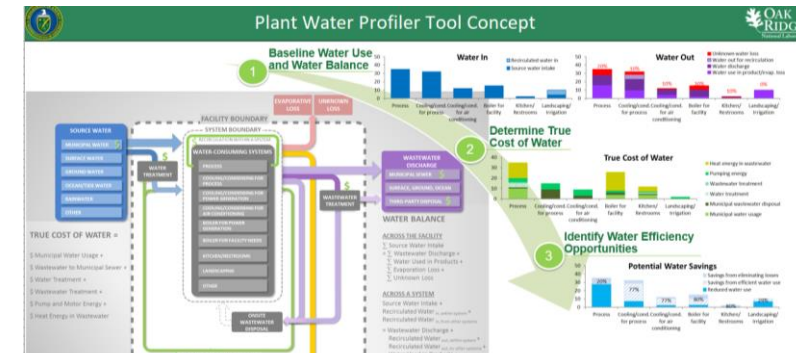
Assessments by Subject Matter Experts

- Assessments performed by Subject Matter Experts (SMEs) with 30+ years experience in industrial energy management
- Industrial system assessments
 - Compressed air, process heating, steam, pumps, fans, and process cooling
- Decarbonization assessments
 - Alternate technology and fuels, thermal process intensification
- Process- specific assessments
 - Energy efficiency and/or decarbonization as focus
- Onsite Generation/CHP assistance (turbines, fuel cells, microgrids, TES etc.)
 - Onsite generation screening and feasibility analysis, engineering support, multiple fuels and technology options



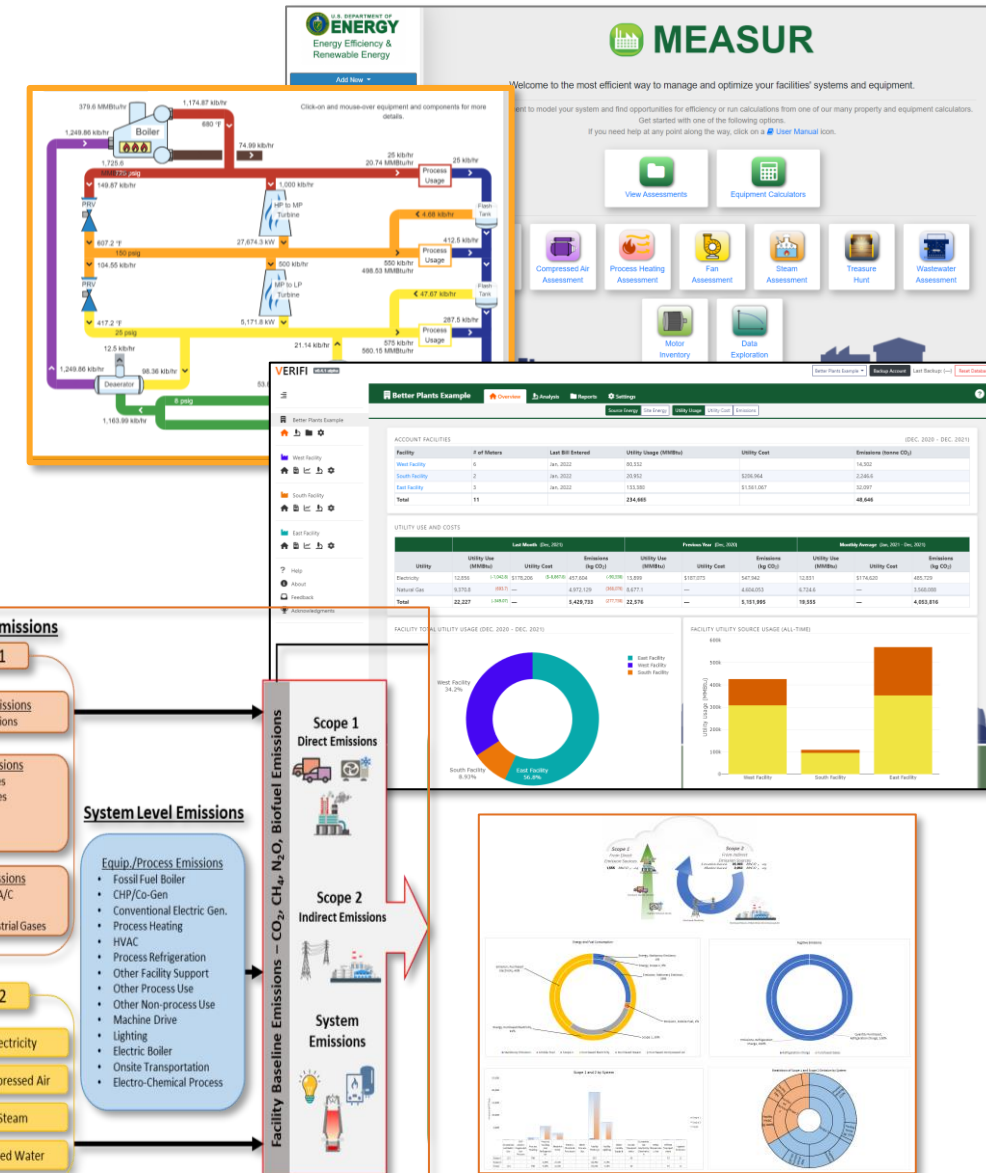
Assessments by Subject Matter Experts

- Water efficiency improvement assessments
 - Water-energy nexus assessments
 - Water management best practices
- Waste reduction assessments
 - Waste reduction best practices
 - Waste to energy opportunities
- Plant-wide assessments
 - Multi-system assessment
 - Small and medium sized facilities
 - Information on implementation grants



Software Tools

- Industrial System Optimization Tools
 - Profile industrial energy systems for energy savings
- Utility Dashboard Platform
 - Corporate and facility level utility bill analysis
 - Track energy and carbon reduction
- Water Efficiency Improvement
 - Facility level water assessment
 - True cost of water
- Decarbonization Tools
 - Determine facility carbon footprint
 - Decarbonization roadmap
- ~80 calculators embedded



Trainings

- Patterned on In-Plant Trainings (INPLTs)
 - Learn how to assess systems from SMEs
 - How to use DOE diagnostic & software tools
 - How to implement operator-level projects



In-Plant Training Topics:

- Pumping Systems
- Fans
- Compressed Air
- Motors
- Processed Heat
- Steam Systems
- Industrial Refrigeration
- Water/Wastewater Treatment
- Water Efficiency
- Energy Treasure Hunt
- 50001 Ready

Energy Treasure Hunts



- A 2 or 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 Local Personnel Knowledge

- Local personnel will have the most expertise on optimizing facility production and operational changes

Technology Scenario Planning/Demonstration



- Technology demonstrations at National labs across the nation
 - Tour state of the art facilities on CHP, Renewable Energy, Computational Methods
 - First-hand demonstrations of innovative technologies, e.g., 3-D printing
 - Leverage research and technologies through lab-industry partnerships
- Teaming support for RD&D efforts
- LCA Assistance

Energy Intensive Pilot: Outreach Approach

Before Technical Assistance

- Submit online **Request for Technical Assistance**
- Participate in **30-minute interview** on energy and decarbonization priorities and goals

Receive Technical Assistance

After Technical Assistance

- **Provide feedback** on technical assistance offerings
- Consider participating in **future opportunities**, including peer-based trainings, scenario planning, and technology demonstrations

Fill out the survey and let us know how we can help!



<https://www.surveymonkey.com/r/JNGFFFS>

Energy Intensive Pilot: How can You get Started?

Program Contacts



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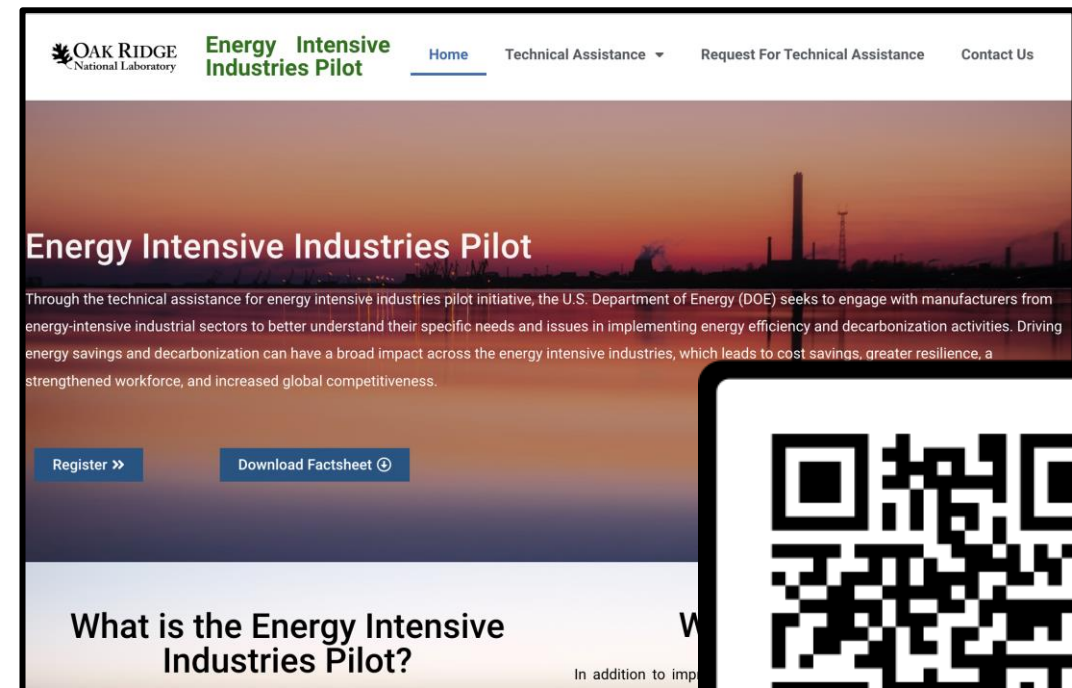
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Submit a Request for Technical Assistance:

<https://eiipilot.ornl.gov/>



APRIL
2-4
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Better Buildings, Better Plants
SUMMIT

LEARN MORE: betterbuildingsolutioncenter.energy.gov/summit

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Thank you!

