



NASEO State Industrial Working Group Forum: NIST Manufacturing Extension Partnership and EPA ENERGY STAR Program for Industry

July 12, 2023, 3:00 pm ET

Welcome and Introduction to NASEO Industrial Working Group

Rodney Sobin, Senior Fellow, NASEO

EPA ENERGY STAR Program for Industry

Elizabeth Dutrow, Director, Industrial Sector Partnerships, EPA Energy Star

NIST Manufacturing Extension Partnership

Jyoti Malhotra, Ph.D., Division Chief, National Programs and Platforms Division, NIST MEP

Jose Colucci-Rios, PE, Ph.D., Industrial Specialist, National Programs Division, NIST MEP

Brian Lagas, Industrial Specialist, National Programs Division, NIST MEP

Q&A



NASEO State Industrial Working Group Forum: NIST Manufacturing Extension Partnership and EPA ENERGY STAR Program for Industry

July 12, 2023, 3:00 pm ET

Logistics:

- Please mute when not speaking.
- Please use Q&A box or chat to offer questions.
- We will record and post presentations.

+ NASEO State Industrial Working Group

<https://www.naseo.org/naseo-state-industrial-working-group>

- Help State Energy Offices and others to identify, develop, and enhance resources to advance clean manufacturing/industry.
- Enhance cooperation and coordination across technical and business assistance programs.
- Support economic development and productivity, emissions and environmental, and energy reliability and resilience objectives.
- Strengthen existing industries.
- Advance new technologies and industries.

Thank you to the U.S. DOE and its Industrial Efficiency and Decarbonization Office (IEDO) for generous support.

Inquiries: industry@naseo.org

+ NASEO State Industrial Working Group

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■ Working Group

California	North Carolina
Colorado	Pennsylvania
Connecticut	South Carolina
Indiana	Tennessee
Kentucky	Utah
Maine	Virginia
Michigan	Washington
Mississippi	Wisconsin
New York	

■ State Energy Offices and others

Inquiries: industry@naseo.org

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■ Web resources and e-mail updates

- Technical and business assistance programs
- Funding and financial provisions (incl. IJJA/BIL & IRA)
- Reports, studies, tools, organizations
- Events

■ Recent items

- DOE grants for small and medium-sized manufacturers to implement IAC, CHP TAP recommendations
- DOE Pathways to Commercial Liftoff: Industrial Decarbonization, June 28, 2023, interim webinar [presentation](#).
- Renewable Thermal Collaborative – webinar, Policy Finder, *Industrial Electrification in U.S. States* report, state fact sheets, Heat Pump Decision Support Tools...
- BlueGreen Alliance, [Map and Analysis: Building a Strong Manufacturing Base for Clean Energy in the US](#) – offers two tools that can support State Energy Offices and others to understanding domestic clean energy technology supply chains.
- Qualifying Advanced Energy Project Credit Program (48C)
- EPIX (Electrified Processes for Industry Without Carbon) - New Manufacturing USA Institute at Arizona State University
- RFI Domestic Manufacturing Conversion Grants for EVs
- Various DOE FOAs pertinent to manufacturing
- ENERGY STAR 2022 certified plants

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■ Forums (states only) and webinars

■ Past

- Renewable Thermal Collaborative (webinar): Renewable Thermal Vision and Industrial Electrification in U.S. States (June 14, 2023)
- DOE Advanced Energy Manufacturing Grants and Industrial Demonstrations Programs and Connecticut Focus (March 1, 2023)
- Industrial Assessment Centers and Complementary TA Programs [CHP/Onsite Energy TAPs, Better Plants] (May 3, 2023)

■ Upcoming

- Tentative September 13, 2023, 3:00-4:30pm ET: Topic TBD. *Forums limited to state participants.*

■ Candidate future topics:

- IRA tax credits: 45X and 48C
- DOE Industrial Decarbonization Roadmap; DOE Heat Shot
- Defense Production Act; CHIPS and Science Act provisions
- Plus, State Focus Features

■ State cases studies – experiences, lessons

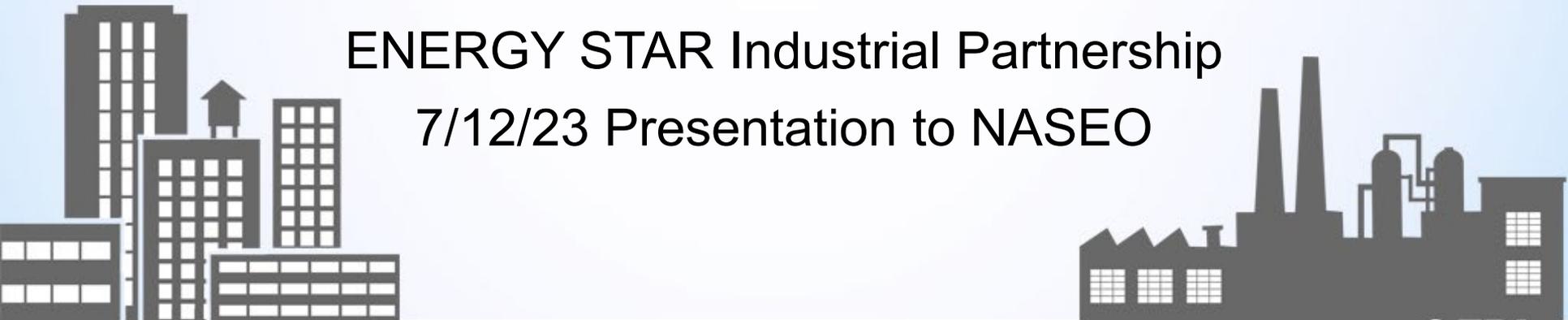
We welcome your feedback and suggestions!

industry@naseo.org



ENERGY STAR drives energy efficiency & emission reductions for manufacturers

ENERGY STAR Industrial Partnership
7/12/23 Presentation to NASEO



Overview

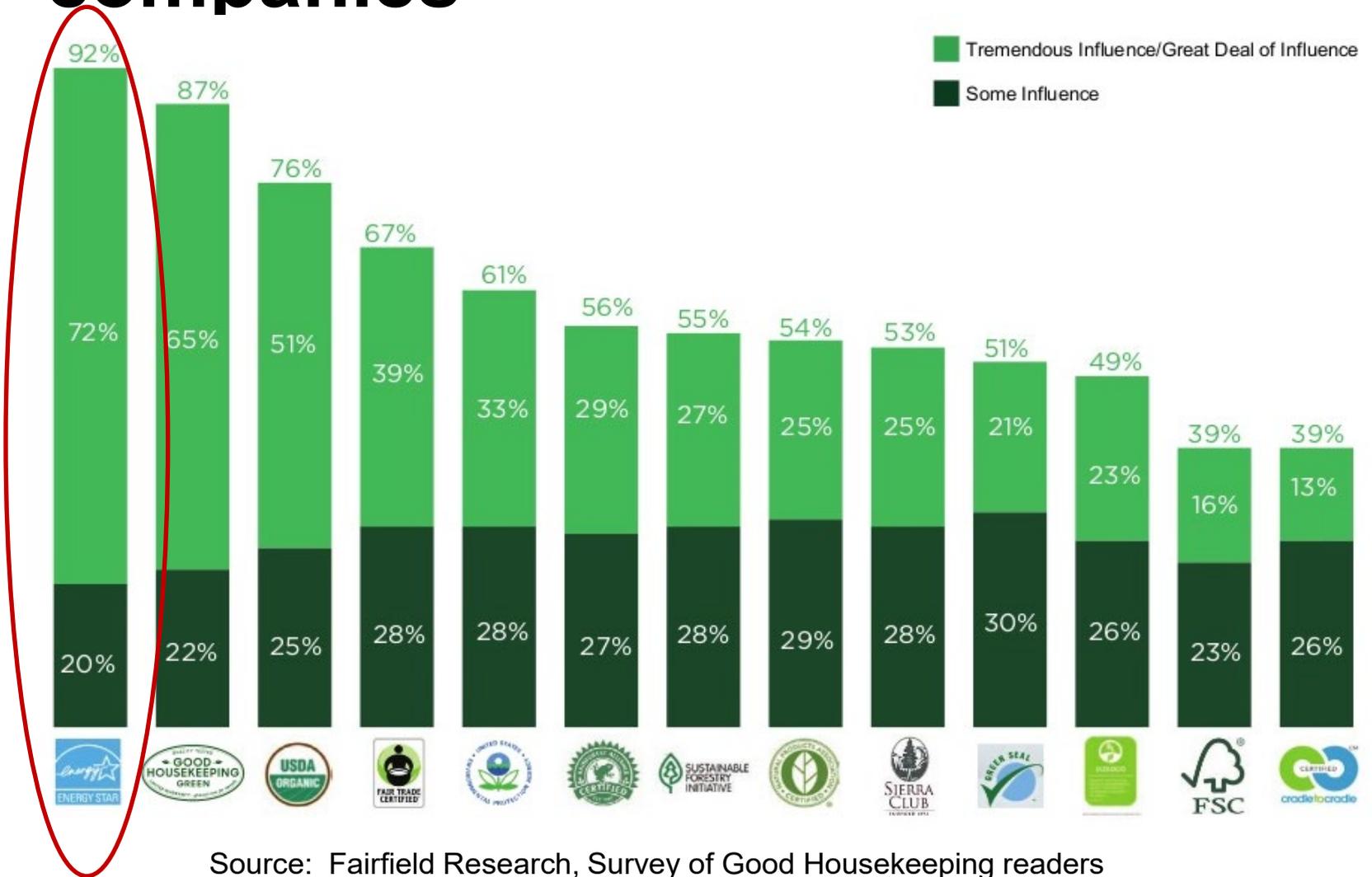
- What is ENERGY STAR?
- The focus on industrial energy efficiency & why
- How ENERGY STAR has worked with manufacturers & new ways ENERGY STAR will work with them in the future
- Energy management resources you can use with manufacturers

ENERGY STAR

- Voluntary government partnership program
- Established by EPA in 1992 to help address climate change
 - Helps businesses & consumers to achieve the best energy efficiency
- Focused on:
 - Products
 - Homes
 - Buildings & **Industrial Plants**
 - Over 800 industrial companies are partners.
 - Thousands of plants under management.
- The national symbol for energy efficiency
 - Public awareness exceeds 90%



We find the brand attracts companies



Source: Fairfield Research, Survey of Good Housekeeping readers

The business case for energy efficiency

- Saves a company money
- Is a low-risk investment that pays back
- Available now

*Energy efficiency is needed now
to ensure limited renewables
are not wasted and go farther*

ENERGY STAR works with manufacturers

- By industry
 - Through ENERGY STAR Focus Industries
- By company
 - Using ENERGY STAR resources and tools for energy management
- Soon by regional hubs

By the industry: ENERGY STAR Focus Industries

- Specialized work with specific industries to address energy efficiency in their operations
- Focuses provide:
 - ✓ **Energy guide** on opportunities in industry's plants
 - ✓ **Plant energy performance indicator (EPI)** to benchmark energy performance of plants in the industry
 - ✓ **Networking** of industry's energy managers to share best practices



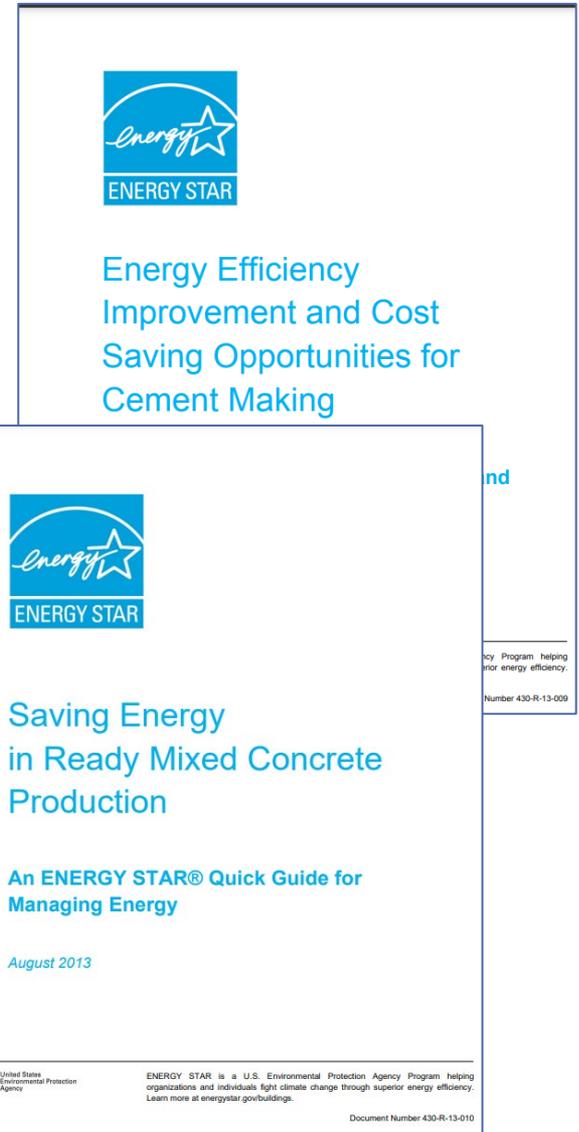
ENERGY STAR Focus Industries

- Aerospace
- Ammonia / Nitrogenous Fertilizer
- Asphalt Pavement
- Breweries
- Cement & Concrete Manufacturing
- Chlor Alkali Production
- Food - Corn Refining
- Food - Fluid Milk and Yogurt Processing
- Food - Commercial Bread & Rolls Bakeries
- Food - Cookies & Crackers Bakeries
- Food - Cereal Manufacturing
- Food - Distilleries
- Food - Frozen Fried Potato Products
- Food - Juice
- Food - Tomato Canning
- Glass - Fiberglass
- Glass - Flat glass
- Glass - Container glass
- Metals - Aluminum Casting
- Metals - Iron Casting
- Metals - Investment Steel Casting
- Metals - Carbon/Alloy Casting
- Motor Vehicle - Assembly Plants
- Motor Vehicle - Engine Plants
- Motor Vehicle - Transmission Plants
- Petrochemical Manufacturing
- Petroleum Refining
- Pharmaceuticals
- Printing
- Paper – Integrated Paper Mills
- Paper - Pulp Mills
- Steel - Integrated Mills
- Steel – EAF Mills

ENERGY STAR Energy Guides *use & share these*

An Energy Guide is a compilation of measures for improving energy efficiency in a manufacturing plant

- Background on how energy is used in the industry
- Guidance on how to build an energy program
- Covers general plant systems (i.e., lighting, pumps, compressed air, etc.)
- Discusses specific manufacturing systems (e.g., brine preparation, electrolysis)
- Information reported on energy and cost savings, payback period, etc., where available
- www.energystar.gov/energyguides



Energy performance indicators

- An energy management tool
- A data-based way to judge how efficient a plant should be by comparing it to its industry
- EPA develops the indicator with actual data from industry – plant, production and more
- Reviewed by the industry before releasing
- *If you are working with a plant, you can access the data to use these tools to score the energy performance of the plant*

ENERGY STAR EPI –score a plant's energy performance

Is 6 MMBtu/ton of clinker high or low for an average cement plant?

ENERGY STAR EPIs score plant energy performance

1 - 100



STATEMENT OF ENERGY PERFORMANCE
Version 3.1, Release 06/16/2022

 ENERGY STAR

Enter Name _____
For 12-month period ending: Enter Month/Day/Year _____

Facility Address Enter Name _____ Street Address _____ Address 2 _____ Durham, NC 27705	Owner's Address Owner's Name _____ Street Address _____ Address 2 _____ City, State _____ ZIP _____	Energy Manager Contact Contact Name _____ Email Address _____ Phone Number _____
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Cement Manufacturing Plant Energy Performance Indicator

Energy Performance Score:	100
GHG Savings (Kg CO ₂ e)	7
Source Energy Savings (MMBtu, HHV)	0
Site Energy Savings (MMBtu, HHV)	0

Professional Verification
Professional Engineer Name _____
Address _____
Address 2 _____
City, State ZIP _____
Phone Number: _____
Email Address: _____
License Number: _____
Licensing State: _____

EPI Verification - choose "Yes" for one option
BEFORE PRINTING:

<input type="checkbox"/> No	EPI attached for EPA review.
<input type="checkbox"/> No	EPI contains proprietary information and has been sent to the designated reviewer. (Note: do not send proprietary data to EPA.)

Professional Engineer Stamp

Based on the conditions observed at the time of my visit to this facility, I certify that the information used in this tool to generate the energy performance score represented on this statement is accurate.

The 1-100 score answers the question.

ENERGY STAR Plant Certification

- EPA & Natural Resources Canada distinguish the best performing plants within an industry with ENERGY STAR certification.
- ENERGY STAR defines a score of 75 or above as energy-efficient using approved plant energy performance indicators
- Plants with verified and proven performance using the EPI may apply for certification from EPA's ENERGY STAR
- www.energystar.gov/plants



2023 ENERGY STAR
CERTIFIED FACILITY

This facility meets strict
energy performance levels
set by the U.S. EPA.

www.energystar.gov



By plant or company:

**ENERGY STAR tools help
manufacturers
improve and save**

www.energystar.gov/industry

GOAL:

Get manufacturers on the path to energy management and keep them there

Ways ENERGY STAR helps manufacturers

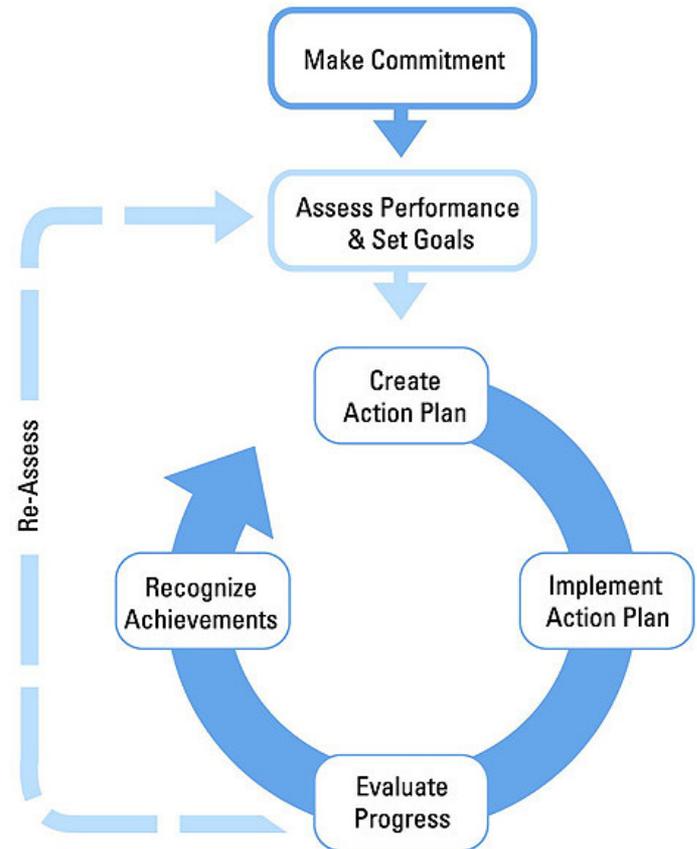
- **Intuitive Tools** to help build an energy program
- **Energy Treasure Hunt** resources to help identify easy savings and build energy teams
- **Technical energy guides** that identify savings in plants
- **Goal Setting** to pursue recognition opportunities
- **National network** of energy managers that discuss and share best practices
- **Strategic industrial energy advisers** to coach companies that join the ENERGY STAR partnership

Basic energy management:

ENERGY STAR Guidelines for Energy Management - central tool for instructing manufacturers on how a program works

- Easy guide on how to develop an energy program
- Based on best practices of successful ENERGY STAR partner companies
- Structured on a “plan-do-check-act” approach (ISO 50001 was informed by the guidelines)
- Using the guidelines does not require certification

www.energystar.gov/guidelines



ENERGY STAR gap analysis tools decide where energy management needs help

Quick and easy – regardless of
plant/company size

Compare a plant's actual energy
management practices with best practice

Gap analysis creates a quick look at
where to improve

10 minutes is what it takes to use

Evaluate energy management practices

ENERGY STAR offers several energy management assessment tools for conducting gap analysis:

- Corporate Energy Program Assessment Matrix
- Facility Energy Program Assessment Matrix
- Small Manufacturing Assessment Matrix

Facility Name:		Assessment Date:		
	Little or no evidence	Some elements/degree	Fully implemented	Next Steps
Energy Champion	None identified.	Senior manager implicitly supports the energy program.	Senior manager actively supports the energy program and promotes energy efficiency.	
Energy Leader	None assigned.	Assigned responsibilities but not empowered. Less than 25% of time is devoted to energy.	Recognized and empowered leader of energy program, with senior management support.	
Energy Team	No site energy team.	Informal organization with sporadic activity.	Active cross-functional team guiding the energy program.	
Track & Analyze Data	Limited metering or tracking. No demand analysis or billing evaluation.	Some metering, tracking, analyzing, and reporting. Energy bills verified for accuracy.	Key loads metered, tracked, analyzed, and reported. Facility peak demand analyzed.	
Assessments & Best Practices	No formal or external reviews.	Limited review by vendors or energy leader.	Regular reviews by multi-functional team of internal and external professionals identifying opportunities and Best Practices.	
Goals & Plan	Energy reduction goals not established.	Loosely defined. Little awareness of energy goals. Limited plans to achieve goals.	Goals established and publicized at all levels. Plans are defined and implemented to achieve goals.	
Communications & Awareness	No formal communications.	Periodic communications on energy and projects.	All personnel are addressed on regular basis using posters, displays, emails, reports, or similar tools.	
Training	No training offered.	Some vendor training for key individuals and operators.	Formal and informal training is scheduled. Best practices are communicated and used.	
Reviews	No reviews.	Informal check on progress.	Regular reviews of energy performance, with senior management addressing goals and plans.	
Recognition	Not addressed.	Occasional recognition of projects and people.	Recognition system in place. Meaningful awards for projects and personnel.	

https://www.energystar.gov/industrial_plants/measure-track-and-benchmark/tools-benchmarking-energy



Finding energy savings in plants: Treasure hunts

- Simplified plant assessments that engage internal teams in the search for energy savings
- Treasure hunts are designed to build plant ownership of findings
- Original treasure hunts were done by Toyota
- Original treasure hunt guidance written by Toyota's energy manager

Simple Treasure Hunt Resources



- www.energystar.gov/treasurehunt
 - Treasure Hunt how to guide
 - Treasure maps – general manufacturing plants, ready mix concrete plants, breweries
 - Videos of hunts
 - Case studies
 - Spanish resources

Treasure Map for Manufacturing



- General treasure map for manufacturing plants
 - https://www.energystar.gov/sites/default/files/tools/ES_Treasure_Hunt_Checklist_MfgPlants.pdf
- Covers:
 - Facility management
 - Production equipment
 - Compressed air
 - Motors
 - Hot water & steam systems
 - Pumps, piping systems
 - Fans
 - Lighting
 - Building envelope
 - Plug loads
 - HVAC
 - Chillers

Motivate plants to take on a basic improvement goal & raise visibility for energy initiatives



ENERGY STAR Challenge for Industry

- Set goal with reward for achievement
- Target: 10% improvement in energy intensity in 5 years or less
- Manufacturers' average savings ~20% in 2 years

Sign up plants to take the Challenge



- Register intensity baseline with EPA ENERGY STAR
- Help plant improve using ENERGY STAR and your own resources
- Achieve the goal & notify ENERGY STAR
- EPA recognizes achievers with logo, listing on website, congratulatory letter to CEO
- No penalties for non-achievement
- www.energystar.gov/industrychallenge

Additional forms of ENERGY STAR recognition to keep people & teams focused

ENERGY STAR recognition helps energy programs achieve new levels of performance and *build an energy culture*

ENERGY STAR Partner of the Year (POY)

Recognizes world-class corporate energy management programs.



ENERGY STAR Plant Certification

Recognizes plants for scoring 75 or higher using their EPI (aka achieving top quartile energy performance) in the US and Canada



Additional energy program resources – a sample

Teaming Up to Save Energy

- How to build an energy team



Partner Networking Web Conferences

- Showcases successful energy management strategies among the partnership.



Employee Engagement Materials

- Information, literature, and other resources to help build energy awareness among employees.



Communication Resources

- Posters, materials and tools to help you drive change.



Supportive network of manufacturers

- Manufacturers can be ENERGY STAR partners by making a making a commitment to manage energy
- Partners:
 - Learn energy strategies from partners,
 - Validate energy management efforts, and,
 - Boost company image through earned recognition.
- **Over 800 industrial companies are partners.**
 - Thousands of plants under management in these companies.
- Join at: www.energystar.gov/join



Plants across the US participate in ENERGY STAR

*denotes certified and Challenge plants

Alabama	35
Alaska	3
Arizona	47
Arkansas	9
California	127
Colorado	23
Connecticut	25
Delaware	2
Florida	35
Georgia	40
Hawaii	1
Idaho	7
Illinois	83
Indiana	78
Iowa	20
Kansas	17
Kentucky	48
Louisiana	14
Maine	16
Maryland	19
Massachusetts	23
Michigan	138
Minnesota	26
Mississippi	7
Missouri	23
Montana	4

Nebraska	12
Nevada	10
New Hampshire	5
New Jersey	30
New Mexico	10
New York	61
North Carolina	50
North Dakota	3
Ohio	68
Oklahoma	14
Oregon	37
Pennsylvania	52
Puerto Rico	15
Rhode Island	0
South Carolina	19
South Dakota	14
Tennessee	58
Texas	153
Utah	19
Vermont	1
Virginia	36
Washington	54
West Virginia	12
Wisconsin	53
Wyoming	2

Industry joins, networks, & learns from industry



Coming soon: Regional Hubs

- Goal: reach small and medium industry where it lives
 - Hubs supported by ENERGY STAR support, networking and ***outreach partners***
 - Future focus on all SMM but including an emphasis on construction material industries such as asphalt pavement, ready mix concrete, etc.
 - Can we include you as a partner in our new outreach?

Ways to take an advantage of ENERGY STAR for Industry

- ✓ Consider promoting industrial energy efficiency in your area if you haven't done so
 - ENERGY STAR would be happy to help you start
- ✓ Recommend the tools to industry you meet
- ✓ Refer industry to the program, and we will support them
- ✓ Join as a partner in our hubs. We will take all resources out to industry we meet.

Contact information

Elizabeth (Betsy) Dutrow

Leader, US EPA ENERGY STAR Industrial Partnership

(202) 343-9061

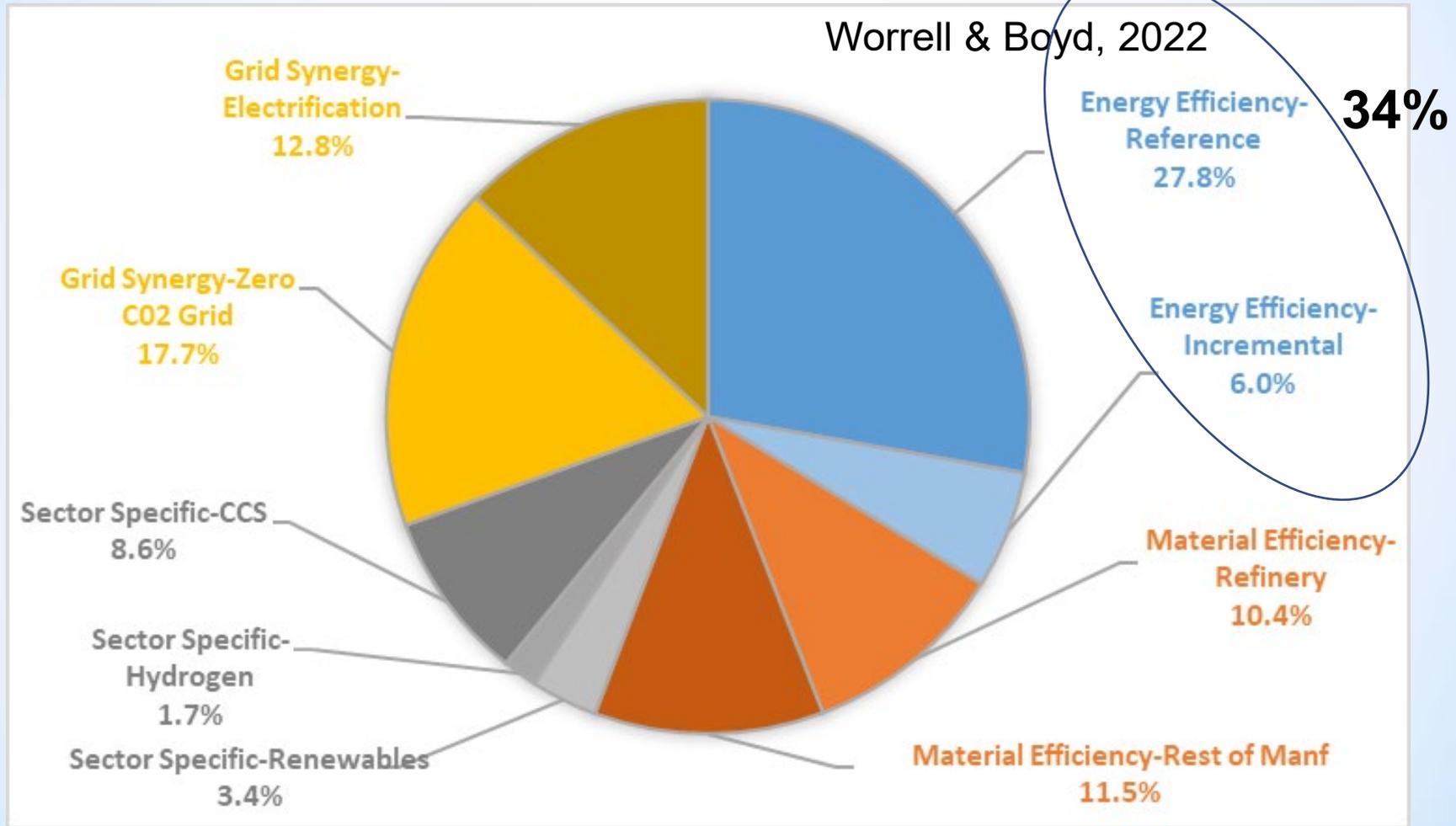
dutrow.elizabeth@epa.gov

All resources are located at: www.energystar.gov/industry

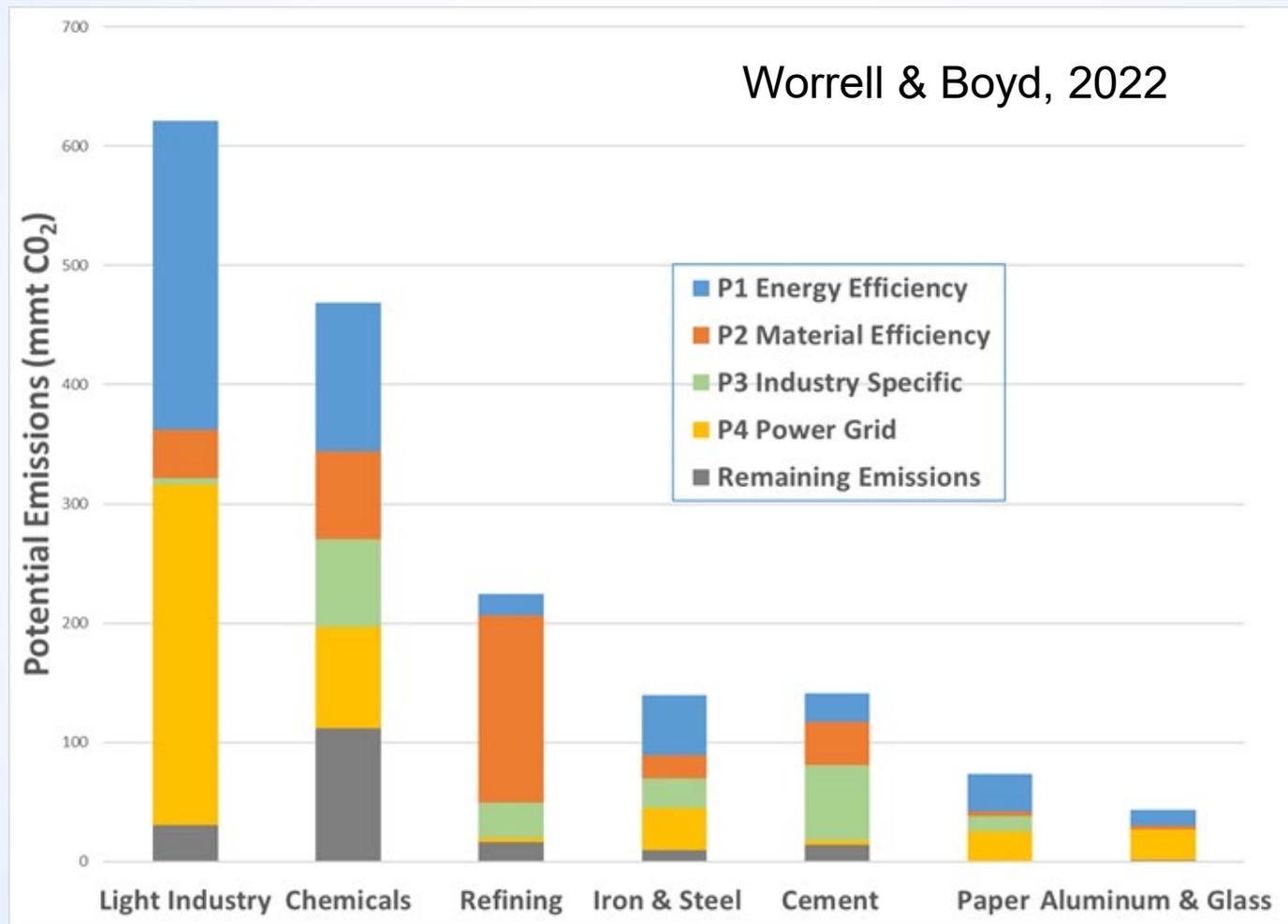
Sample of ENERGY STAR Partners



Study says: Energy efficiency can deliver over 1/3 of manufacturing's CO₂ emission reductions in 2050



All industries have energy waste and a large opportunity for energy efficiency





The MEP National Network

NASEO Industrial/Manufacturing Working Group Forum
July 12, 2023

Jyoti Malhotra, Ph.D., Division Chief
National Programs and Platforms Divisions, NIST MEP

José Colucci-Ríos, PE, Ph.D, Industrial Specialist
National Programs Division, NIST MEP

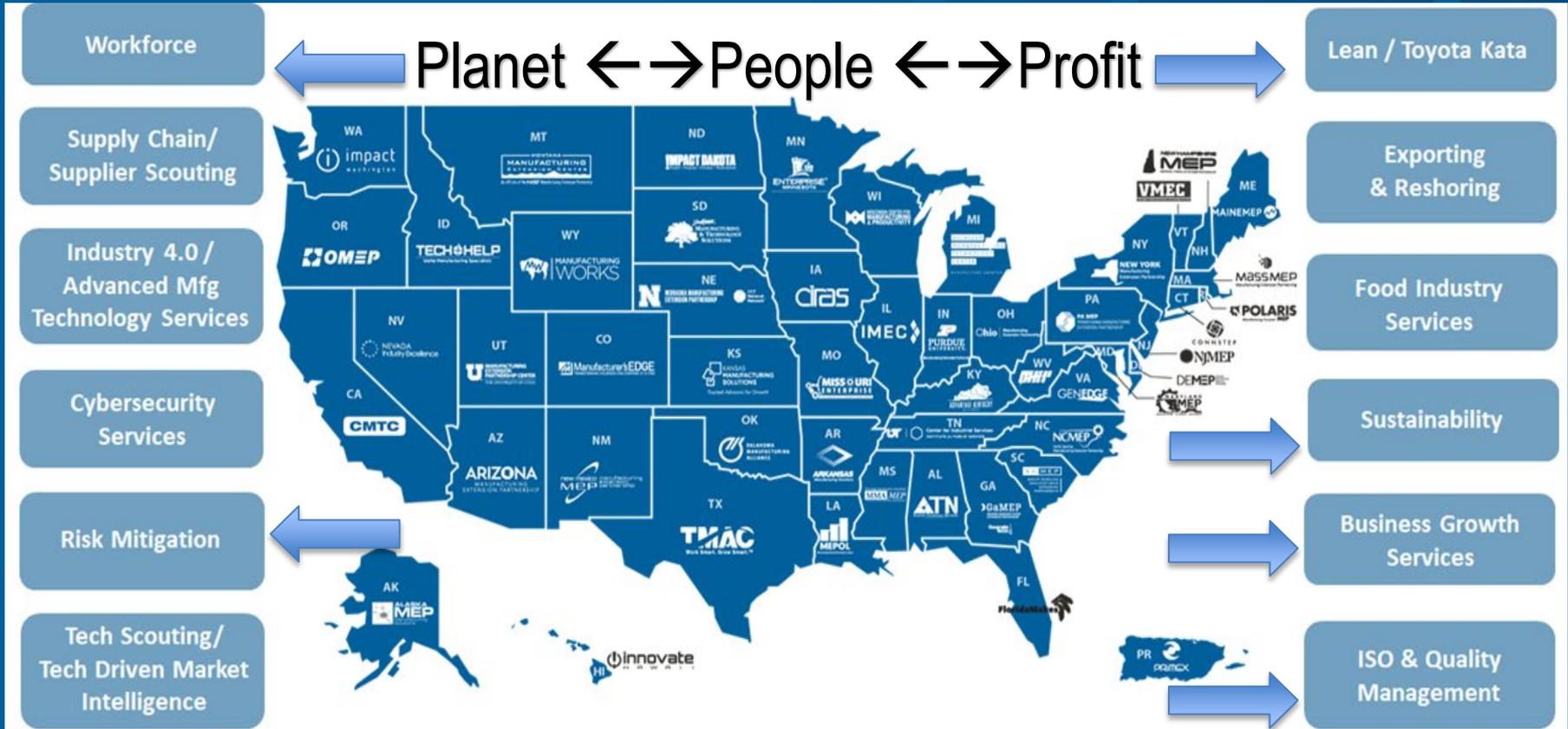
Brian Lagas, Industrial Specialist
National Programs Division, NIST MEP





A unique public-private partnership that delivers comprehensive, proven solutions to U.S. manufacturers, fueling growth and advancing U.S. manufacturing.

Our mission is to **strengthen and empower U.S. manufacturers.**





Over
1,450

Manufacturing Experts

PARTNERS

- Educational institutions
- Federal agencies & labs
- State & local government
- Economic development orgs, trade assns & other non-profits

Nearly
2,100

Service Providers & Partners

NATIONAL NETWORK

One Center in Every State and Puerto Rico



Approximately
430
Service Locations



Technology



➔

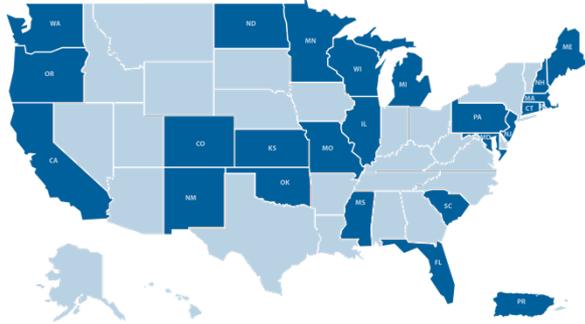
Transfer

Solving industry challenges together





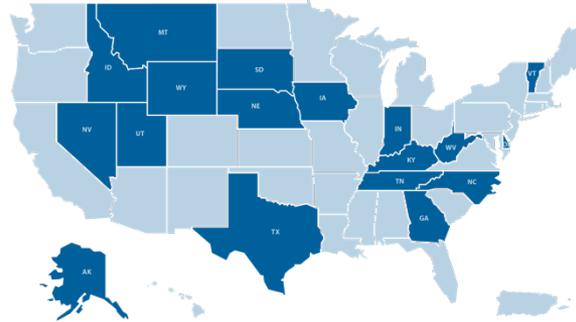
MEP Centers Organizational Structure



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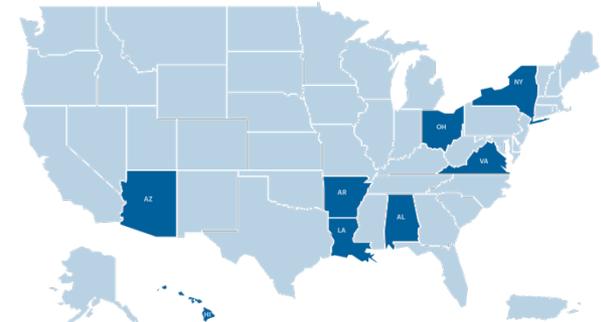
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|---------------|---------------|----------------|
| California | Maine | Oklahoma |
| Colorado | Michigan | Oregon |
| Connecticut | Minnesota | Pennsylvania |
| Florida | Missouri | Puerto Rico |
| Illinois | North Dakota | Rhode Island |
| Kansas | New Hampshire | South Carolina |
| Massachusetts | New Jersey | Washington |
| Maryland | New Mexico | Wisconsin |

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University - 18

- | | | |
|----------|----------------|---------------|
| Alaska | Kentucky | Tennessee |
| Delaware | Montana | Texas |
| Georgia | North Carolina | Utah |
| Iowa | Nebraska | Vermont |
| Idaho | Nevada | West Virginia |
| Indiana | South Dakota | Wyoming |



State - 8

- | | |
|----------|-----------|
| Alabama | New York |
| Arkansas | Ohio MEP |
| Arizona | Virginia |
| Hawaii | Louisiana |



Empowering Manufacturing: 2022 Impact Survey Results



For Every One Dollar of Federal Investment

\$35.80
in New Sales Growth


\$40.50
in New Client Investment


This Translates into More Than

\$5.6 BILLION
in New Sales


For Every

\$1,353 
of Federal Investment the Network Creates or Retains One Manufacturing Job



Helping Small and Medium-Sized Manufacturers Overcome Challenges



Narrowing the workforce gap



Mitigating supply chain vulnerabilities



Leveraging technology



Narrowing the Workforce Gap

Navigate the workforce shortage while improving productivity and profitability

- Upskilling
- Use of technology and productivity enhancements
- Partnerships
- Improving work conditions, job quality, career paths, etc.
- Assessing underserved populations and integrating them into the manufacturing industry
- Making the case for integration of underserved populations with SMMs

Build a pipeline of future manufacturing employees

- Rebranding the public image of manufacturing nationally and in the states
- Broadening partnerships and connections with educational and others working in this space



Workforce Projects





Building Domestic Workforce

Strong focus on underserved communities and manufacturers

Community	Centers Providing Services
Young professionals	37
Career-tech Students	36
Women	35
Veterans	34
High School Students	33
Community college students	31
Four-year college students	31
Displaced workers	24
Re-entry	21
New Americans / Recent immigrants	19
Middle School Students	15
Opportunity Youth (ages 16-24, not in school)	12
Special needs	12



Supply Chain Optimization & Intelligence Network (SCOIN)

- **Invested over \$20 million in MEP National Network to:**
 - Expand existing MEP Centers capacity to provide services focused on national supply chain optimization
 - Establish a National Supply Chain Intelligence Network that will:
 - Comprehensively support supplier scouting services
 - Rigorously assess and analyze domestic manufacturing capabilities
 - Expand the inherent knowledge of each MEP Center's local manufacturing ecosystems
 - Build an integrated knowledge of U.S. supply networks
 - Work with OEMs to identify U.S. small and medium suppliers



**Mitigating supply
chain vulnerabilities**



Leveraging technology

Nine Technologies Transforming Industrial Production



The Industrial Internet
of Things



Cloud Computing



Cybersecurity



Automation



Robotics/
Cobots



Additive
Manufacturing



Augmented Reality
AR/VR



Simulation



Big Data/Artificial
Intelligence AI



Partnerships

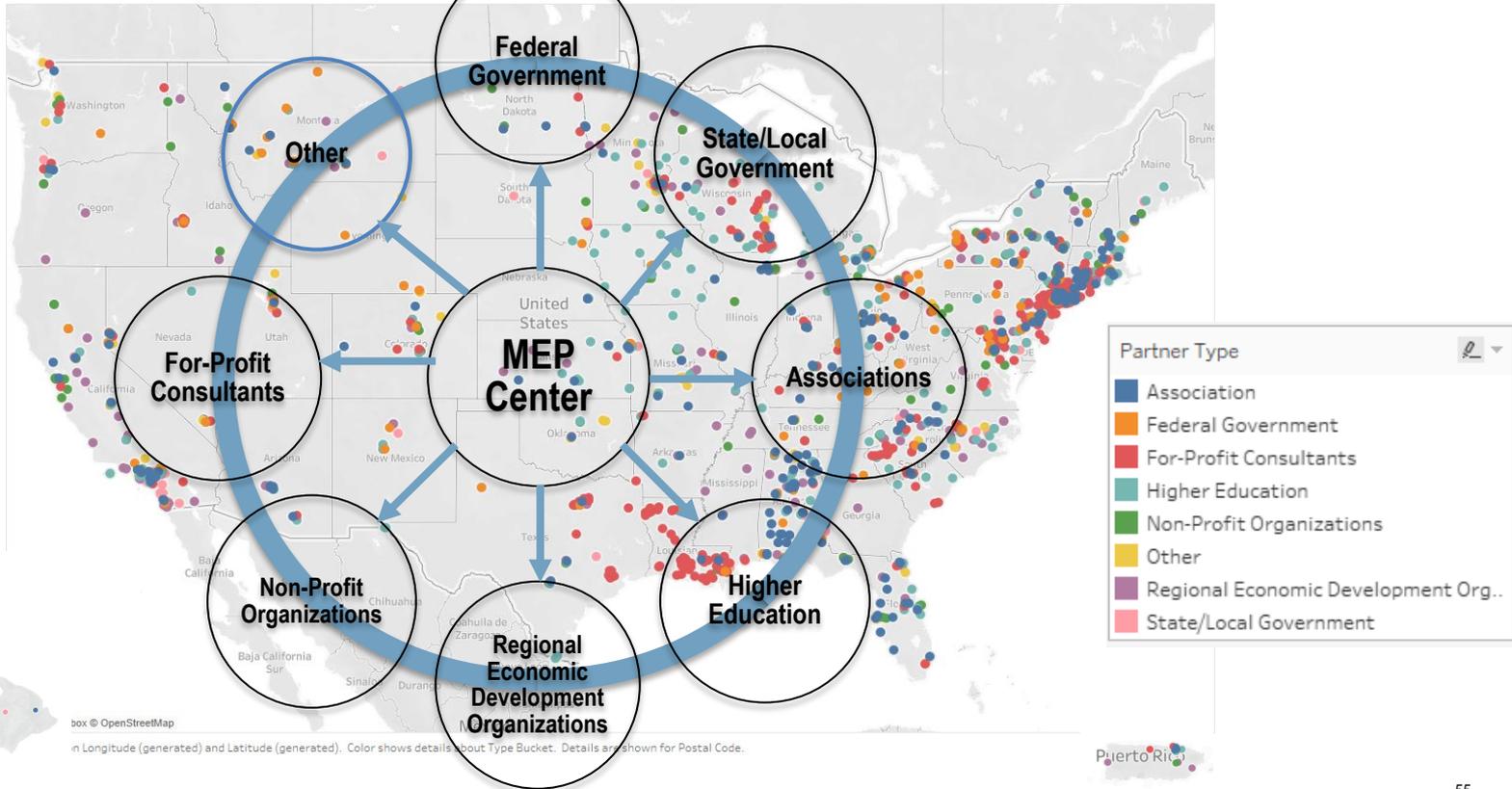


Collaborations



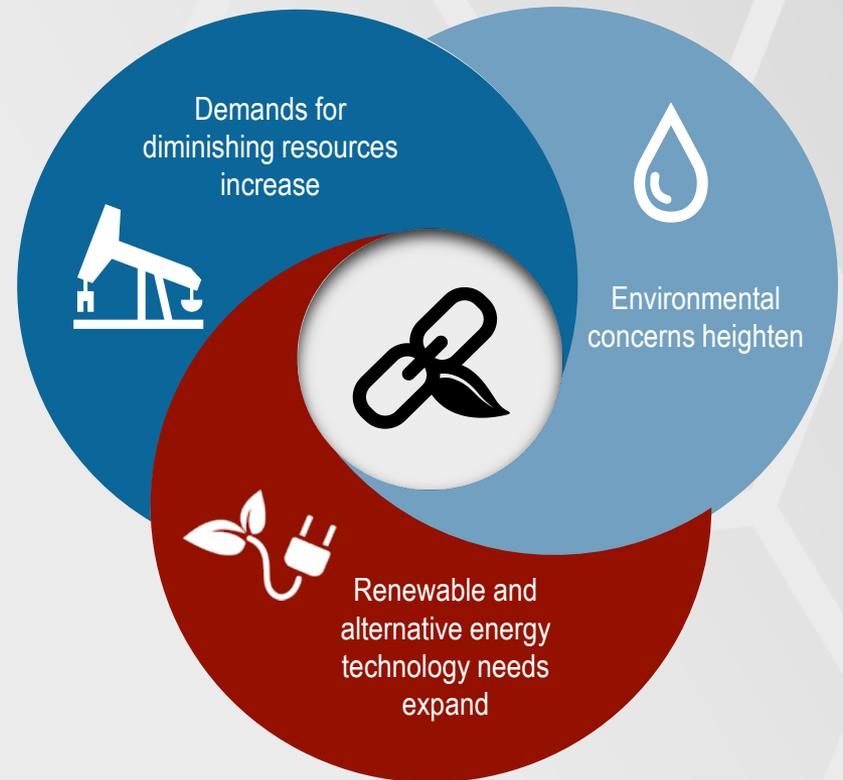
MEP Centers Connect Manufacturing Ecosystems

MEP National Network Partners by Type and Zip Code





Sustainability





Sustainability Proposition



Cost Savings

- Significant cost savings result from increased process efficiencies and reduced waste
- Profitable sustainability practices



Increased Competitiveness

- State-of-the-art sustainable business practices
- Technical support to drive entry into new markets
- Job creation and retention

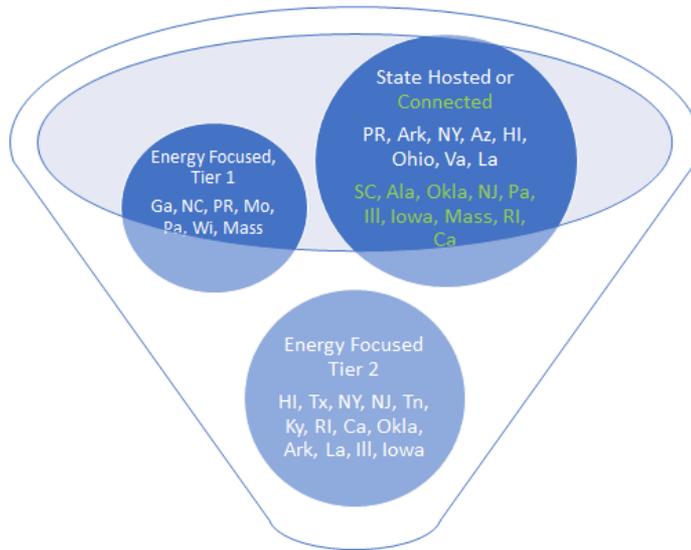


Access to Technical and Financial Resources

- Additional funding through federal and state programs
- Enhanced skills and capabilities for workers



DOE State Manufacturing Leadership Program RFA Awareness/Webinar Strategy



Energy + State, RFA Top Targets
PR, Ark, NY, HI, La, Okla, NJ, Pa, Ill, Iowa, Mass, RI

Secondary RFA Targets
Ga, NC, Mo, Wi, Tx, Tn, Ky,

NASEO WG

CA, CO, CT,
IN, KY, ME,
MI, MS, NY,
NC, PA, SC,
TN, UT, VA,
WA, WI





Network News

The Latest from the MEP National Network™

Informational Webinar: DOE State Manufacturing Leadership Program

Learn more about the recently announced Department of Energy (DOE) [State Manufacturing Leadership Program](#). Please plan to join a roundtable discussion for the MEP National Network and Manufacturing USA institutes with the DOE Office of [Manufacturing and Energy Supply Chains](#) (MESC). Through this program, DOE will invest up to \$50 million to work with states to accelerate use of smart manufacturing technologies and access by small and medium-sized manufacturers (SMMs) to high performance computing.

NIST is excited to have representatives from MESC join us to discuss this program and share ways that MEP Centers and Manufacturing USA institutes can be involved. Please join the conversation on **April 10 at 4 p.m. Eastern time** to learn more. Contact Jose Colucci-Rios at jac8@nist.gov or 202-281-5456 for more information and to attend.



Manufacturing Day: Oct. 6, 2023



Companies and educational institutions welcome students, parents, teachers and community leaders



Showcases modern manufacturing and the careers available



Hosts, coordinates and promotes events for this occasion



Credit: Fabricators and Manufacturers' Association



Proposed Partnership Opportunities/Collaborations (Local and National)

- **Clean Energy Awareness Campaigns**
 - HBCU/HSI/Tribal Colleges
 - Small and Medium Manufacturers sector
 - Manufacturing Day
- **Clean Energy Ecosystem Development**
 - Identify and Share Funding Opportunities
- **Build and/or Strengthen Strategic Alliances**
 - Federal Agencies
 - National Laboratories
 - Energy Focused Organizations
 - Professional Associations, NASEM
 - Manufacturing Institutes
 - CESMII, REMADE, IACMI, RAPID, Power America
- **Energy sector Supply Network Improvements**
 - Robustness, Resiliency, Optimization

NIST MEP hosted Roundtables

- Clean Energy – June 29th
- ESG – July 19th



Questions?



Connect with Us



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Visit Our Website

www.nist.gov/mep

Contact Us:

mfg@nist.gov

[301-975-5020](tel:301-975-5020)