U.S. DEPARTMENT OF ENERGY

Office of ENERGY EFFICIENCY & RENEWABLE ENERGY

INDUSTRIAL EFFICIENCY & DECARBONIZATION OFFICE

Federal Resources and Programs to Support Asphalt and Pavement Producers

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Oak Ridge National Laboratory

April 2025

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

IEDO invests in RD&D and technical assistance & workforce development to **increase competitiveness of the U.S. industrial base in global markets.**

MANUFACTURING

- Uses roughly 25% of the nation's primary energy
- Generates 11% of the U.S. GDP and 12 million jobs
- Represents nearly 80% of energy use in energy-intensive sectors
- 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**

Industrial Efficiency and Decarbonization Office

VISION FOR THE FUTURE

Investing in innovation to ensure a competitive and efficient industrial sector that grows alongside the health, wealth, and prosperity of Americans.

MISSION

IEDO accelerates the innovation and adoption of cost-effective technologies that position American industry to lead on the competitive stage in evolving global markets.

BUDGET

$287M

FY25

MAJOR PROGRAM PILLARS

ENERGY-INTENSIVE INDUSTRIES

CROSS-SECTOR TECHNOLOGIES

TECHNICAL ASSISTANCE AND WORKFORCE DEVELOPMENT

IEDO RD&D Programs

Energy-Intensive Industries (EII)

IRON & STEEL
1,469 TBtu
100 MMT CO_2e

CHEMICALS
(including production of low-carbon fuels)
4,842 Tbtu
332 MMT CO_2e

FOOD & BEVERAGE
1,935 TBtu
96 MMT CO_2e

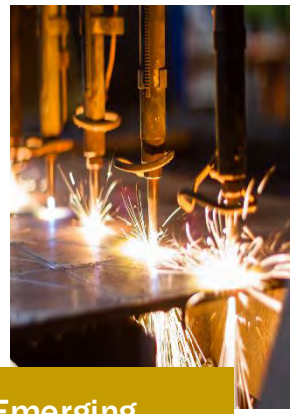
FOREST PRODUCTS
2,883 TBtu
80 MMT CO_2e

CEMENT & CONCRETE
367 TBtu
66 MMT CO_2e

Cross-Sector Technologies

Thermal Processes & Systems

Low-Carbon Fuels, Feedstocks, & Energy Sources



Emerging Efficiency

Water & Wastewater Treatment

IEDO Technical Assistance Programs & Resources

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

Better Plants® U.S. DEPARTMENT OF ENERGY

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

Better Climate CHALLENGE U.S. DEPARTMENT OF ENERGY

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

50001 Ready U.S. DEPARTMENT OF ENERGY

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

Onsite Energy U.S. DEPARTMENT OF ENERGY

- Regional network of Onsite Energy Tech Assistance Partnerships (TAPs)
- Site screenings for multi-technology solutions and advanced analysis
- Market analysis, outreach, and stakeholder engagement

NO-COST TOOLS & SOFT-WARE

- MEASUR Software Suite
- 50001 Ready Navigator Tool
- REopt Web Tool
- Financing Navigator
- Low Carbon Action Plan Tool
- Carbon Inventory Calculator
- Electrification Impact Calculator

50001 Ready and SEP 50001 Programs

The self-paced **50001 Ready program** allows organizations to build a culture of structured energy improvement that does not require any external audits or certifications.

Facilities or organizations that achieve sustained excellence may get certified to the **Superior Energy Performance 50001™** program and receive achieve elevated levels of DOE recognition.

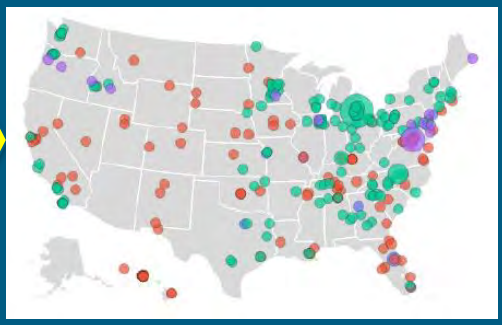
6,000+

are using DOE's 50001 Ready Navigator online tool.

https://navigator.lbl.gov/

50001 READY COHORTS receive 6 to 12 months of support from national ISO 50001 experts, delivered through monthly webinars, virtual one-on-one coaching sessions with each site, and peer-to-peer learning.

Office	Target	Number of Sites Engaged in Program			Participants
		Training Only	Implementation Track	Total	Total
BTO	80-120 Sites	0	12	12	19
FEMP	15-20 Sites	94	52	146	201
IEDO	50-72 Sites	7	149	152	292
SCEP	10-15 Sites	10	16	26	77
Total	**145-212 Sites**	**111**	**229**	**336**	**589**



Better Plants & Better Climate Challenge

A leadership initiative for manufacturers and industrial organizations to set and achieve long-term energy, water, waste, and carbon reduction goals.

Resources for Better Plants partners include:

- Customized technical assistance
- Trainings
- Facilitated peer-to-peer knowledge sharing/networking
- Access to Innovation and Technology validation
- National Recognition

300+ partners

14% of industrial energy footprint

88 Energy goals achieved

12 GHG goals achieved

>$13B

>2.4+ Quads

Better Climate CHALLENGE
U.S. DEPARTMENT OF ENERGY
Better Plants®
U.S. DEPARTMENT OF ENERGY

Energy Intensive Industries Initiative

IEDO's Energy Intensive Industries (EII) initiative is established to support energy-intensive manufacturers in improving energy performance.

Rationale:

- Energy intensive sectors offer significant potential to save energy
- Energy intensive manufacturers are well-positioned to drive technology innovation

Goals:

- Support EIIs to save energy and reduce costs by facilitating collaboration with DOE
- Support EIIs with a wide range of tools, solutions and resources
- Establish feedback loop to inform DOE R&D priorities

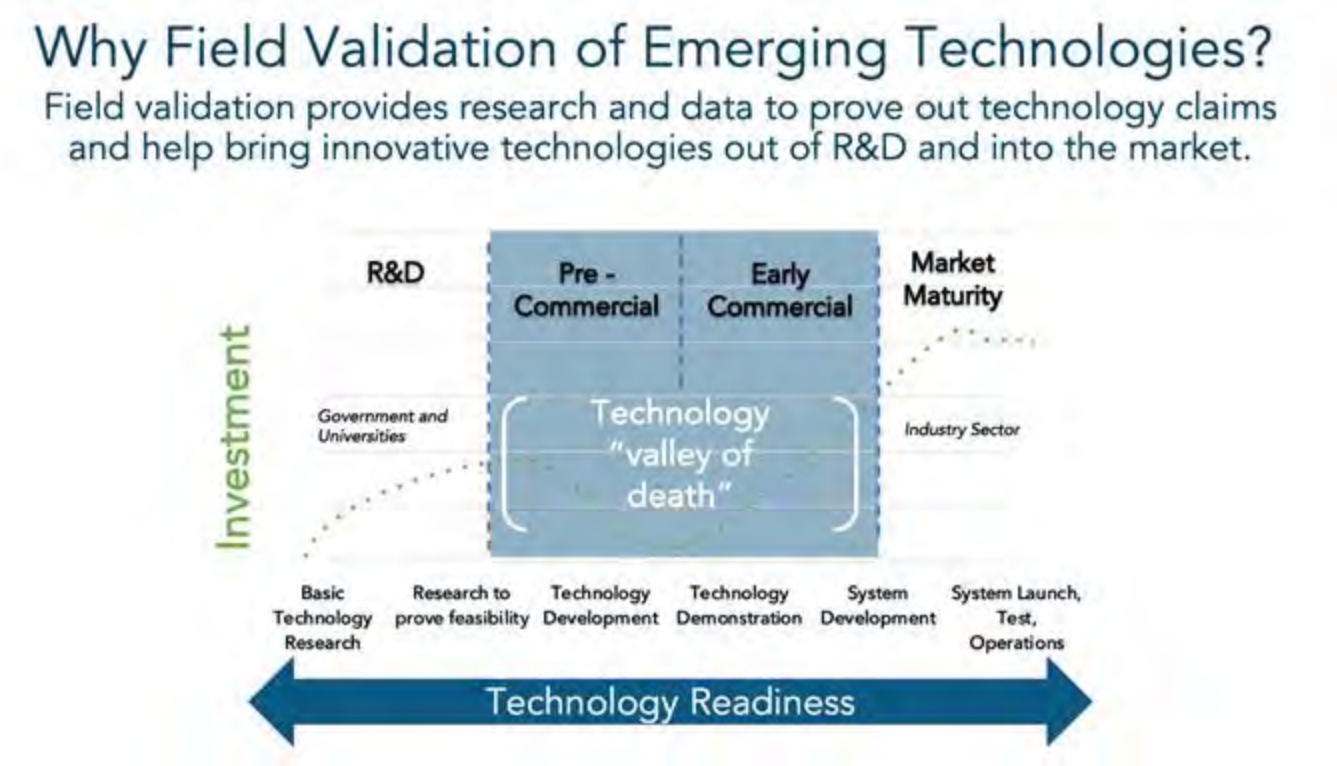
Onsite Energy Program

The U.S. Department of Energy's (DOE) Onsite Energy Program provides technical assistance, market analysis, and best practices to help industrial facilities and other large energy users increase the adoption of onsite clean energy technologies.

battery storage | combined heat and power | district energy | geothermal | industrial heat pumps | renewable fuels | solar PV | solar thermal | thermal storage | wind

DOE's Industrial Technology Validation

- Aims to accelerate decarbonization in the industrial sector by evaluating and de-risking the adoption of promising emerging technologies
- Mitigates technology adoption risks by objectively validating emerging decarbonization technologies in real-world industrial environments
- Helps industry evaluate potentially cost-effective, innovative technologies with the opportunity for significant energy savings/carbon reduction and widespread adoption



Contact us at ITV-Support@lbl.gov

DOE Industrial Software Tools

Designed to help energy and sustainability teams identify savings opportunities in their operational energy usage and emissions

Industrial Systems

- **MEASUR**
- 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
- Carbon Emissions Calculator
- Waste Stream Energy Content

Easier-to-Access Future

Management Guidance	Data Tracking & Reporting	Onsite Assessments
50001 Ready Navigator	VERIFI	MEASUR

Interconnectivity

- Develop an Energy Management System
- Learn how to better understand energy use
- Guidance for each step including understand energy use, quantifying annual savings, finding opportunities
  - Training guides to VERIFI to help with quantification steps

- Understand current energy use/GHG emissions
- Understand current progress on reduction goals
- Begin to explore how energy is used in facilities
  - Not yet implemented feature
  - Integrate PEPEx & the Footprint tool

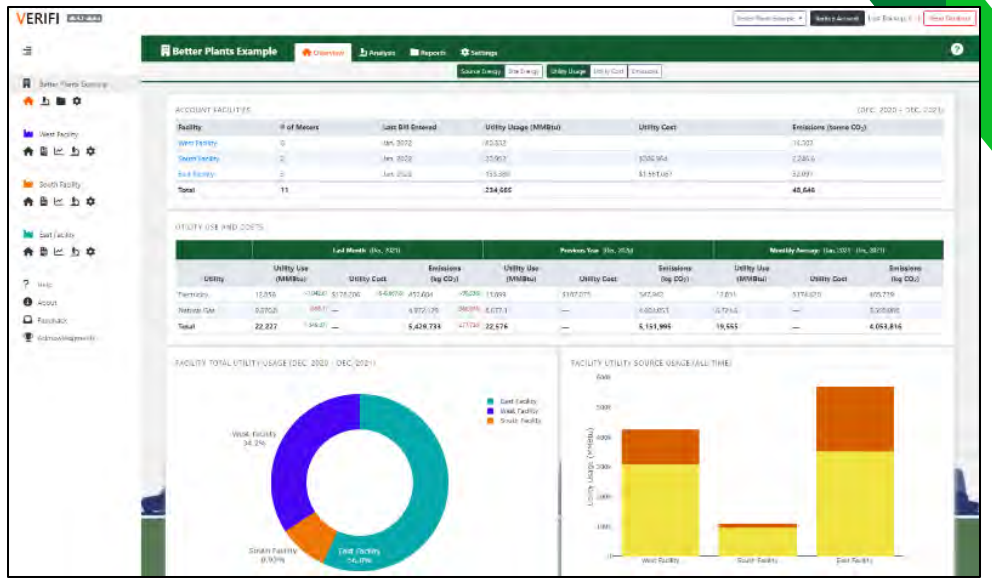
EnPI/EnPI Lite
PEPEx
Footprint

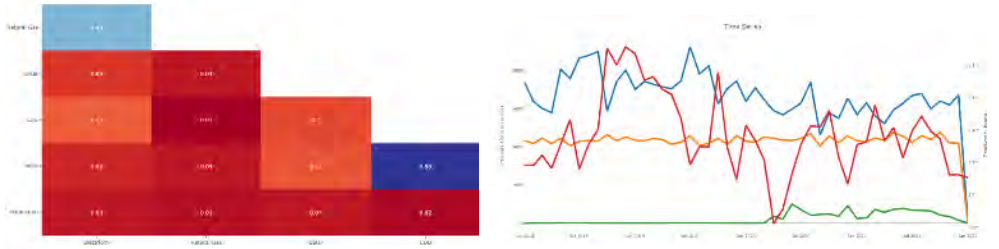
- Better understand facility energy use
- Find & quantify savings opportunities projects
- Begin to build case to management

Equipment Tools
PWP

VERIFI Software Suite

- Comprehensive **Utility Tracking and Reporting** Dashboard tool
- Promotes a **common framework** for analysis and reporting
- **Simplify and standardize** data entry, tracking, benchmarking and baselining for companies
- **Streamlines reporting** for companies
- Continue moving companies to more robust tracking methodologies
- Audience: Energy & Sustainability Managers, Data Analysts, Procurement





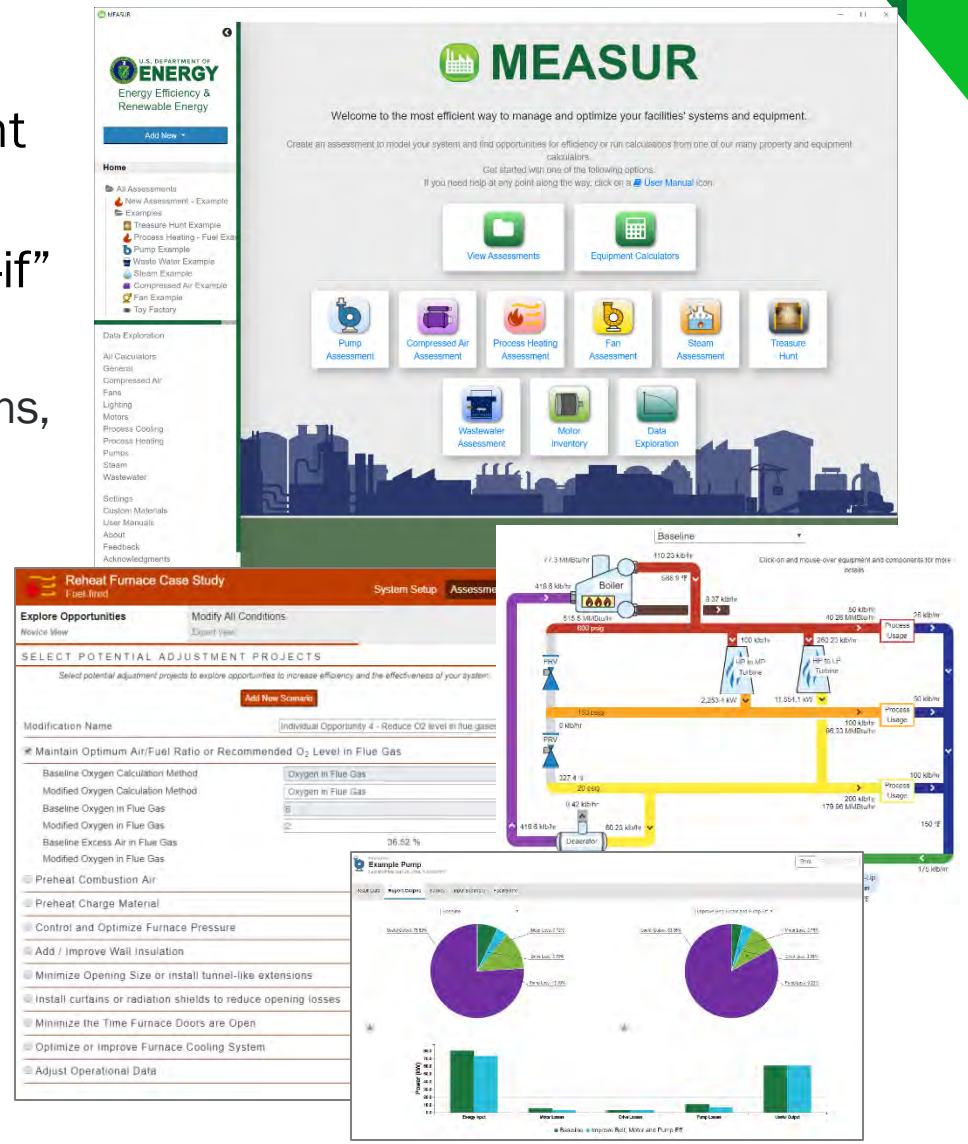
	Energy (MMBtu)			Incremental Improvement	
Year	Actual	Modeled	Adjusted for Normalization	Total Savings % Improvement	Cummulative Savings
2018	32,240	32,302	32,240	—	—
2019	30,917	31,892	31,831	2.87 %	913.91
2020	19,407	21,232	21,171	8.33 %	2,677.7
2021	20,952	23,176	23,115	9.35 %	4,840

Online - https://verifi.ornl.gov/ Download - https://ornl-amo.github.io/

MEASUR Software Suite
Manufacturing Energy Assessment Software for Utility Reduction

- **Energy and Carbon optimization software tool** to help manufactures improve the efficiency of systems and equipment within a plant
- **Model common energy systems** and evaluate unlimited "What-if" Scenarios
  - Perform full assessments on Steam, Process Heating, Pumps, Fans, Compressed Air Systems, etc
  - Identify and quantify major areas of energy and carbon use and savings
  - Dynamically create custom reports
- 70+ simple standalone calculators
  - **Quantify savings** for common opportunities
  - Perform your own facility Treasure Hunt

– Audience: Energy Managers, Plant Engineers, Maintenance Leads, Consultants, etc



https://www.energy.gov/eere/iedo/measur (Available for Windows, Mac & Linux)
https://measur.ornl.gov (Online with most browsers)

Energy Treasure Hunts

A strategy for finding no and low-cost energy savings opportunities

United States Environmental Protection Agency

Why Energy Treasure Hunts

- Use your team to find savings
- Create a focus on low-cost operational improvements with quick results
- Establish a focus of continuous improvement and cross-functional collaboration
- Establish an action plan for project implementation
- Engage senior management and financial decision makers to authorize action on projects

EPA United States Environmental Protection Agency

How to carry out Treasure Hunts!

- Treasure Hunts can be used to:
  - Find no and low-cost energy savings opportunities
  - Build a focus on energy efficiency
- The ENERGY STAR Energy Guide for Asphalt Mix, NAPA QIP-132, and Treasure Map can be used to identify savings opportunities.
- MEASUR can be used to help quantify and organize treasure hunt savings opportunities.

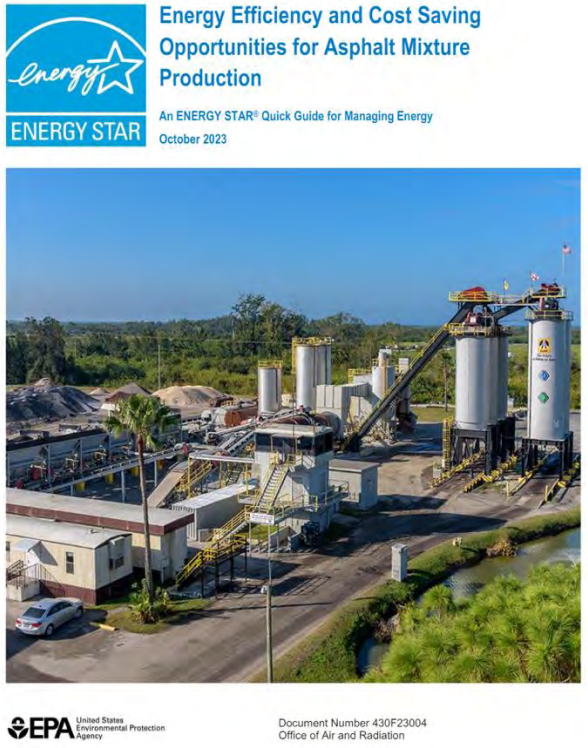
Asphalt Mixture Production Energy Guide

https://www.energystar.gov/sites/default/files/tools/ES_Asphalt_Paving_Guide_October23_RELEASE_508.pdf

Over 50 ways to improve energy use at asphalt mix plants

Content includes:

- Where energy is used in mix production
- Principles of energy management and savings
- Energy efficiency opportunities in:
  - Common plant systems
  - Production processes



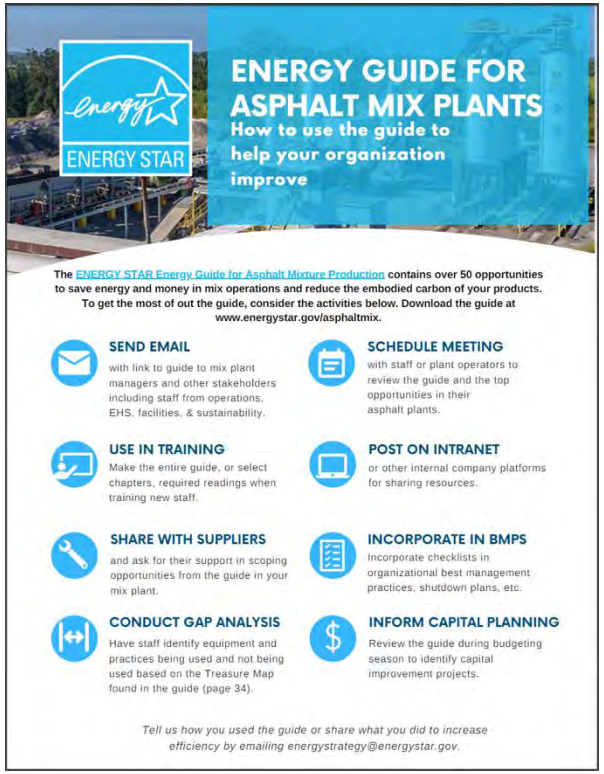
How to Use the Asphalt Energy Guide

https://www.energystar.gov/sites/default/files/2024-01/How%20to%20use%20the%20Asphalt%20Guide.pdf

Tip sheet available!

Recommendations:

- Share the guide within your organization
- Share the guide with suppliers; ask for support
- Use the guide in training
- Meet with operators to review top opportunities
- Incorporate the guide's checklists in organizational best management practices



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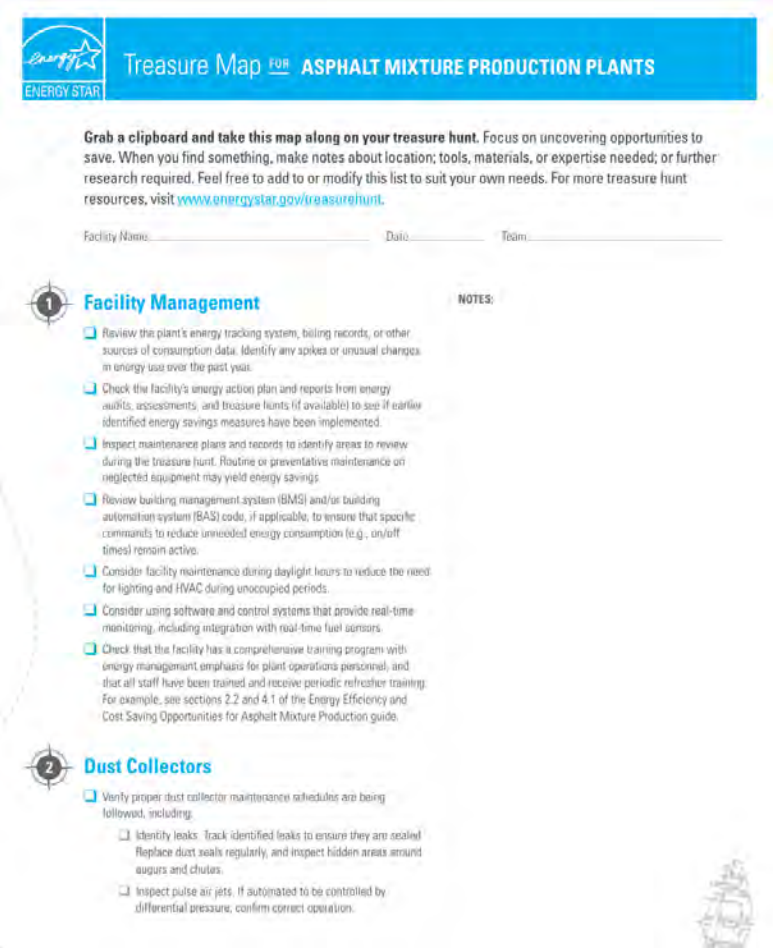
Treasure Hunt Maps

https://www.energystar.gov/industrial_plants/treasure_hunt/resources/treasure_maps

- Identify common energy savings opportunities
- Especially helpful to people less familiar with energy efficiency considerations
- Fifteen buildings maps
- Four industrial maps, one for asphalt!
- Available in English and Spanish



ENERGY STAR

Treasure Map FOR ASPHALT MIXTURE PRODUCTION PLANTS

Grab a clipboard and take this map along on your treasure hunt. Focus on uncovering opportunities to save. When you find something, make notes about location; tools, materials, or expertise needed; or further research required. Feel free to add to or modify this list to suit your own needs. For more treasure hunt resources, visit www.energystar.gov/treasurehunt.

Facility Name _____ Date _____ Team _____

1 Facility Management

NOTES:

- ❑ Review the plant's energy tracking system, billing records, or other sources of consumption data. Identify any spikes or unusual changes in energy use over the past year.
- ❑ Check the facility's energy action plan and reports from energy audits, assessments, and treasure hunts (if available) to see if earlier identified energy savings measures have been implemented.
- ❑ Inspect maintenance plans and records to identify areas to review during the treasure hunt. Routine or preventative maintenance on neglected equipment may yield energy savings.
- ❑ Review building management system (BMS) and/or building automation system (BAS) code, if applicable, to ensure that specific commands to reduce unneeded energy consumption (e.g., on/off times) remain active.
- ❑ Consider facility maintenance during daylight hours to reduce the need for lighting and HVAC during unoccupied periods.
- ❑ Consider using software and control systems that provide real-time monitoring, including integration with real-time fuel sensors.
- ❑ Check that the facility has a comprehensive training program with energy management emphasis for plant operations personnel, and that all staff have been trained and receive periodic refresher training. For example, see sections 2.2 and 4.1 of the Energy Efficiency and Cost Saving Opportunities for Asphalt Mixture Production guide.

2 Dust Collectors

- ❑ Verify proper dust collector maintenance schedules are being followed, including:
  - ❑ Identify leaks. Track identified leaks to ensure they are sealed. Replace dust seals regularly, and inspect hidden areas around augurs and chutes.
  - ❑ Inspect pulse air jets. If automated to be controlled by differential pressure, confirm correct operation.

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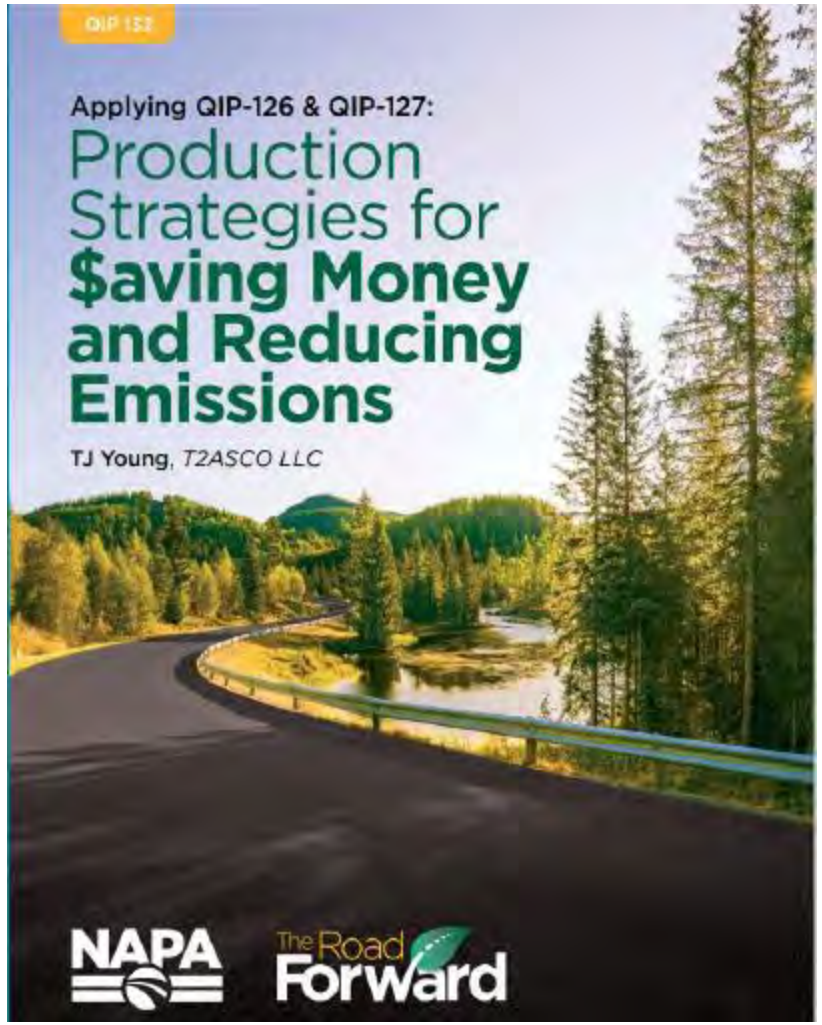
NAPA QIP-132

- Hot oil heater & insulation efficiency
- Drying efficiency
- Stockpile moisture
- Target drying fuel consumption expectations

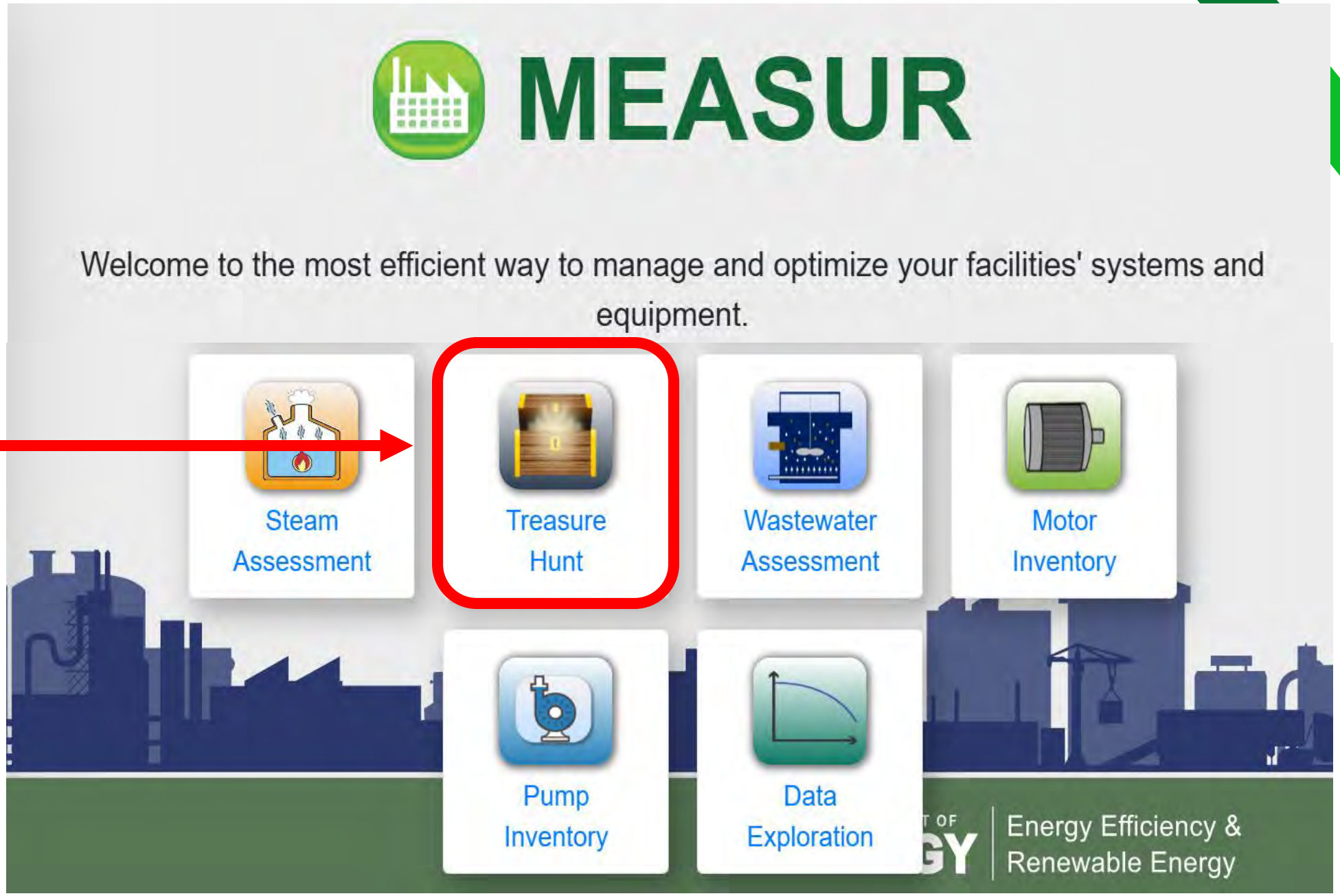


About MEASUR

https://measur.ornl.gov/landing-screen

- Tool to identify, quantify, and validate energy savings opportunities
- Maintained by U.S. Department of Energy
- Open-source software
  - Data is stored on your device
- Features
  - Modules to create inventories of your pumps and motors
  - Over 70 standalone calculators (pumps, compressed air, lighting, etc.)
  - Modules for carrying out different types of energy assessment types
    - Including a “Treasure Hunts” assessment

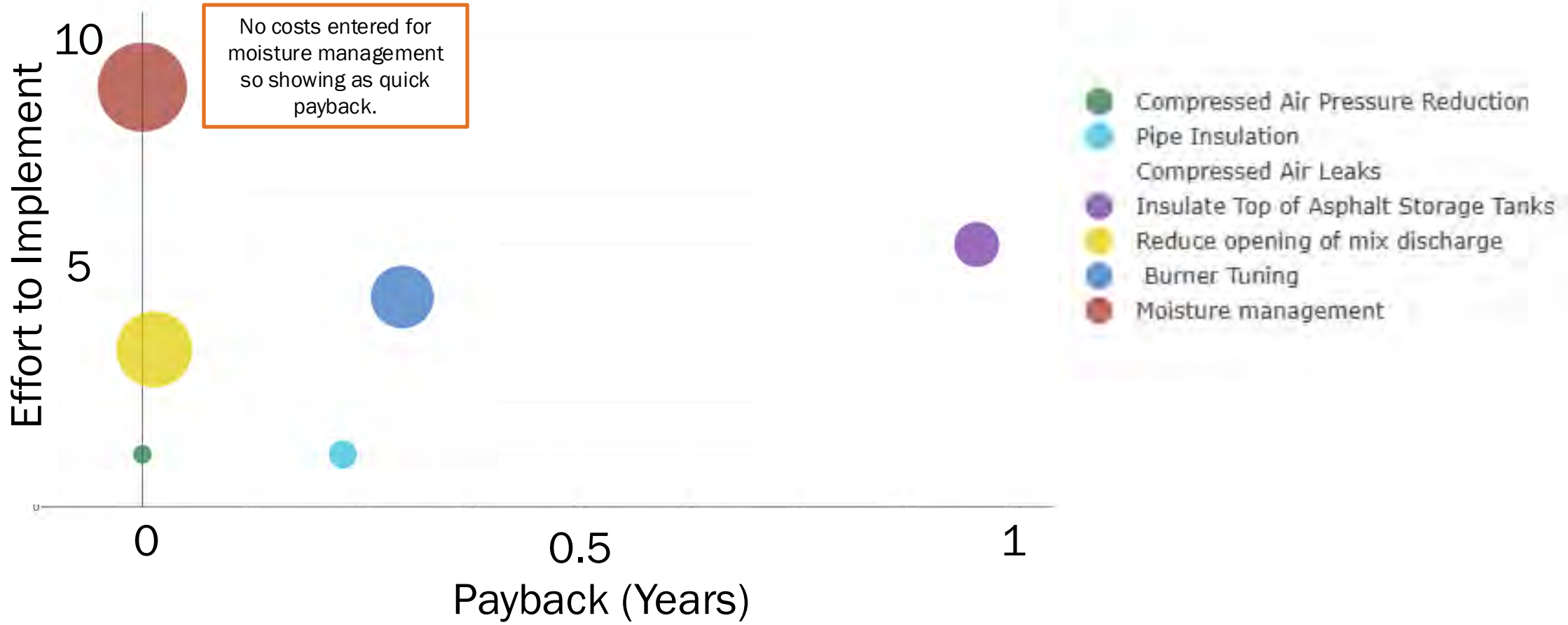
- Go to https://measur.ornl.gov/landing-screen
- Click “Treasure Hunt.”



Reports: *Opportunity Summary*

What projects should you prioritize?

Executive Summary | Opportunity Summary | Opportunity Payback Details | **Report Graphs** | Facility Info



Taking Action on your Action Plan

-OR-

Identify 2-3 low-cost savings opportunities that can be implemented at your plant(s). Consult the

Asphalt Energy Guide and Asphalt Mixture Production Treasure Map resources for ideas.

- Identify one plant to hold a treasure hunt.
- Identify who will be participate in treasure hunt.
- Identify the tools you will use to identifying calculate savings opportunities.

ENERGY STAR

Asphalt Plant Energy Performance Peer Exchange (APEX)

- ENERGY STAR & NAPA initiative
- Peer exchange to:
  - Share best practices
  - Hear about new tech
  - Learn about resources

Sign up here

United States Environmental Protection Agency

ENERGY STAR Energy Performance Indicator (EPI) for Asphalt Mix Plants

Tells you how energy efficient your asphalt plant is compared to asphalt plants with similar characteristics using a 1-100 score.

Download at:

www.energystar.gov/EPIs

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Certified Plants to Date

Submit your plant certification applications by April 30th to be included in a June announcement.

Cadillac Asphalt LLC
Rawsonville Plant, Belleville, MI

Callanan Industries, Inc.
Cordell Rd – Drum Plant, Schenectady, NY

Inland Asphalt a CRH Company
Sullivan Plant, Spokane, WA

Rogers Group Inc.
Candora Asphalt Plant, Knoxville, TN
Huntsville Asphalt Plant, Huntsville, AL

Tilcon Connecticut Inc.
New Britain Drum Plant, New Britain, CT

Asphalt plants that score a 75 or higher on the EPI are eligible for ENERGY STAR Certification

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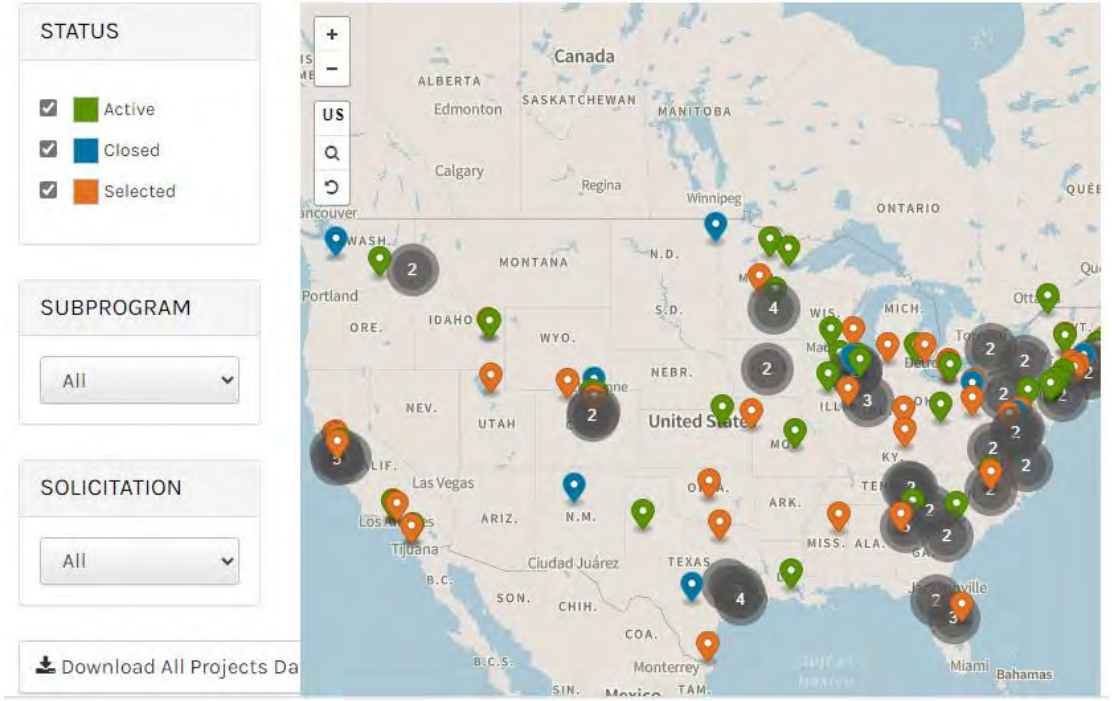
Thank You!

Subscribe to our newsletter “**The Production Line**” to get the latest information on:

- Announcements
- Funding opportunities
- Events
- Tool and resources
- And more!

www.energy.gov/eere/iedo/subscribe-iedo-newsletter

IEDO Project Database



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Questions?

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