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

- 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

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- Web resources and e-mail updates
  - Technical and business assistance programs
  - Funding and financial provisions (incl. IIJA/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.
  - 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)
  - EPIXC (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
NASEO State Industrial Working Group
https://www.naseo.org/naseo-state-industrial-working-group

- 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?

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](http://www.energystar.gov/plants)
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

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](http://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

• 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](http://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 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](http://www.energystar.gov/join)
Plants across the US participate in ENERGY STAR

*denotes certified and Challenge plants

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<td>Wyoming</td>
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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

- Raytheon Technologies
- Koch
- Merck
- Intertape Polymer Group
- Celanese
- Bimbo Bakeries USA
- Marathon
- General Motors
- CalPortland
- Ozinga
- Cemex
- Lockheed Martin
- Colgate-Palmolive Company
- Emerson
- Corning
- Nissan
- Hanes Brands Inc
- Abbvie
- Buzzi Unicem USA
- Constellium
- CPI
Study says: Energy efficiency can deliver over 1/3 of manufacturing’s CO₂ emission reductions in 2050

Worrell & Boyd, 2022

[Diagram showing energy efficiency components with Energy Efficiency-Reference at 27.8%, Material Efficiency-Retrofit at 10.4%, Material Efficiency-Rest of Manuf at 11.5%, Sector Specific-Renewables at 3.4%, Sector Specific-Hydrogen at 1.7%, Sector Specific-CCS at 8.6%, Grid Synergy-Zero C02 Grid at 17.7%, Grid Synergy-Electrification at 12.8%, Energy Efficiency-Incremental at 6.0%]
All industries have energy waste and a large opportunity for energy efficiency

Worrell & Boyd, 2022
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

https://www.nist.gov/mep/mep-national-network
NIST is Part of the US Department of Commerce

The Hollings Manufacturing Extension Partnership (MEP) is one of three extramural programs at NIST.
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.
PARTNERS

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

Approximately 430 Service Locations

NATIONAL NETWORK
One Center in Every State and Puerto Rico

Over 1,450 Manufacturing Experts

Nearly 2,100 Service Providers & Partners

Technology Transfer

Solving industry challenges together
MEP Centers Organizational Structure

501(c)(3) - 24
California
Colorado
Connecticut
Florida
Illinois
Kansas
Massachusetts
Maryland
Maine
Michigan
Minnesota
Missouri
North Dakota
New Hampshire
New Jersey
New Mexico
Oklahoma
Oregon
Pennsylvania
Puerto Rico
Rhode Island
South Carolina
Washington
Wisconsin

University - 18
Alaska
Delaware
Georgia
Iowa
Idaho
Indiana
Kentucky
Montana
North Carolina
Nebraska
Nevada
South Dakota
Tennessee
Texas
Utah
Vermont
West Virginia
Wyoming

State - 8
Alabama
Arkansas
Arizona
Hawaii
New York
Ohio MEP
Virginia
Louisiana

501(c)(6) - 1
Mississippi
Empowering Manufacturing:
2022 Impact Survey Results

Over 116,700 JOBS Created or Retained

$18.8 BILLION in New and Retained Sales
$6.4 BILLION Total New Investment in U.S. Manufacturing
$2.5 BILLION in Cost Savings

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

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<th>Year</th>
<th>Unique Clients Served with Training Services</th>
<th>Training Services Projects Completed</th>
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<tbody>
<tr>
<td>FY2020</td>
<td>4,718</td>
<td>7,953</td>
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<tr>
<td>FY2021</td>
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<tr>
<td>FY2022</td>
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Building Domestic Workforce
Strong focus on underserved communities and manufacturers

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<tr>
<th>Community</th>
<th>Centers Providing Services</th>
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<tbody>
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<td>Young professionals</td>
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<tr>
<td>Career-tech Students</td>
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<tr>
<td>Women</td>
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<tr>
<td>Veterans</td>
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<tr>
<td>High School Students</td>
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<tr>
<td>Community college students</td>
<td>31</td>
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<tr>
<td>Four-year college students</td>
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<tr>
<td>Displaced workers</td>
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<tr>
<td>Re-entry</td>
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<tr>
<td>New Americans / Recent immigrants</td>
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<tr>
<td>Middle School Students</td>
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<td>Opportunity Youth (ages 16-24, not in school)</td>
<td>12</td>
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<tr>
<td>Special needs</td>
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</table>
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
## Nine Technologies Transforming Industrial Production

1. **The Industrial Internet of Things**
2. **Cloud Computing**
3. **Cybersecurity**
4. **Automation**
5. **Robotics/Cobots**
6. **Additive Manufacturing**
7. **Augmented Reality (AR/VR)**
8. **Simulation**
9. **Big Data/Artificial Intelligence (AI)**

**Leveraging technology**
Partnerships

Collaborations
MEP Centers Connect Manufacturing Ecosystems

MEP National Network Partners by Type and Zip Code

- Federal Government
- State/Local Government
- Associations
- Other
- For-Profit Consultants
- Non-Profit Organizations
- Regional Economic Development Organizations
- Higher Education

Partner Type
- Association
- Federal Government
- For-Profit Consultants
- Higher Education
- Non-Profit Organizations
- Other
- Regional Economic Development Organizations
- State/Local Government
Sustainability

Demands for diminishing resources increase

Environmental concerns heighten

Renewable and alternative energy technology needs expand
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 Focused, Tier 1
Ga, NC, PR, Mo, Pa, WI, Mass

State Hosted or Connected
PR, Ark, NY, Az, HI, Ohio, Va, La
SC, Ala, Okla, NJ, Pa, Ill, Iowa, Mass, RI, Ca

Energy Focused, Tier 2
HI, Tx, NY, NJ, Tn, Ky, Ri, Ca, Okla, Ark, La, Ill, Iowa

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
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

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**NIST MEP hosted Roundtables**

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