



Advanced Manufacturing Office Program Review

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Better Buildings, Better Plants

- Through Better Plants:
 - Companies set long-term efficiency goals (25% energy intensity over 10 years)
 - Receive technical assistance and national recognition for their leadership
- Manufacturers have two opportunities to engage in Better Plants:
 1. Broader-based *Program*
 2. Higher-level *Challenge*



Voluntary, Public – Private Partnerships

Why Join Better Plants?

Technical Partnerships

- Assigned **Technical Account Manager**, to help navigating the program, collecting with data collection/reporting, and tapping into energy-saving resources
- **In-Plant Trainings**: system-specific workshops led by Better Plants experts that train participants on how to identify, implement, and replicate energy-saving projects.
- **Access** to Industrial Assessment Centers/CHP TAPs/Water Efficiency Pilot
- **Supply Chain Engagement**: help partner suppliers leverage resources and collectively set, track, and meet energy savings goals.
- **Diagnostic Equipment Program**: access to instruments to measure energy consumption, for free.



Process heating INPLT at an ArcelorMittal plant in Nov. 2013.

National Recognition

- **Awards** for Goal Achievers, Better Practice, Better Project
- **Better Buildings Solution Center**: Case studies and success profiles

Peer-to-Peer Networking Opportunities

Productivity. Cost Savings. Competitiveness.



Better Plants Year in Review

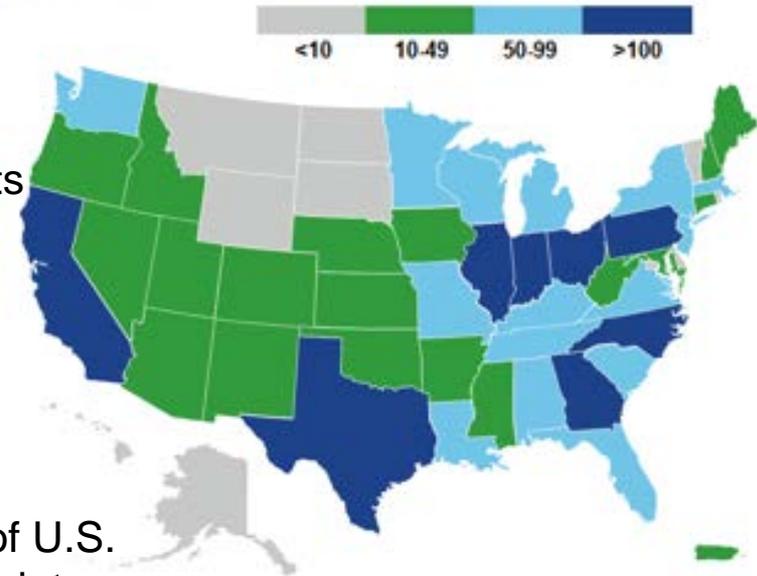
190+

Better Plants partners,
across all 50 states

\$3.1B

Cumulative Better Plants
dollars saved

Regional Distribution of Better Plants Facilities



15

Goal-achieving partners who
have 'doubled-down' on success

12%

Better Plants percent of U.S.
manufacturing footprint

1,000

Partner solutions in the
Solutions Center

33

New partners
Our biggest year since inception!

2,600

Number of facilities

Better Plants Challenge



Some of our New Partners in 2016

L'ORÉAL
USA

 **CIA&D**
CO-OPERATIVE INDUSTRIES
AEROSPACE & DEFENSE



SAVAGE[®]
precision fabrication, inc.



Vermeer




 **MAC** Mulgrew Aircraft Components, Inc.

 **CLEARWATER ENGINEERING**
AEROSPACE MACHINE & TOOL

Des Moines
Water Works
Water You Can Trust for Life



 **Jedco**
QUALITY AEROSPACE COMPONENTS

CITY OF
ROSEVILLE
CALIFORNIA

 **HONDA**
The Power of Dreams



 **VANGUARD**
SPACE TECHNOLOGIES

 **REO**
precision optical solutions

 **Armstrong**



 **MITSUBA**
American MITSUBA Corporation

 **NEWMAN**
TECHNOLOGY, INC.



MAHLE
Driven by performance

 **Bristol-Myers Squibb**



 **B** 
BATH ELECTRIC, GAS & WATER SYSTEMS

 **City of Phoenix**

 **ENCINA**
WASTEWATER
AUTHORITY

 **ENVIRONMENTAL**
SERVICES

 **Martin & Co.**
EST. 1833



 **IR** **Ingersoll Rand**

NEW Water
The brand of the Green Bay
Metropolitan Sewerage District

 **Better Plants**
U.S. DEPARTMENT OF ENERGY

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U.S. DEPARTMENT OF
ENERGY

In-Plant Trainings

- Teach participants how to conduct assessments, use DOE tools, and implement projects
- Open to employees from host plant, peer companies, suppliers
- ~70 INPLTs provided for ~1000 participants
- Identified > 3 TBTU and \$14 million in energy savings
- Pre-INPLT webinars available on program website

In-Plant Topics Offered:

- Compressed air;
- Fans;
- Motor-driven systems;
- Pumps;
- Steam;
- Energy treasure hunt exchange
- Refrigeration (new);
- Water/wastewater systems (new)
- ISO 50001 (new)



In-Plant Trainings 2017

Host Plant Name / City, State	Location	Energy System Type	Dates
Kent County Regional Resource Facility	Milford, DE	Water/Wastewater	July 11-13
City of Phoenix Water Services Department	Phoenix, AZ	Water/Wastewater	April 25-28
Nissan	Canton, MS	Compressed Air	April 18-20
Saint-Gobain	Semora, NC	Compressed Air	June 6-8
Ingevity Corporation	Wickliffe, KY	Process Heating	May 22-24
Orange County Water and Sewer Authority	Chapel Hill, NC	Water/Wastewater	May 1-4
Electrolux	Memphis, TN	Process Heating	March 7-9
Legrand North America	Fairfield, NJ	Treasure Hunt Exchange	April 23-25
Novelis	Oswego, NY	Compressed Air	May 9-12
Tenaris Hickman	Blytheville, AR	Compressed Air	Feb 22-24
Encina Wastewater Authority	Carlsbad, CA	Pumps/Fans	TBD

Newly Awarded Inplant Trainings:

Abbvie – Strategic Energy Management

J.R. Simplot – Industrial Refrigeration

Pima County – Water/Wastewater

Volvo Trucks – Treasure Hunt Exchange

Grand Rapids WRR –Water/Wastewater

United Technologies Aerospace Systems – Compressed Air

Supply Chain Initiative

- 4 Better Plants partners are working with 30 suppliers to set energy-saving goals and track progress
- Suppliers receive DOE technical support, including priority access to free energy audits

Legrand	UTC	Lockheed Martin	Honda NA
Chapco	GKN Aerospace	Cascade Engineering Technologies, Inc.	KYB Americas
Coilplus	Hitchiner	Clearwater Engineering, Inc.	Newman Technologies
Complete Design & Packaging	MB Aerospace	Cooperative Industries Aerospace & Defense	Asama Coldwater Manufacturing
Durex	RTI International Metals, Inc.	The Harva Company, Inc.	American Mitsuba
Lynam	Selmet, Inc.	Research Electro-Optics	NSK Americas
Magnetic Metals	Weber Metals, Inc.	Savage Precision Fabrication	Mahle Engine Components
Rowley Spring & Stamping	Jedco, Inc.	Vanguard Space Technologies	Cardington Yutaka
Stanley Spring & Stamping		Tri-State Plastics, Inc.	

Water/Wastewater Treatment Sector

- DOE working with water and wastewater sector to understand key challenges, refine metrics, and share solutions
- Together, these represent millions of gallons per day of water



Better Plants Water & Wastewater Treatment Agency Partners

Alexandria Renew Enterprises	Los Angeles Department of Water & Power
Bath Electric Gas & Water	MWRA (Boston)
City of Phoenix Water	Orange Water & Sewer Authority
Bucks County Water & Sewer Authority	Narragansett Bay Commission
Delta Diablo	New York City Department of Environmental Protection
Encina Wastewater Authority	Pima County Regional Wastewater Reclamation Department
Ithaca Area Wastewater Treatment Facility	St. Petersburg Water Resources Department
Kent County, DE	Victor Valley Wastewater Reclamation Authority
Los Angeles Bureau of Sanitation	Western Lakes Superior Sanitary District
Des Moines Water Works	Grand Rapids Water Resource Recovery Facility
Charleston (SC) Water	Philadelphia Water

Water Efficiency Pilot Initiative

- DOE is working with 38 Better Buildings Challenge Partners in this effort
- Format of initiative similar to Better Plants Challenge:
 - Set water savings goals
 - Track progress
 - Publicly share success (Showcase & IM)
- 9 Better Plants Partners participating
- Extra Recognition for partners that join

Company	Baseline Year	Total Improvement (through 2015)
<i>*Cummins</i>	2010	45%
Ford	2009	44%
GM	2010	19%
☀HARBEC	-	49%
Nissan	2013	13%
Saint-Gobain	2012	Pending
Toyota	2014	Pending
<i>*UTC</i>	2006	43%
BD	TBD	-

☀Set goal to be water neutral

*2016 goal achiever

Field Validation & Diagnostic Equipment Program

Helping Better Plants Partners measure operating data to evaluate equipment performance and quantify energy performance improvement



- Free of charge, including shipping
- Use equipment for one day, or up to four weeks
- Limited technical assistance to help w/ selection and use of tools
- First come, first serve application

Advanced Technology Partnerships

Better Plants Partners were invited down to ORNL to:

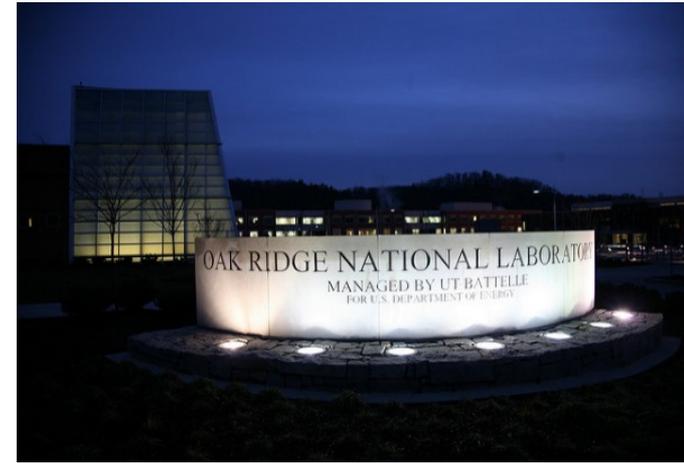
Tour World-Class Lab Facilities

View Demonstrations of innovative Technologies

Hear from Experts from the Lab and Industry

Learn how to easily partner and leverage technology

Network with BP partners and lab technologists



IAC Internship Program



Opportunities to hire IAC students:

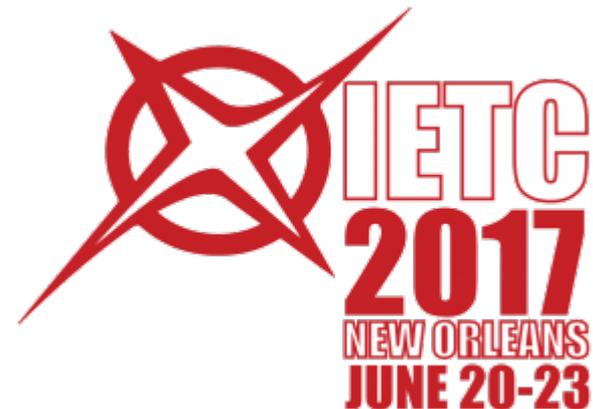
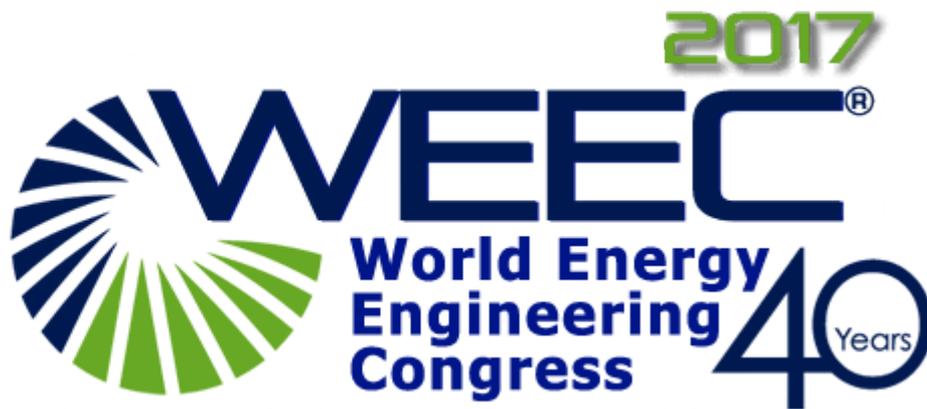
Jobs Internships

- IAC Alumni graduate w/ an avg of 8.9 specific, applicable skills in energy efficiency
- IAC Alumni have a skill mix worth \$6,210 more than their peers
- IAC Alumni are hired almost 2x as fast as peers into energy efficiency job

<https://betterbuildingsolutioncenter.energy.gov/better-plants/activity/iac-job-forum>

Networking Opportunities

BETTER BUILDINGS SUMMIT



Better Buildings Solutions Center

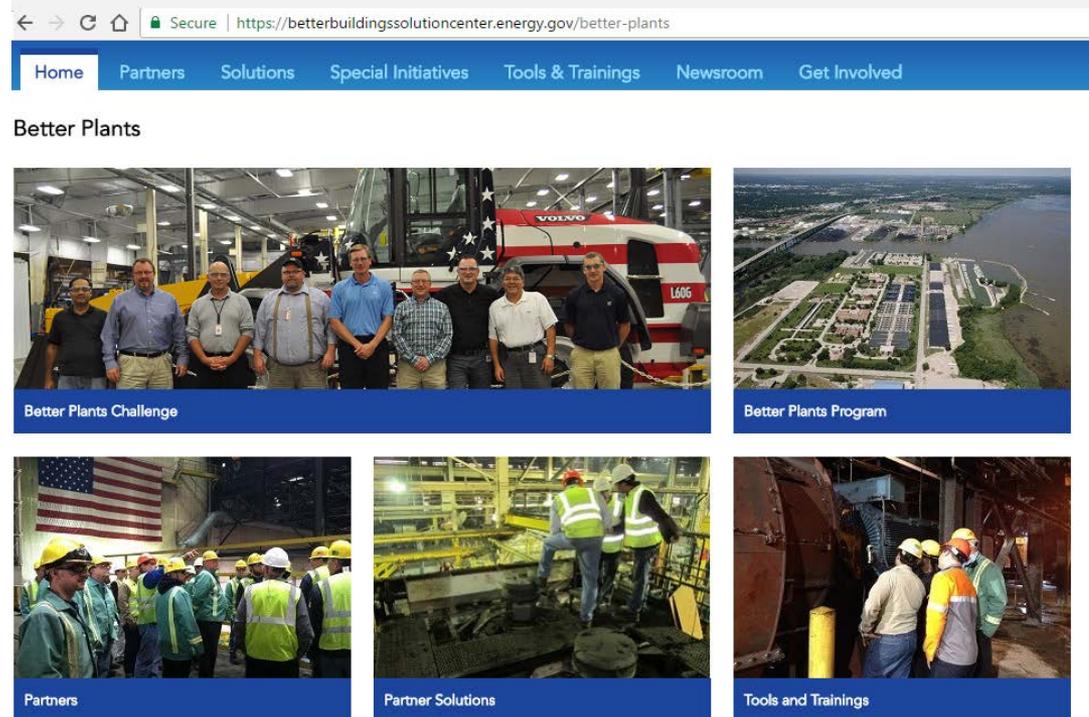
200+ showcase projects

- Large and small buildings
- All sectors
- Specific building types such as schools, hospitals, hotels, grocery stores, universities, civic centers, libraries, offices and labs

100+ implementation models (playbooks)

- Overcome barriers: finance, data, energy management, staff training, community and customer outreach, partnering with utilities, and more
- Multi-faceted and applicable across sectors

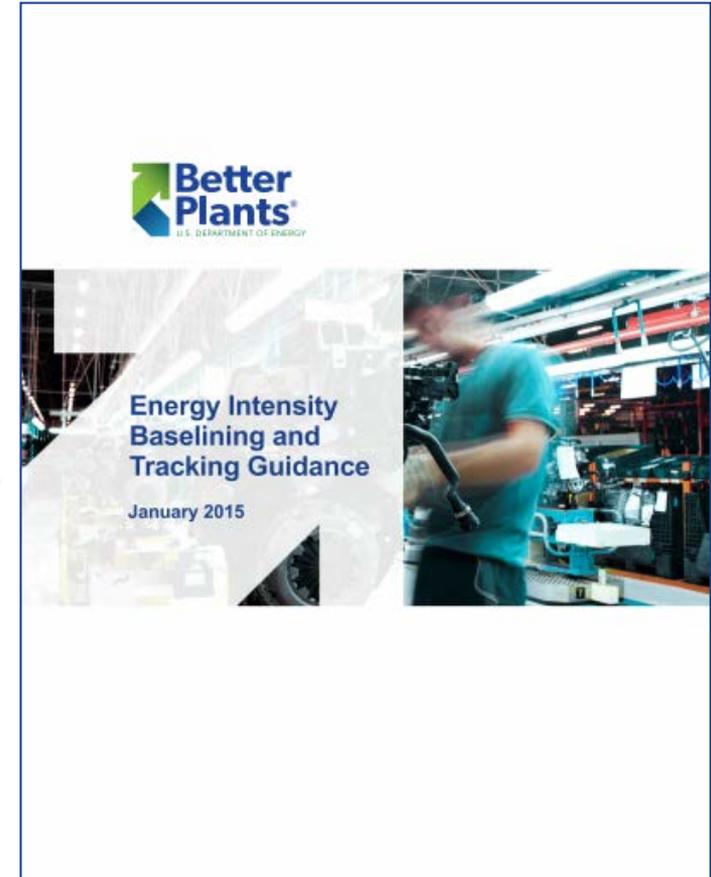
1,000 case studies, reports, calculators and more



- Nearly 200 industrial solutions tested and proven by Partners – 100 added in 2016
- Find solutions by topic, building type, solution type, building size, sector, technology, location, and more.

Publications, Papers and Resources

- Developing a Corporate Water Management Strategy for Manufacturers
- The Implementation of ISO 50001 and SEP in Water and Wastewater Treatment agencies
- Chemical Processing Magazine: Engaging Operations in Energy Optimization (January 2017)
- Compressed Air Best Practices Magazine: Innovative Energy Program Assessments at Darigold (April 2016)



Complementary Resources



50001 Ready
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Energy
Performance**
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