



BETTER PLANTS

U.S. Department of Energy

Better Buildings, Better Plants

- **What is Better Plants?** A free, voluntary partnership program for **manufacturers** and industrial organizations that want to save on energy costs
- Through Better Plants:
 - Partners set long-term efficiency goals
 - Receive **technical assistance, networking platforms, national recognition and access to R&D**
- Manufacturers have two opportunities to engage in Better Plants:
 1. Broader-based **Program** level
 2. Higher-level **Challenge**



Productivity. Cost Savings. Competitiveness.

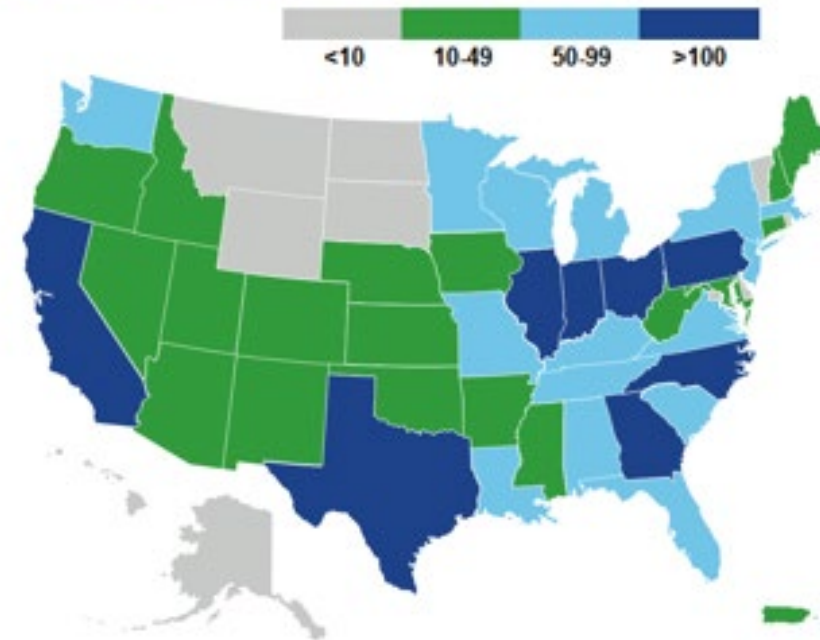
Better Plants Overview

Energy savings and program footprint continue to grow

Better Plants Snapshot

Accomplishments	Total
Number of Partners	235+
Approximate Number of Plants	3,200+
Percent of U.S. Manufacturing Energy Footprint	12%
Reported Savings	
Cumulative Energy Savings (QBtu)	1.7
Cumulative Cost Savings (Billions)	\$8.2
Cumulative Avoided CO ₂ Emissions (Million Metric Ton)	61.5
Average Annual Energy Intensity Improvement Rate	2.5%

Regional Distribution of Better Plants Facilities



67 goal achievers total, 4 this year!

Better Plants Challenge Partners



Why Partner with Better Plants?

Free Technical Assistance

- **Technical Account Manager:** Free resource to help navigate program resources & save time
- **In-Plant Trainings:** Performed by national expert instructors
- **Resources:** Diagnostic & Software Tools/Industrial Assessment Centers/CHP TAPs/Water Savings tools, 50001 Ready
- **Supply Chain Engagement:** resources for suppliers



National Recognition

- **Awards** for Goal Achievers
- **Better Project/Better Practice Awards**

Peer-to-Peer Networking Opportunities

Access to DOE and National Lab R&D

Cummins' green initiative takes root
Nov 5, 2014, 12:26pm EST

✉ [Twitter](#) [LinkedIn](#) [Facebook](#) [Google+](#) [Save](#) [Order Reprints](#) [Print](#)

 **David Bertola**
Buffalo Business First Reporter-
Buffalo Business First
Email | [Twitter](#) | [Google+](#)

The U.S. Department of Energy is recognizing the Cummins Inc. Jamestown engine plant as a showcase project for its Better Buildings Better Plants Challenge.

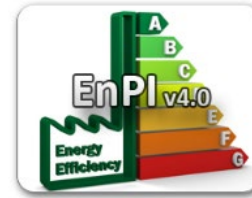
[Enlarge Photo](#)

According to the Department of Energy's [A Cummins engine at the Jamestown plant. \(file photo\)](#)



Technical Support: Technical Account Manager (TAM)

- Help with energy baselines and data tracking/reporting
 - EnPI regression-based tool
- Keeps partners informed about all available DOE resources
- Helps partners develop a roadmap for achieving their goal(s)



TAM helping partner use EnPI tool at an INPLT training

“Like having a free consultant on retainer” Andy Terrey, City of Phoenix Water Services

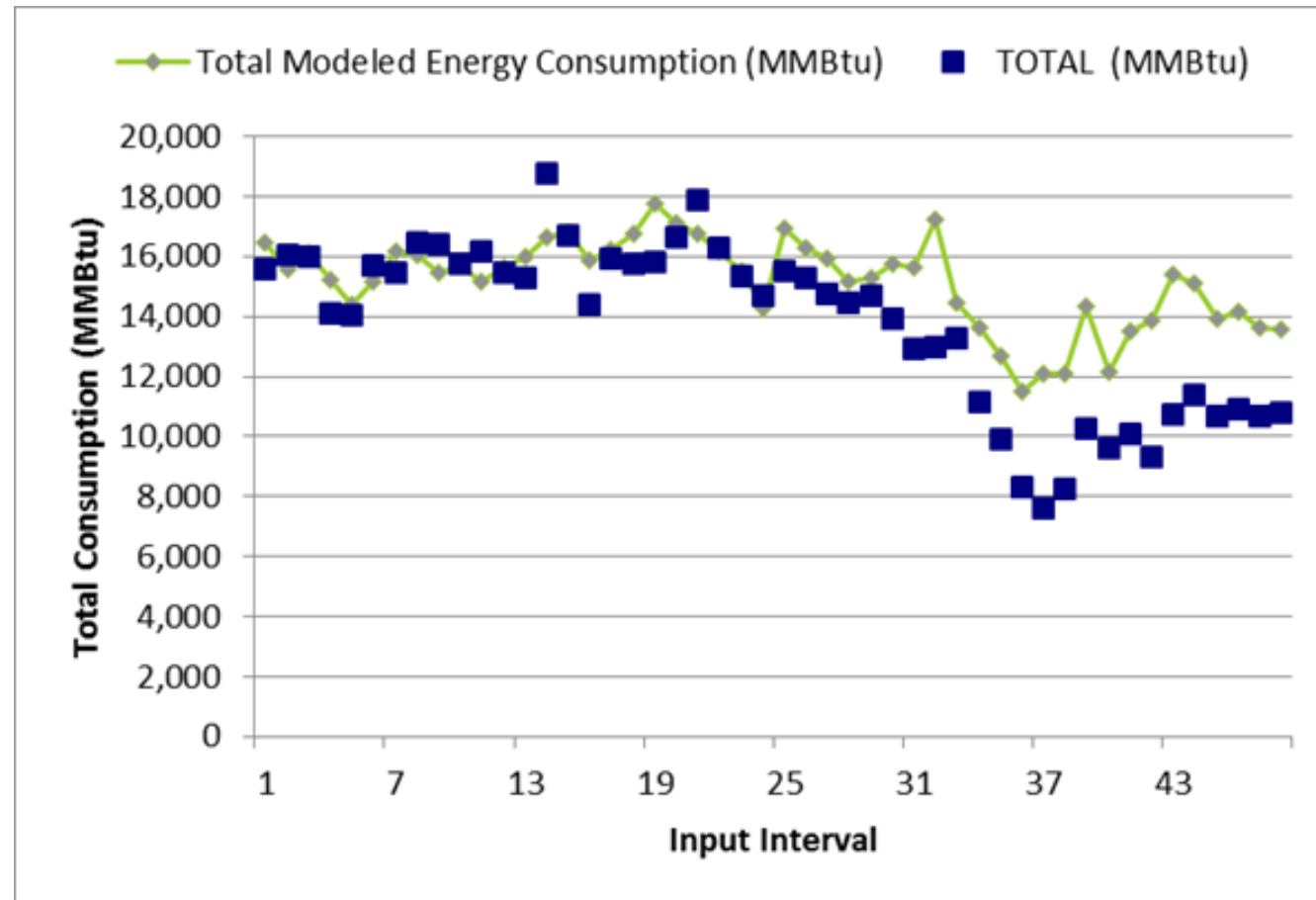
EnPI Tool Example

Model Output

	2014	2015	2016	2017
Actual Source Electricity	128,757	134,034	104,649	72,694
Actual Natural Gas	58,373	59,387	52,471	47,597
TOTAL (MMBtu)	187,130	193,421	157,119	120,291
Adjustment Method	Model Year	Forecast	Forecast	Forecast
Modeled Source Electricity	128,757	138,873	124,419	108,220
Source Electricity Annual Savings	0	4,839	19,771	35,526
Modeled Natural Gas	58,373	56,934	55,981	55,596
Natural Gas Annual Savings	0	-2,453	3,511	7,999
Total Modeled Energy Consumption (MMBtu)	187,130	195,808	180,401	163,817
Total Improvement in Energy Intensity (%)	0.00%	1.22%	12.91%	26.57%
Annual Improvement in Energy Intensity (%)	0.00%	1.22%	11.69%	13.66%
Total Energy Savings since Baseline Year (MMBtu/Year)	0	2,387	23,281	43,526
New Energy Savings for Current Year (MMBtu/year)	0	2,387	20,895	20,244
Adjustment for Baseline Primary Energy Use (MMBtu/year)	0	8,678	-6,729	-23,313

EnPI Tool Example

Graphical Representation



Technical Assistance: In Plant Trainings

Existing Training Topics:

- Compressed Air
- Pumping
- Steam
- Process heating
- Fans
- Energy Treasure Hunt Exchanges
- Water/Wastewater treatment
- Industrial Refrigeration
- 50001 Ready



- Teach participants how to conduct assessments, use DOE tools, and implement projects
- Open to employees from host plant, peer companies, suppliers
- > 100 INPLTs, 1500 participants since 2011
- Identified > 5 TBTU and \$37 million in energy savings between 2011 and 2015
- Pre-INPLT webinars available on program website

Technical Assistance: Diagnostic Equipment Program

Field data is best for evaluating system performance



- Free of charge, including shipping
- Use equipment for one day, or up to four weeks
- Some technical assistance with selection and usage
- First come, first serve application

Technical Assistance: Tools

AMO suite of industrial system software platforms:

- Measure energy losses
- Quantify savings opportunities
- Developed by national experts
- **NEW: Plant Water Profiler tool**



[Manufacturing Energy Assessment Software for Utility Reduction \(MEASUR\)](#)



Access to DOE and National Lab R&D

Better Plants hosts Technology Days at National Laboratories to:

Tour World-Class Facilities

View Demonstrations of innovative technologies

Hear from experts and Industry peers

Learn about research partnerships

Network with BP partners and researchers



ORNL in 2017



NREL in 2018



Events & Networking

- Annual events:
 - [Better Buildings summit](#)
 - [Industrial Energy Technologies Conference](#)
 - [World Energy Engineering Congress](#)
 - Regional events & focused workshops
- Networking:
 - Forums where partners learn from each other
 - Regional events
 - Technology-based working groups



National Recognition: Examples

Better Project/Practice Awards



Blog Articles

[Home](#) > [Newsroom](#) > [Beat Blog](#) > DOE Better Buildings Recognizes Loews Vanderbilt Hotel for Energy Efficiency Improvements

DOE Better Buildings Recognizes Loews Vanderbilt Hotel for Energy Efficiency Improvements

by Better Buildings Beat Team on Aug 10, 2017

This summer, representatives from the City of Nashville and the Department of Energy traveled to Nashville, Tennessee to honor Loews Hotels & Co. for its energy-efficient upgrades and retrofits at the Loews Vanderbilt Hotel.

Since 2015, the Vanderbilt hotel has improved its energy efficiency by 22 percent and achieved a total energy cost savings of \$328,250 through upgrades to lighting, HVAC systems, guestrooms, and building envelope.



Loews Hotels & Co. showcased its building upgrades and retrofits to an audience of media members, city officials and experts from the Department of Energy. The tour included a stop on the roof to highlight the new building façade. The original roof system prior to the hotel's valve replacement had an insulation effectiveness below 9 percent. Today, Loews Vanderbilt Hotel's roof performs at 21 percent insulation effectiveness, which exceeds energy code by 15 percent.



Social Media



Goal Achievers



Better Buildings Solution Center



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 tipsheets 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](#)

energy.gov/bbsc

- More than 200 industrial solutions tested and proven by Partners
- Find solutions by topic, building type, solution type, building size, sector, technology, location, and more.
- **Technology Focus area:**
<https://betterbuildingsolutioncenter.energy.gov/better-plants/technology-focus-areas>

Supply Chain Initiative

- 5 Better Plants partners are working with 36 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	Volvo Group North America
Chapco	GKN Aerospace	Cascade Engineering Technologies, Inc.	KYB Americas	Alumalloy Metalcastings
Coilplus	Hitchiner	Clearwater Engineering, Inc.	Newman Technologies	Bendix Commercial Vehicle Systems
Complete Design & Packaging	MB Aerospace	Cooperative Industries Aerospace & Defense	Asama Coldwater Manufacturing	Commercial Vehicle Group, Inc.
Durex	RTI International Metals, Inc.	The Harva Company, Inc.	American Mitsuba	Custom Glass Solutions
Lynam	Selmet, Inc.	Research Electro-Optics	NSK Americas	Durable Products
Magnetic Metals	Weber Metals, Inc.	Savage Precision Fabrication	Mahle Engine Components	GB Manufacturing
Rowley Spring & Stamping	Jedco, Inc.	Vanguard Space Technologies	Cardington Yutaka	MEKRA Lang North America
Stanley Spring &		Tri-State Plastics, Inc.		TitanX Engine

Water Efficiency Initiative

- FREE Water management guidance document – topics:
 - Making the business case for water efficiency
 - Prioritizing facilities to focus initial efforts
 - Establishing water baselines and targets
 - Water efficiency examples
- Supplier resources:
 - Better plants assistance for suppliers
 - Webinar on starting your own water efficiency program



Developing a Corporate Water Management Strategy for Manufacturers

Lessons Learned from the DOE Better Buildings Challenge Water Savings Pilot



U.S. DEPARTMENT OF
ENERGY
April 2016

By Prakash Rao, PhD
Lawrence Berkeley
National Laboratory

Access to Other Programs:

Industrial Assessment Centers:

- No-cost energy assessments
- IACs have provided more than 134,000 recommendations for ~18,000 manufacturers.
- Average IAC assessment yields 5-7% implemented energy savings.

Northwest WA, OR, ID, AK
www.northwestCHPTAP.org
 David Van Holde, P.E.
 Washington State University
 360-956-2071
 VanHoldeD@energy.wsu.edu

Upper-West UT, CO, WY, MT, ND, SD
www.upperwestCHPTAP.org
 Gavin Dillingham, Ph.D.
 HARC
 281-216-7147
 gdillingham@harcresearch.org

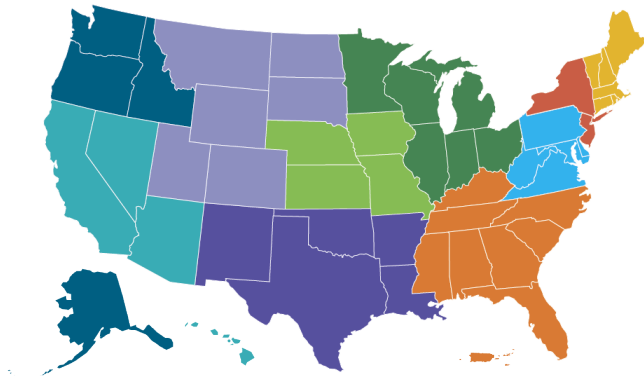
Midwest MN, WI, MI, IL, IN, OH
www.midwestCHPTAP.org
 Cliff Haefke
 University of Illinois at Chicago
 312-355-3476
 chaefk1@uic.edu

New England VT, NH, ME, MA, RI, CT
www.newenglandCHPTAP.org
 David Dvorak, Ph.D., P.E.
 University of Maine
 dvorak@maine.edu
 207-581-2338

New York-New Jersey NY, NJ
www.newyorknewjerseyCHPTAP.org
 Tom Bourgeois
 Pace University
 914-422-4013
 tbourgeois@law.pace.edu

Mid-Atlantic PA, WV, VA, DE, MD, DC
www.midatlanticCHPTAP.org
 Jim Freihaut, Ph.D.
 The Pennsylvania State University
 814-863-0083
 jdf11@psu.edu

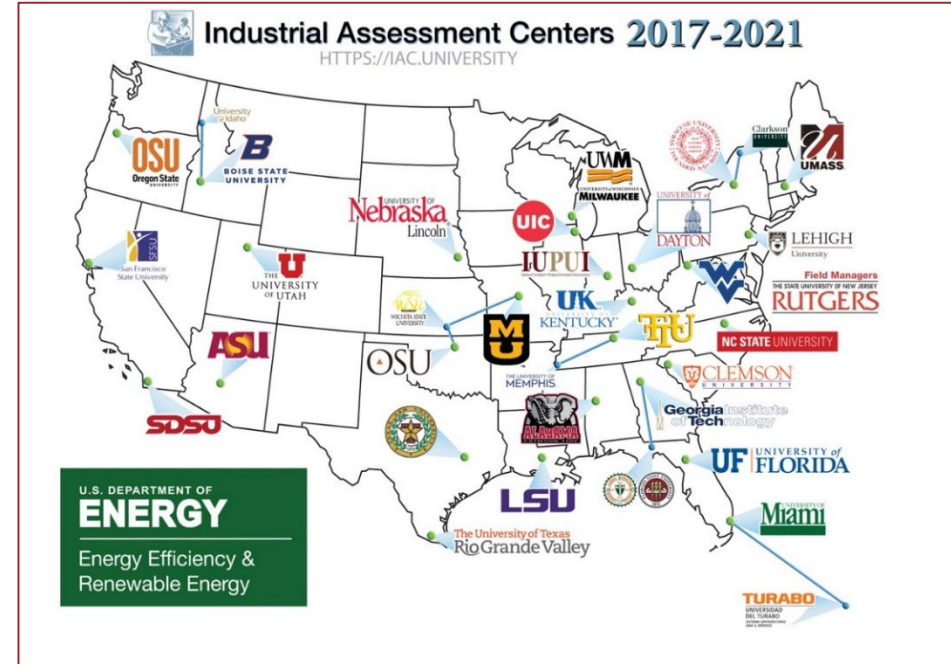
Southeast KY, TN, NC, SC, GA, FL, AL, MS
www.southeastCHPTAP.org
 Isaac Panzarella, P.E.
 North Carolina State University
 919-515-0354
 ipanzarella@ncsu.edu



Western CA, NV, AZ, HI
www.westernCHPTAP.org
 Gene Kogan
 Center for Sustainable Energy
 858-633-8561
 gene.kogan@energycenter.org

Southcentral TX, NM, OK, AR, LA
www.southcentralCHPTAP.org
 Gavin Dillingham, Ph.D.
 HARC
 281-216-7147
 gdillingham@harcresearch.org

Central NE, IA, KS, MO
www.centralCHPTAP.org
 Cliff Haefke
 University of Illinois at Chicago
 312-355-3476
 chaefk1@uic.edu



Combined Heat and Power Technical Assistance Partnerships

- Identify CHP opportunities
- Vendor, fuel, and technology neutral assessments.
- Additional technical assistance for end-users considering CHP

Access to other Programs: 50001 Ready

DOE's Energy Management Program

Step One: Self-declared implementation of ISO 50001

Step Two: Analysis of energy and emissions reductions

Step Three: Submit to DOE for 50001 Ready recognition



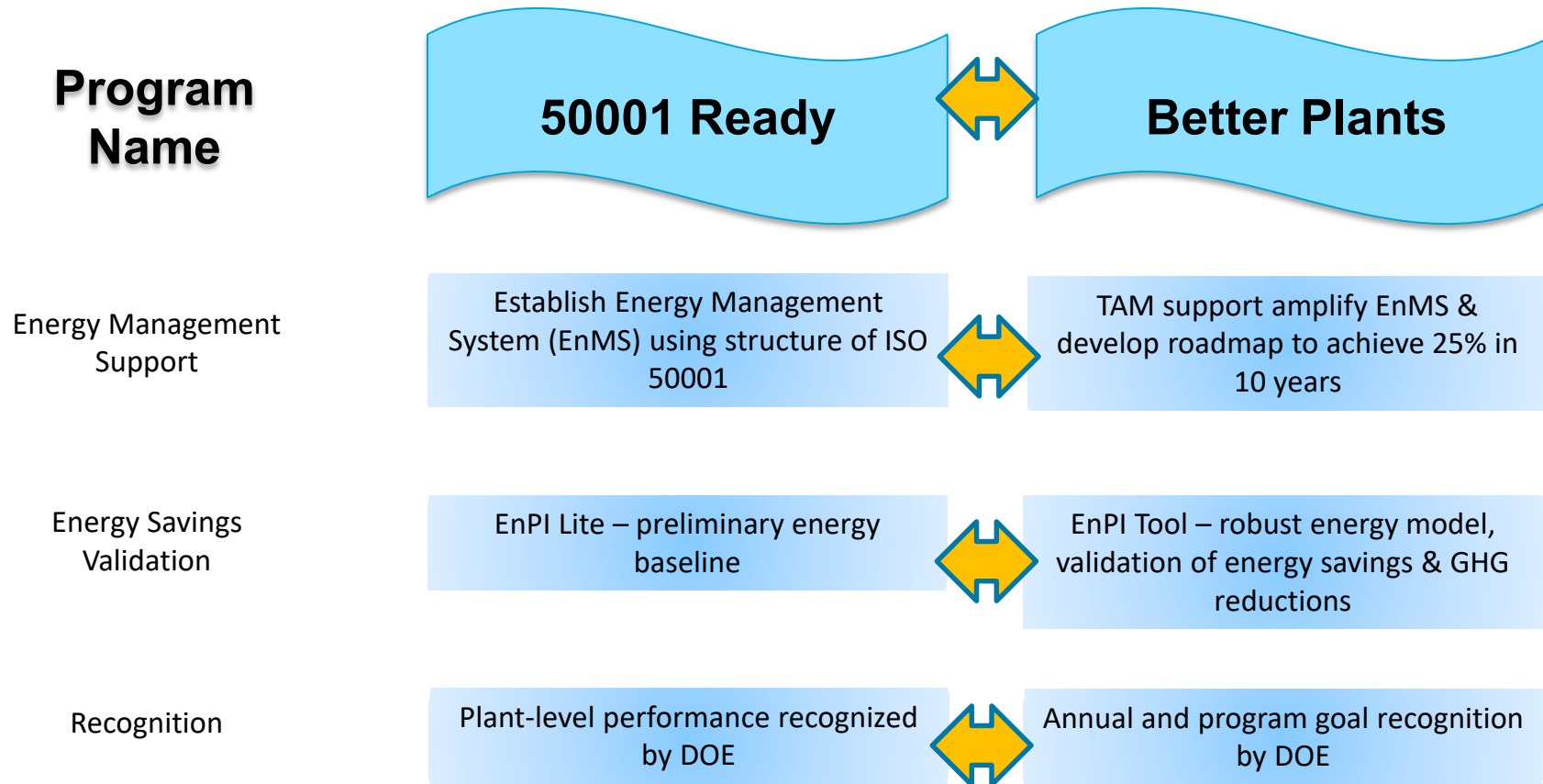
DOE or Utility recognized success for implementing 25 steps

OPTIONAL:

- **Pursue an ISO 50001 Certification**
- **Achieve Superior Energy Performance Certification**

50001 Ready and Better Plants

ISO 50001 Pathway toward Better Plants



Why Partner with Better Plants?

Consider Partnering If:

- **Controlling** operating costs is important
- **Want/Need Technical Assistance** with energy efficiency
- **Networking** with industry-sector peers & independent experts is helpful
- **Recognition** for energy efficiency/sustainability accomplishments is desired



Joining is Easy!

- Simple 2-page agreement
- Should be signed by CEO or a senior executive
- Fill out and email back to: robert.lung@ee.doe.gov



Partnership Agreement

Form

The Better Buildings, Better Plants Program is a national initiative to significantly improve energy efficiency across U.S. industry. Leading manufacturers in the program work to reduce the energy intensity of their business operations by 25% over ten years. The Energy Department helps these industrial partners develop energy management plans and performance metrics, evaluate energy-saving opportunities, train the workforce, and assess annual progress.

Better Plants Partners agree to:

- ▶ Adopt a goal to significantly reduce energy intensity over a 10-year period
- ▶ Report energy intensity, energy use data, and achievements annually to DOE.

Additionally, within 12 months partners agree to:

- ▶ Establish an energy use and energy intensity baseline
- ▶ Develop an energy management plan
- ▶ Designate an energy leader or energy manager

DOE agrees to provide:

- ▶ National recognition including a feature on DOE's website, recognition letters from DOE leadership, and invitations to special events.
- ▶ Technical support to assist the company in developing energy management plans, identifying energy-saving opportunities, tracking energy performance metrics and reaching its energy goal.
- ▶ Additional resources, including access to DOE energy analysis software tools, training webinars, technical guidance documents, and peer-to-peer networking opportunities

Agreement:

My organization is committed to continuous improvement in energy efficiency and agrees to the General Terms of the Better Buildings, Better Plants Program.

Senior Executive Officer (Signature)

Date

Printed Name

Title

Company

Address

Note: DOE will send an official Better Plants Welcome letter to the contact and address listed above

Learn more at http://www1.eere.energy.gov/manufacturing/tech_assistance/betterplants/partners.html



For more Information

TAM info

Daryl Cox

coxdf@ornl.gov

865.574.4129

Better Plants Website:

<http://betterbuildingssolutioncenter.energy.gov/>