Better Plants Workshop

Eli Levine
Program Manager, Better Plants

Better Buildings Summit
Welcome to the Better Buildings Summit!

Big things to know:
- Panels
- Networking
- Plenary Lunch
- Ask An Expert
- Trade Show
- Fun Run
Agenda

1. Better Plants Update
2. A View from the Advanced Manufacturing Office Director
3. Recognition:
   - Goal Achievers
   - 50001 Ready and SEP
   - Better Practice and Better Project Awardees
4. Program updates and a preview of 2019
5. Partner Feedback “Roundtable” Discussions
What do we hope you get out of this conference?

1. **Network!** Meet with your TAM and DOE staff, and more importantly, other BBBP partners

2. **Learn!** Hear partners share success stories and hear about DOE and Lab resources

3. **Be Recognized!** If you’re here, you care about reducing your energy footprint, and we want to celebrate you for your commitment

4. **Impact!** Your participation will shape the program’s future, and will influence your peers towards our shared environmental goals.
DOE Recognizes Better Plants Challenge Goal Achievers
Improved energy intensity by 25.6% cumulatively over nine years
Improved energy intensity by 20.3% cumulatively over five years (after meeting their first goal to improve energy intensity by 25% in 2014)
Improved energy intensity by 26.6% cumulatively over three years
DOE Recognizes Better Plants Program Goal Achievers
Improved energy intensity by 25.5% cumulatively over four years
Improved energy intensity by 27.69% cumulatively over two years
Improved energy intensity by 31% cumulatively over seven years
Better Plants Program Goal Achievers

**COMPLETE Design & Packaging**
- Improved energy intensity by 28% cumulatively over four years

**JM**
- Improved energy intensity by 29.8% cumulatively over five years

**LOCKHEED MARTIN**
- Improved energy intensity by 28.3% cumulatively over ten years

**thyssenkrupp**
- Improved energy intensity by 50.8% cumulatively over eight years
DOE Recognizes a Company for its 50001 Ready Facility
ArcelorMittal Cleveland
Recognized for instituting global best practices in continuous energy improvement across its facility in Cleveland, OH
DOE Recognizes Companies that have Achieved Superior Energy Performance Certification
Fleur Water Treatment Plant – Des Moines, IA
SEP Bronze Certified, 2017-2020
2.7% over one year
Facilities Certified to SEP

**Smyrna, TN Plant**
SEP Platinum Certified, 2018-2021
38.0% over ten years

**Columbia, SC Plant**
SEP Platinum Certified, 2017-2020
18.7% over three years

**Peru, IN Plant**
SEP Gold Certified, 2017-2020
23.2% over ten years

**Clovis, CA Plant**
SEP Platinum Certified, 2017-2020
20.4% over two years

**Cedar Rapids, IA Plant**
SEP Silver Certified, 2017-2020
7.3% over three years
Facilities Certified to SEP

Hagerstown, MD Plant
SEP Platinum Certified, 2017-2020
9.2% over three years
Better Plants Workshop

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Better Buildings Summit
Some of our New Program Partners Since 2017

Avon Lake Regional Water
Leggett & Platt

DIXLINE
FiAT CHRYSLER AUTOMOBILES

IMERYS Carbonates
plenco

Zimmer Biomet
Texas Nameplate Company
New Challenge Partners Since 2017

- PHARMAVITE
- Des Moines Water Works
- L’Oréal USA
- Cardington Yutaka Technologies Inc.
Goal Achievers Who Have Set a New Goal

Patriot Foundry & Castings

Owens Corning

P&G

Texas Instruments

thyssenkrupp
In-Plant Trainings
# In-Plant Trainings

<table>
<thead>
<tr>
<th>Host Plant Name / City, State</th>
<th>Location</th>
<th>Energy System Type</th>
<th>Dates</th>
</tr>
</thead>
<tbody>
<tr>
<td>Saint-Gobain</td>
<td>Norwood, MA</td>
<td>Treasure Hunt Exchange</td>
<td>Nov 11 - 14</td>
</tr>
<tr>
<td>3M Corporation</td>
<td>Maplewood, MN</td>
<td>50001 Ready</td>
<td>Mid-January</td>
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<tr>
<td>J.R. Simplot Company</td>
<td>Rock Springs, WY</td>
<td>Multi-system</td>
<td>Sept 24-27</td>
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<tr>
<td>City of Grand Rapids</td>
<td>Grand Rapids, MI</td>
<td>Pumps</td>
<td>Jan 15-17</td>
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<tr>
<td>Intertape Polymer Group</td>
<td>Blythewood, SC</td>
<td>Treasure Hunt Exchange</td>
<td>Aug 12 - Aug 14</td>
</tr>
<tr>
<td>Ingevity Corporation</td>
<td>DeRidder, LA</td>
<td>Multi-system</td>
<td>TBD</td>
</tr>
<tr>
<td>Schneider Electric</td>
<td>Foxboro, Mass</td>
<td>Steam</td>
<td>October 23-25</td>
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<tr>
<td>Cooper Standard</td>
<td>Bowling Green, OH</td>
<td>Compressed Air</td>
<td>Oct 23 - 25</td>
</tr>
<tr>
<td>KYB</td>
<td>Franklin, IN</td>
<td>Treasure Hunt Exchange</td>
<td>Sep 30 - Oct 2</td>
</tr>
</tbody>
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Technology Days
New and Improved Resources

• Technology-Focused Working Groups
• Better Buildings Financing Navigator 2.0
• Updated and Integrated Tool Suite
• Diagnostic Equipment Program
• 50001 Ready – new In Plant Training topic and dedicated resources
• Industrial Assessment Centers
New Resources for Partners

• New, Updated, Revamped Website
• Technology Pages
• Technology Tip Cards
• In-Plant Training Webinars
• ManufacturingUSA Two-Pagers
Proud to be a Better Plants Partner since 2013

We have pledged to improve our energy performance by 25%

Proud to be a Better Plants Challenge Partner since 2014

We have improved our energy performance by 25% and pledged to improve it by an additional 25%

Learn more at ENERGY.GOV/BETTERPLANTS
National Recognition

power couple
A BETTER PLANTS SUCCESS STORY

nominations due Monday April 30th!
NAM Sustainability in Manufacturing Partnership

DOE’s Better Plants is proud to be working with the National Association of Manufacturers on the Sustainability in Manufacturing partnership.
So, what more can Better Plants do for you?

How can we continue to grow the program?
Better Plants Ideas for 2019

Technical Resources

• New In-Plant Training Topics
• R&D Technology Working Groups
• BP Connections and Mentoring Program
• Treasure Hunt Exchange Expansion
• Treasure Hunt Exchange Toolkit
• Supply chain program expansion
• Small to medium manufacturers quick start guide to energy efficiency
• Energy-Intense Manufacturers program
• Stronger connections to complementary programs
• Partner Road Mapping Protocol
Better Plants Ideas for 2019

R&D Field Validation
- Technology Days 2019
- R&D Lab Connection Program
- Better Plants Lab Engagement Website
- More engagement with MfgUSA Institutes

Communications and Promotion
- Videos
- Articles
- Speaking Opportunities
- Regional Summits
DOE Recognizes 2018 Better Practice Award Winners

Recognizing outstanding accomplishments in implementing and promoting the practices, principles, and procedures of energy management in industry
For creating a virtual “USA Energy Management Toolbox” composed of technical best practices, a database of replicable, quick-win projects, and more
For developing a sophisticated Energy Assessment Matrix to measure and track the strength and continuous improvement of energy management systems
2018 Better Practice Award Winner

For forming a Green Team at its Waco, Texas, facility that helped double energy productivity, cut electricity costs by 70%, and standardize a method for tracking multiple key sustainability indicators.
For launching the Composites Solutions Business Energy Team Challenge with cash prizes to inspire competition between plant energy teams to reduce energy intensity
For deploying energy treasure hunts across the company, giving sites tools, guidance, and support for a largely “do-it-yourself” approach, with the 30 treasure hunts conducted since the program’s inception identifying $2.7 million in savings opportunities.
For initiating a baseload energy reduction program at its Merced, California, facility that reduced downtime baseload to less than 10%, avoiding an estimated $465,000 in energy costs
DOE Recognizes 2018 Better Project Award Winners

Recognizing outstanding accomplishments in implementing industrial energy efficiency projects at individual facilities
For implementing a building automation system upgrade at its Romulus, Michigan, facility encompassing plant floor lighting, energy metering, and floor HVAC, with an estimated payback of 1.5 years
For implementing a digester biogas generation & CHP project at its Hyperion Water Reclamation Plant to produce electricity and heat, reducing the plant’s energy intensity by 37% in two years.
For implementing the company’s first energy storage system at its Fullerton, California, facility, with an expected return on investment of over 500% through avoided utility peak demand costs
For piloting an advanced energy monitoring system with wireless submeters at its Soddy-Daisy, Tennessee, facility that has increased operational efficiency and inspired energy reduction projects yielding approximately $30,000 per year in energy cost savings.
For implementing a blending tank system requiring less pumping energy, less fresh water, and less cooling tower load at its Pocatello, Idaho, facility, resulting in $161,000 in annual energy savings.
For installing a 2.5 MW natural gas fired-combined heat and power system at its Gaithersburg, Maryland, facility, helping the site achieve 13.9% source energy savings over the previous year.
Better Plants R&D, Tools and Resources

Thomas Wenning, PE – ORNL

Better Buildings Summit 2018
Aug 22, 2018
R&D Connections
DOE has 21 National Laboratories and Facilities with Broad Expertise
Where do the National Laboratories fit?

Bridging the Valley of Death – The Role of Test Beds for Advanced Nuclear Reactors. Source: Todd Allen, Idaho National Laboratory, & Jessica Lovering, Breakthrough Institute.
There are a variety of mechanisms for working with the National Laboratories

- Cooperative Research and Development Agreements
- Strategic Partnership Projects
- Agreements for Commercializing Technologies
- Technology Licenses
- User Agreements
- Technology Assistance Programs
Some National Laboratory game changers

Nuclear power plants provided 10.9 percent of the world's electricity production in 2012. In 2014, 13 countries relied on nuclear energy to supply at least one-quarter of their total electricity.

Approximately 50 million nuclear medicine procedures are performed each year worldwide. BNL developed the Tc-99m generator and FDG.

Since the end of World War II, nuclear deterrence has been a cornerstone of the United States defense strategy.
National laboratories (SNL, LANL, LLNL, NETL) contributed to shale gas technology that significantly improved US energy independence.

National laboratories are drivers of new wind energy technologies.

Argonne National Lab’s battery cathode design powers the Chevy Volt.

The Ames Lab lead-free solder alloy is the world wide market leader.
Some National Laboratory game changers

Fermilab designed the first proton accelerator for cancer treatment.

PNNL millimeter wave airport screening devices enhance airport security. More than 1300 systems have been deployed worldwide.

ORNL was an early leader in the use of ion implantation for semiconductor processing and artificial joint surface treatment.
New Software Tool and Resources
Overview: Current AMO Software Tools

Energy Management & Performance Tracking
- 50001 Ready Navigator
- Automated Register of Implemented Actions
- PEP (Plant Energy Profiler)
- PWP (Plant Water Profiler)

Energy Footprint Tool
- EnPI and EnPI Lite Tools
  - Corporate Energy Performance Tracking for Better Plants partnership
  - Facility Energy Performance Tracking for Superior Energy Performance

Energy Systems Analysis
- Motors
- Pumps
- Fans
- Compressed Air
- Steam
- Process Heating
- Data Centers
- Simple Calculators
- Treasure Hunt Toolkit

www.energy.gov/eere/amo/software-tools
Project Objectives - Background

High-level Plant Energy & Savings Profile

**Process Heating/Steam Systems**  
60 – 80%

**Electric Motor Systems**  
8-15%

**Pumping Systems**  
7-15%

**Compressed Air Systems**  
2-7%

**Other***  
< 2%

* Other ancillary energy usages such as lighting represent less than 2% of energy consumption

**Potential Energy Saving Opportunities**

- 10% to 30%
- 5% to 10%
- 10% to 20%
- 10% to 20%
- 5% to 10%
MEASUR Software Tools

- Modernize to Open-Source Software!
  - DOE will own and control code
  - Upgrading tool capabilities where feasible
- Government-wide Open-Source Software
  - UT-Battelle Permissive License — “Do whatever, but please provide attribution”
- Desktop / Web / Mobile
- Enable Technology Field Validation
- Provide industry with technology/vendor agnostic analysis and evaluation tools
All system level software tools will be available to through **one platform**
- Includes system modelers and individual calculators for **field validation**
- Includes **built-in guides and tutorials**
Treasure Hunt Toolkit

**Key Aspects:**
- 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
Questions?

Thomas Wenning, PE
wenningtj@ornl.gov

Feedback & Comments?
Better Plants Update: Breakout Session

August 22, 2018
Format

- **Review general questions**
  - Answer each question on a separate piece of paper
- **Split into groups**
  - (Try not to sit with your work colleague!!)
- **Individual Group Brainstorming**
  - Designate group representative
  - Develop “short-list” of Best Practices
- **Closeout**
Individual Group Brainstorming

- Designate group representative
- Sift through ideas and develop a “short-list” of the best practices
  - Write these ideas on a separate piece of paper
Be thinking about:
- What has worked well in the past
- What has NOT worked well
- What are new things that can be (or are being) done
1) Engaging Employees and Cultural Change

- How are you engaging and communicating to employees/management?
- Strategies to drive cultural change at your company?
2) Major Energy Program Challenges

- What keeps you up at night in regards to your energy program?
- What are some the of biggest hurdles you regularly face?
3) Your Future Energy Program

- What is the “next big thing” for your energy program?
  - Internal initiatives?
  - New technologies?
  - Etc?
- My energy program would be World-Class if we did ___________
4) Workforce Issues & Shortages

- Is your company facing workforce issues?
- How to develop energy-savvy employees?
- What’s your next career step?
- Effective methods for backfilling / finding replacements?
5) Connecting R&D

- Is R&D on your radar?
- Role of R&D at your company and its impact on energy
- Can/how to leverage DOE’s R&D efforts to help your company?
6) Leveraging Better Plants

- What can the Better Plants do to help you drive efficiency in your organization?
- What can the program do to make your life easier!!
7) Better Plants New-Offerings Feedback

- Thoughts on the (possible) new Better Plants initiatives?
  - New INPLT Training Topics: industrial water efficiency, process cooling/chillers and cooling towers, etc
  - Improving/Utilizing DOE’s Software Tools
  - R&D Forum/Technology Working Groups
  - R&D Field Evaluations
  - BP Connections and Mentoring Program
  - Treasure Hunt Exchange Expansion
  - ....others??
Thank you!
Quick Wins

- What are some of your go-to quick-wins within your program (projects, engagement, etc)?
- What no-cost/low-cost actions are paying the biggest dividends?
- Best strategies for filling project pipeline?
- How are you encouraging implementation?