



Better Plants Workshop

Eli Levine
Program Manager, Better Plants

Better Buildings Summit

Welcome to the Better Buildings Summit!



U.S. DEPARTMENT OF ENERGY



**AUGUST 21-23
2018**
HUNTINGTON
CONVENTION CENTER
CLEVELAND, OH

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**

Better Buildings Summit 2018

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.



The State of Manufacturing

Rob Ivester
Director, Advanced Manufacturing
Office

Better Buildings Summit



Better Plants[®] CHALLENGE

U.S. DEPARTMENT OF ENERGY

*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



*Improved energy intensity by 28%
cumulatively over four years*



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



*Improved energy intensity by 28.3%
cumulatively over ten years*



*Improved energy intensity by 50.8%
cumulatively over eight years*



50001 Ready
U.S. DEPARTMENT OF ENERGY

***DOE Recognizes a Company for
its 50001 Ready Facility***



ArcelorMittal

ArcelorMittal Cleveland

Recognized for instituting global best practices in continuous energy improvement across its facility in Cleveland, OH



**Superior
Energy
Performance[®]**
U.S. DEPARTMENT OF ENERGY

***DOE Recognizes Companies that
have Achieved Superior Energy
Performance Certification***

Des Moines Water Works

Water You Can Trust for Life

*Fleur Water Treatment Plant –
Des Moines, IA
SEP Bronze Certified, 2017-2020
2.7% over one year*



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



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



Better Plants Workshop

Eli Levine
Program Manager, Better Plants

Better Buildings Summit

Some of our New Program Partners Since 2017



Avon Lake
Regional Water

Leggett & Platt[®]



DONSOCO[®]



FCA
FIAT CHRYSLER AUTOMOBILES



IMERYYS
Carbonates



PPC
Innovate. Connect.
A BELDEN BRAND



ZIMMER BIOMET
Your progress. Our promise.[®]



TEXAS
NAMEPLATE
COMPANY

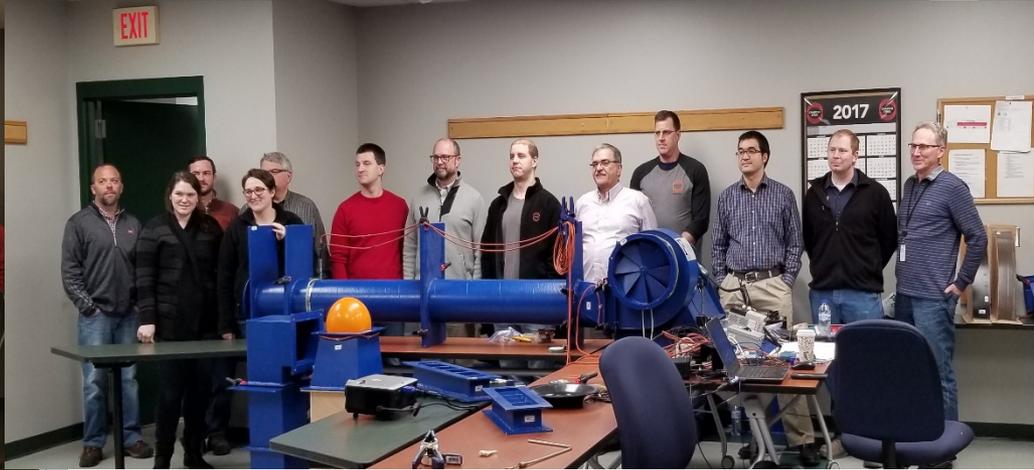
New Challenge Partners Since 2017



Goal Achievers Who Have Set a New Goal



In-Plant Trainings



In-Plant Trainings

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

Technology Days

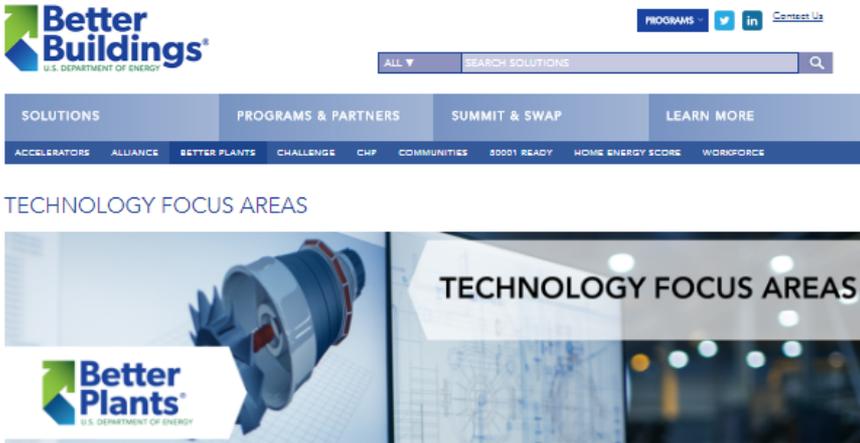


New and Improved Resources

- 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



The screenshot shows the Better Buildings website header with the logo and navigation menus. The main content area features a banner for 'TECHNOLOGY FOCUS AREAS' with the Better Plants logo and a 3D turbine model. Below the banner is a list of technology focus areas.

Better Buildings
U.S. DEPARTMENT OF ENERGY

PROGRAMS [Twitter](#) [LinkedIn](#) [Contact Us](#)

ALL ▾ SEARCH SOLUTIONS 🔍

SOLUTIONS PROGRAMS & PARTNERS SUMMIT & SWAP LEARN MORE

ACCELERATORS ALLIANCE BETTER PLANTS CHALLENGE CHP COMMUNITIES 5001 READY HOME ENERGY SCORE WORKFORCE

TECHNOLOGY FOCUS AREAS

Better Plants
U.S. DEPARTMENT OF ENERGY

Manufacturers and water and wastewater treatment agencies face many obstacles as they strive to improve energy efficiency in their facilities. The following individual technology focus area webpages are meant to be one-stop shops for those seeking actionable solutions for energy efficiency challenges involving specific systems. Each page contains links to helpful resources, such as relevant Better Plants showcase projects and implementation models, DOE tip sheets and publications, software tools, webinars, and contact information for a subject matter expert:

- [BUILDING ENVELOPE AND MODELING](#)
- [COMBINED HEAT AND POWER \(CHP\)](#)
- [COMPRESSED AIR](#)
- [FANS](#)
- [LIGHTING](#)
- [MOTORS](#)
- [PROCESS COOLING AND HVAC](#)
- [PROCESS HEATING](#)
- [PUMPS](#)
- [REFRIGERATION](#)
- [RENEWABLES, DISTRIBUTED GENERATION, AND MICROGRIDS](#)
- [STEAM](#)
- [WATER](#)

Facility Posters



PROUD TO BE A
BETTER PLANTS PARTNER
SINCE 2013

WE HAVE PLEDGED TO IMPROVE OUR
ENERGY PERFORMANCE BY 25%



LEARN MORE AT ENERGY.GOV/BETTERPLANTS

VOLVO

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



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

Better Plants Update

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

BREAK



DOE Recognizes 2018 Better Practice Award Winners

Recognizing outstanding accomplishments in implementing and promoting the practices, principles, and procedures of energy management in industry



ArcelorMittal

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



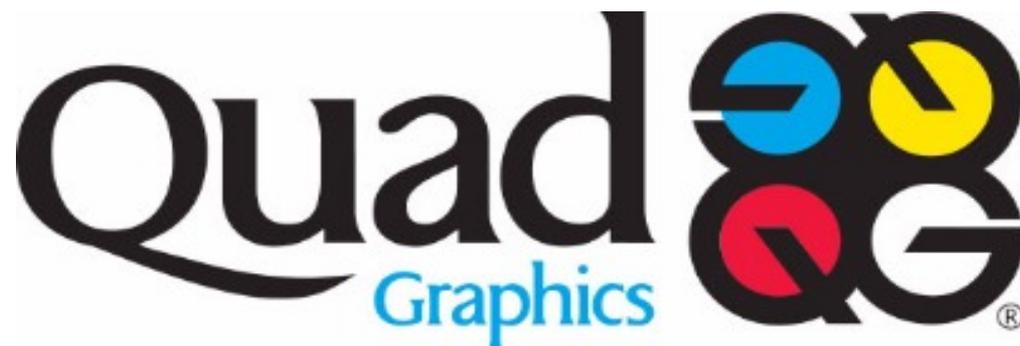
For forming a Green Team at its Waco, Texas, facility that helped double energy productivity, cut electricity costs by 70%, and standardize a method for tracking multiple key sustainability indicators



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

Raytheon

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

MedImmune

A member of the AstraZeneca Group

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



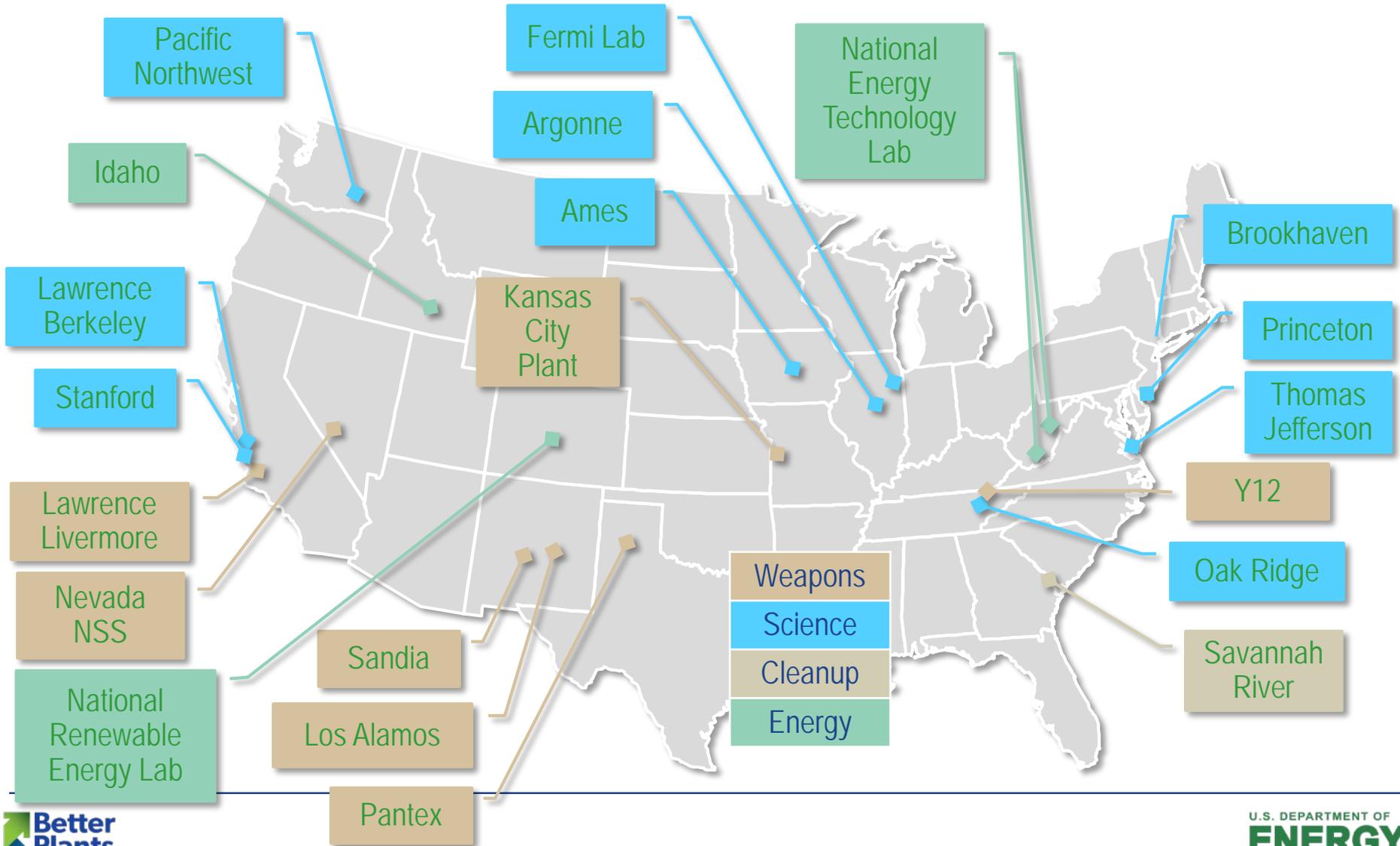
Better Plants R&D, Tools and Resources

Thomas Wenning, PE – ORNL

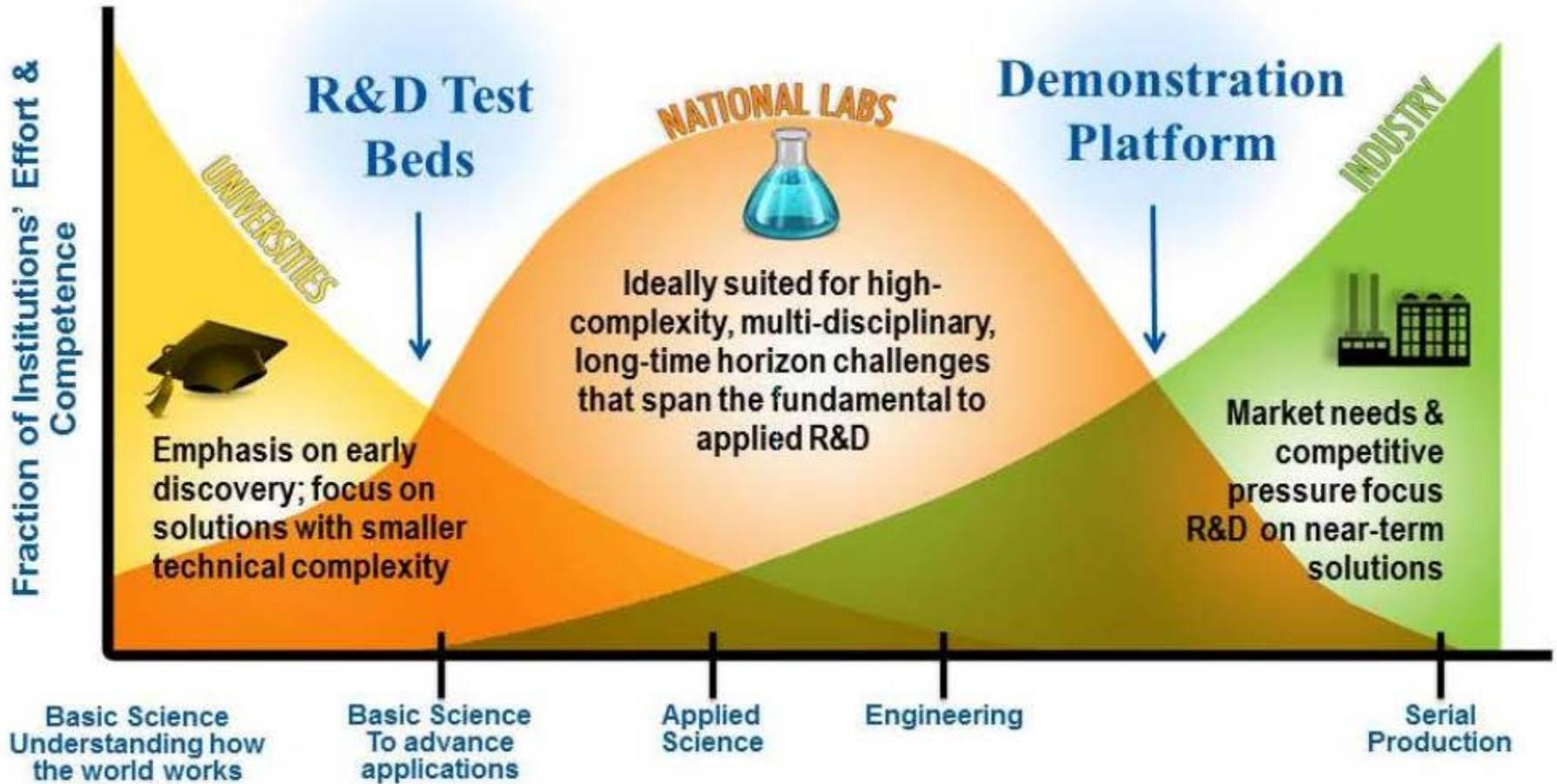
Better Buildings Summit 2018
Aug 22, 2018

R&D Connections

DOE has 21 National Laboratories and Facilities with Broad Expertise



Where do the National Laboratories fit?



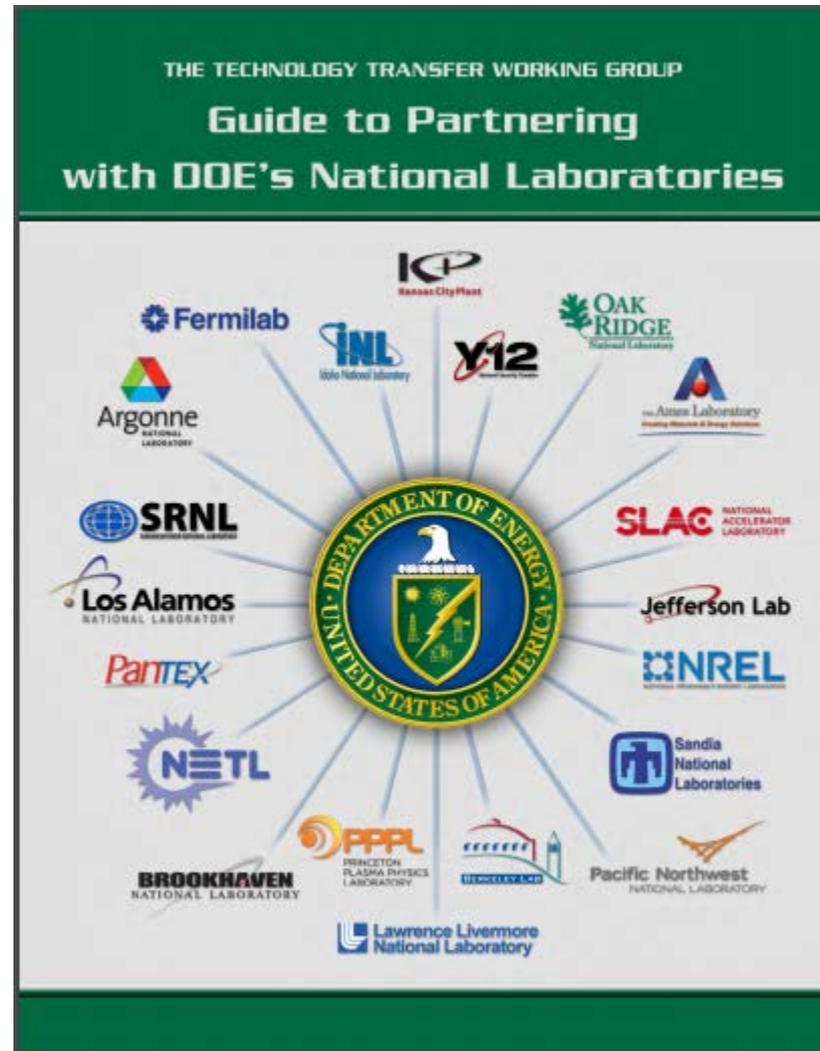
Bridging the Valley of Death – The Role of Test Beds for Advanced Nuclear Reactors. Source: Todd Allen, Idaho National Laboratory, & Jessica Lovering, Breakthrough Institute.

There are a variety of mechanisms for working with the National Laboratories

Cooperative
Research
and
Development
Agreements

Strategic
Partnership
Projects

Agreements
for
Commercializ
ing
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.

Some National Laboratory game changers

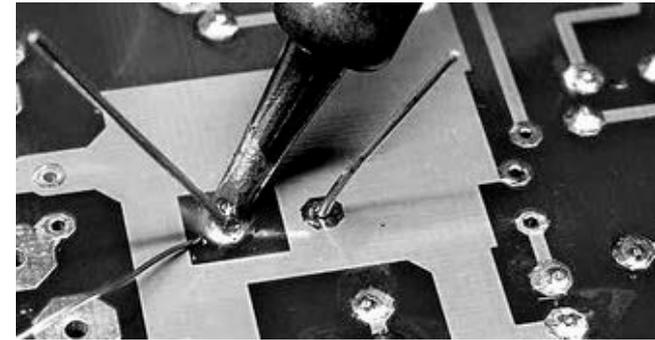


National laboratories (SNL, LANL, LLNL, NETL) contributed to shale gas technology that significantly improved US energy independence.

National laboratories are drivers of new wind energy technologies.

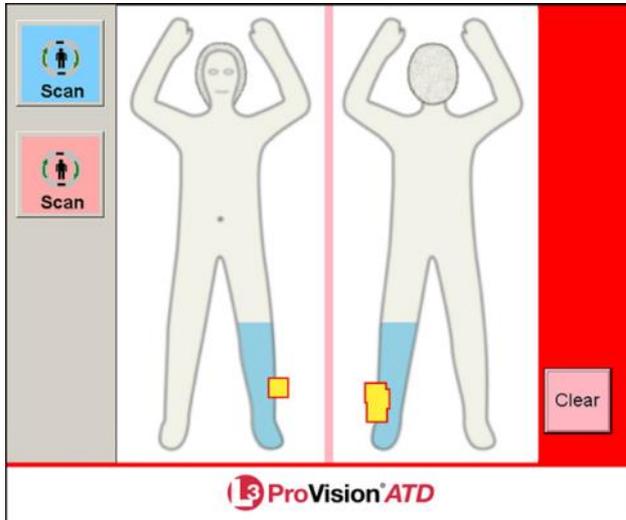


Argonne National Lab's battery cathode design powers the Chevy Volt.



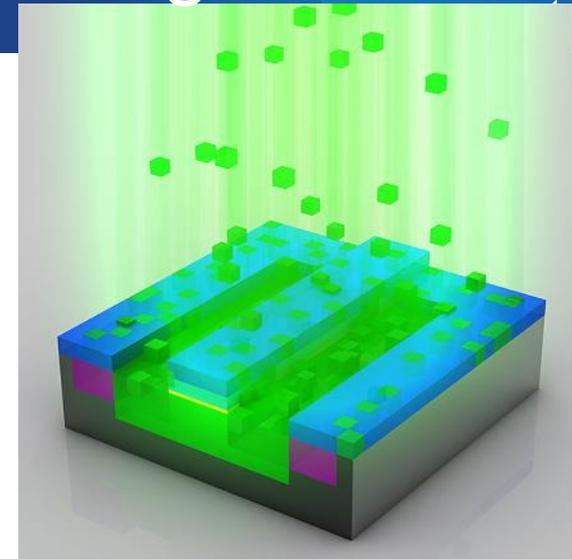
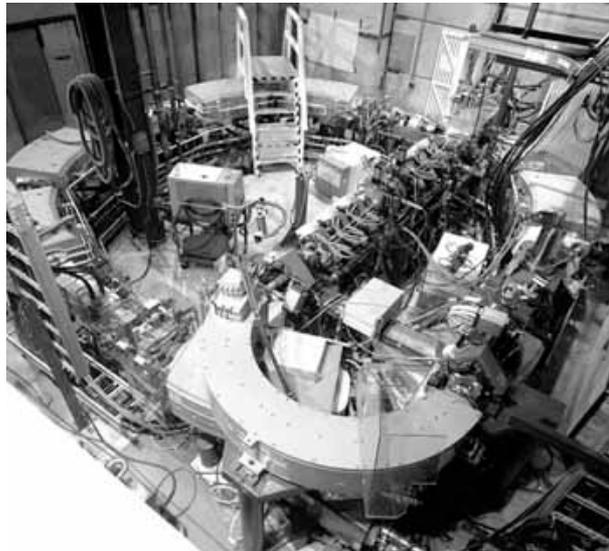
The Ames Lab lead-free solder alloy is the world wide market leader

Some National Laboratory game changers



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

Fermilab designed the first proton accelerator for cancer treatment.



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

Energy Footprint Tool

Automated Register of Implemented Actions

EnPI and EnPI Lite Tools

PEP (Plant Energy Profiler)

Corporate Energy Performance Tracking for Better Plants partnership

PWP (Plant Water Profiler)

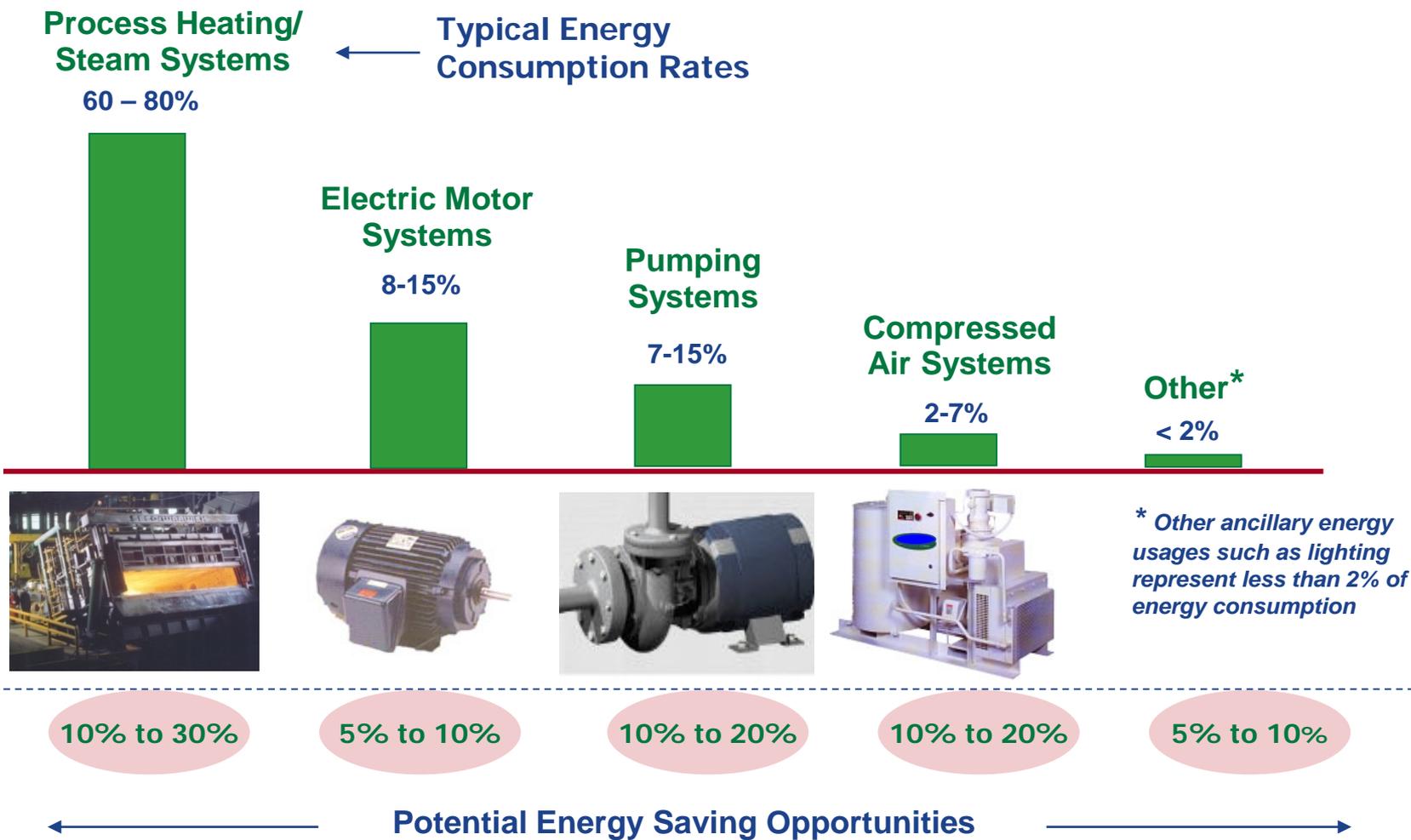
Facility Energy Performance Tracking for Superior Energy Performance

Energy Systems Analysis

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

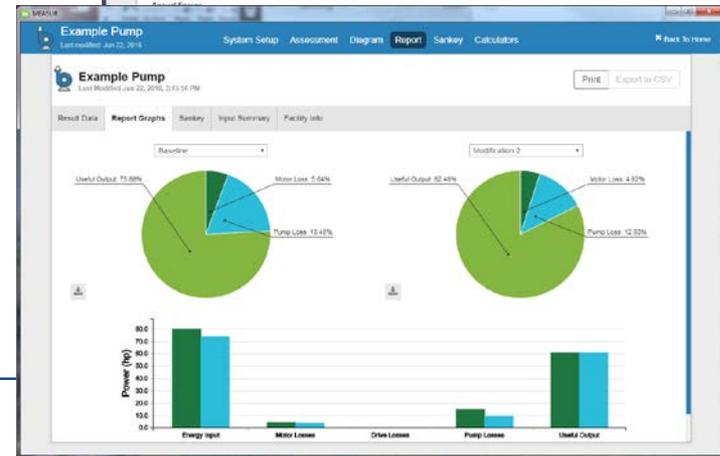
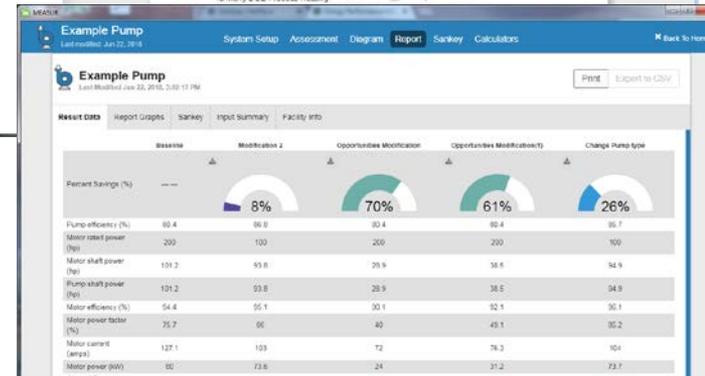
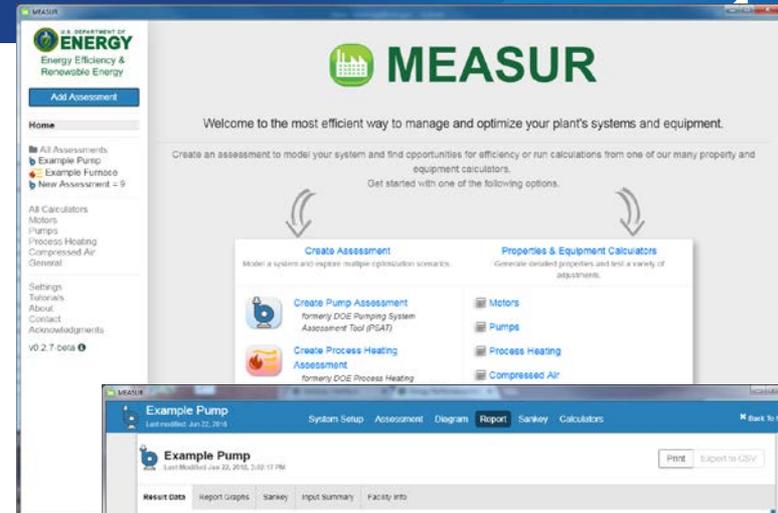
Project Objectives - Background

High-level Plant Energy & Savings Profile



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**



Integrated Energy Tool - MEASUR



U.S. DEPARTMENT OF ENERGY
Energy Efficiency & Renewable Energy

MEASUR

Welcome to the most efficient way to manage and optimize your plant's systems and equipment.

Create an assessment to model your system and find opportunities for efficiency or run calculations from one of our many property and equipment calculators.
Get started with one of the following options.

Create Assessment
Model a system and explore multiple optimization scenarios.

- Create Pump Assessment**
formerly DOE Pumping System Assessment Tool (PSAT)
- Create Process Heating Assessment**
formerly DOE Process Heating Assessment and Survey Tool (PHAST)
- Create Fan Assessment**
formerly DOE Fan System Assessment Tool (FSAT)

[View All Your Assessments](#)

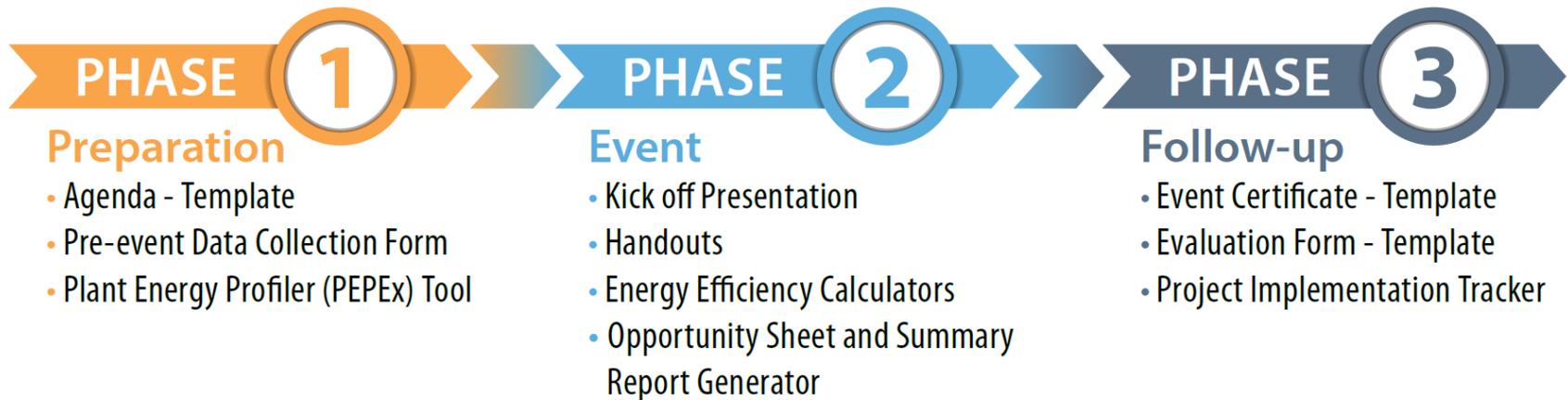
Properties & Equipment Calculators
Generate detailed properties and test a variety of adjustments.

- Motors
- Pumps
- Fans
- Process Heating
- Steam
- Compressed Air
- General

U.S. DEPARTMENT OF ENERGY | Energy Efficiency & Renewable Energy

- All system level software tools will be available to through **one platform**
- Includes system modelers and individual calculators for **field validation**

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?

Feedback & Comments?

Thomas Wenning, PE
wenningtj@ornl.gov



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

General

- 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 of the 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 it's 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?