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

Industrial Efficiency and Competitiveness: The Untapped Engine

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Kathleen Hogan
Deputy Assistant Secretary for Energy Efficiency
Energy Efficiency & Renewable Energy
U.S. Department of Energy

Overview

- **DOE Priorities**
- **Approach to Assistance / Deployment**
- **Key Initiatives**
  - Better Buildings / Better Plants
  - Superior Energy Performance
  - Workforce
  - State and utility partnerships
  - SEE Action Industrial EE and CHP WG
  - Regional Application Centers
  - Industrial Assessment Centers

Industrial Technologies Program

Improve national energy security, climate, environment, and economic competitiveness by transforming the way U.S. industry uses energy.

Advance manufacturing capability for economic competitiveness

Research & Development

Develop advanced technologies addressing the top opportunities across industry to save energy, reduce emissions, and increase competitiveness

- Next Generation Materials
- Innovative Manufacturing Processes

Technology Deployment

Leverage state, utility, and other local resources to help industry save energy today by improving energy management practices

- Better Plants
- ISO 50001
- Superior Energy Performance

State and U.S. DOE Collaboration

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States and the U.S. Department of Energy can work together to advance efficient manufacturing

- **Develop and Share Supportive Policy, Program, Regulatory Frameworks**
  - SEE Action

- **Encourage and Recognize Corporate Leadership**
  - Superior Energy Performance
  - Better Plants

ISO International Organization for Standardization

- **Provide Access to Tools and Resources**
  - ISO 50001
  - Superior Energy Performance

Energy Efficiency Opportunity

The manufacturing sector offers *significant* opportunities for *cost-effective* savings through increased energy efficiency.

Sector	Primary energy & cost savings (in 2020)	Investment Required* (2009 $)	Savings Achieved (2009 $)	Scope of Potential Opportunity
Manufacturing and Other Industrial	5,030 TBtu/yr $47 billion/yr	$113 billion	$442 billion	330,000 establishments
Commercial, Private**	1,840 TBtu/yr $11 billion/yr	$73 billion	$104 billion	57 billion sq ft
Commercial, State & Local**	860 TBtu/yr $5 billion/yr	$26 billion	$49 billion	18.2 billion sq ft
CHP	1,470 TBtu/yr $7.8 billion/yr	$56 billion	$77 billion	50 GW of additional power

Sources: *Energy Efficiency in the U.S. Economy*, McKinsey & Company, July 2009.

Notes: Savings achieved are net present value (NPV) positive for the 10-year period of 2010-2020.

* Not incremental; does not include maintenance costs

** Includes existing buildings and excludes new construction

Better Buildings, Better Plants

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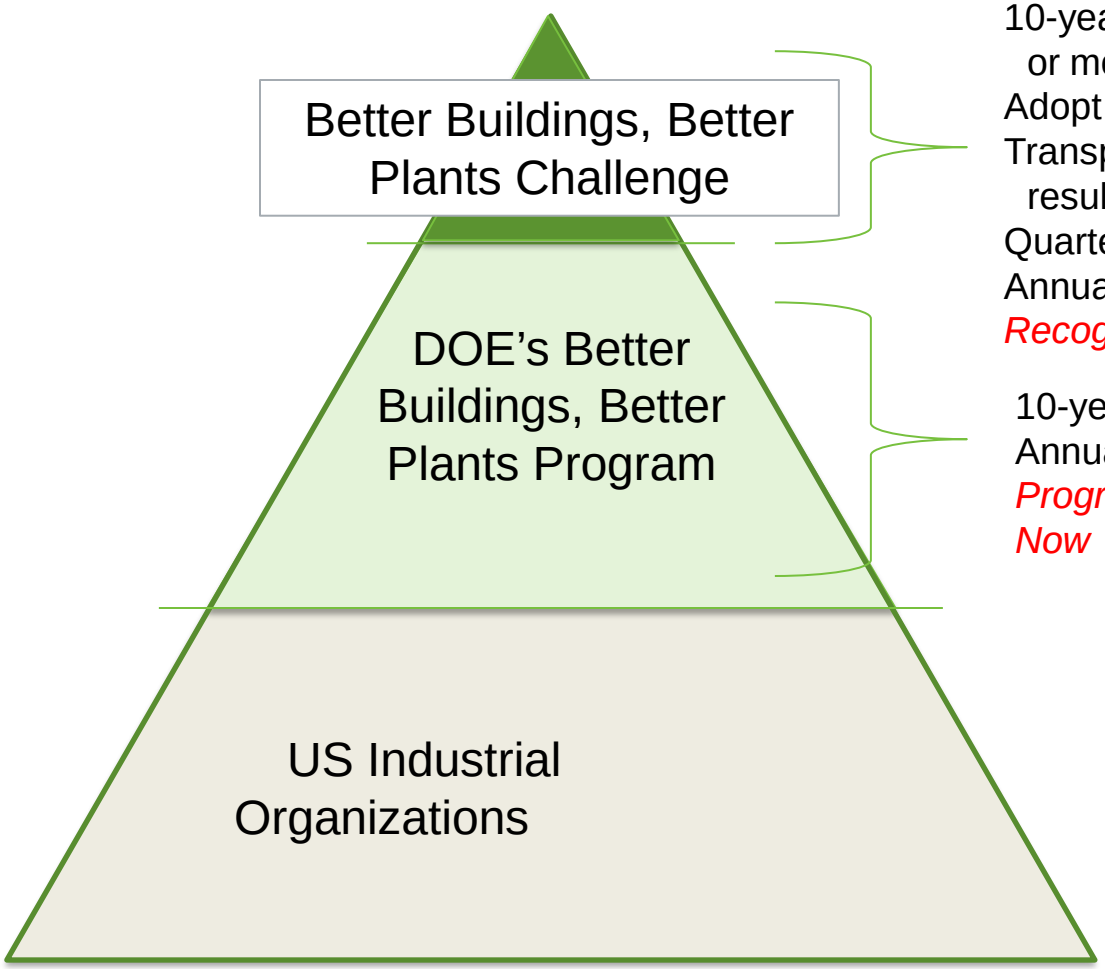
- DOE is evolving its industrial partnership program
  - Align with the **Better Buildings Challenge (BBChallenge)**
  - Provide integration across industrial and commercial sectors
  - Promote leadership, action, innovation, transparency
- The industrial BBChallenge provides 2 opportunities for national recognition based on level of commitment:
  - **Better Buildings, Better Plants *Challenge Partners*** agree to transparently pursue innovative approaches to energy efficiency, and make a significant, near-term investment in an energy saving project or set of projects
  - **Better Buildings, Better Plants *Program Partners*** pledge energy savings goals consistent with national targets and agree to report progress annually to DOE. Program requirements largely match those of the Save Energy Now LEADER initiative

Highlighting Industrial Leadership in the Better Buildings Challenge



10-year, 25% savings target (or equivalent) or more
Adopt "market innovations"
Transparency in market innovations and results
Quarterly reporting on innovations
Annual reporting on results
Recognized as premier market leaders

10-year, 25% savings target
Annual reporting
Program requirements track Save Energy Now

-- Fall Launch for Better Plants Challenge

-- Dec 1 transition for Better Plants Program

Transparency is a Key Part of Leadership

- Transparency is a key component of the Better Buildings, Better Plants Challenge; enables greater replication of successful approaches
- Transparency sought for both:
  - Market innovations—"How you did it"
  - Performance data—"Show us that it really worked"
- Different types of data are reported at different intervals
  - Annual:
    - High-level corporate-wide information on energy saving, investment levels and aggregate returns on investment
    - Improvements at facility level – masked to protect proprietary information
  - Quarterly: Quantitative data demonstrating progress on showcase projects; quantitative and qualitative data showing progress on market innovations

Growing Foundation

ISO 50001 - Energy Management Standard

- Establishes a framework for industrial and commercial facilities and organizations to manage energy.
- Offers companies international approach for
  - Corporate sustainability programs
  - Energy cost reduction initiatives
  - Demand created along the manufacturing supply chain

International Organization for Standardization

Status of ISO 50001

- **Published on June 15, 2011**
- Available for purchase from ANSI
- Developed by ISO Project Committee 242; United States and Brazil led effort with the United Kingdom and China
- 59 countries participated, 14 of which observed

http://www1.eere.energy.gov/energymanagement/index.html

Superior Energy Performance Update

- ANSI/ANAB-accredited certification program
- Provides industrial / commercial facilities with roadmap for continual improvement in EE
- Uses ISO 50001 standard as foundational tool for energy management

Goals:

- Continual improvement in energy performance
- Transparency for validation of improvements and management practices
- Broad participation throughout industry
- Build the energy efficiency market and workforce

Superior Energy Performance for industry will be launched nationwide in 2012.

Superior Energy Performance Demonstrations

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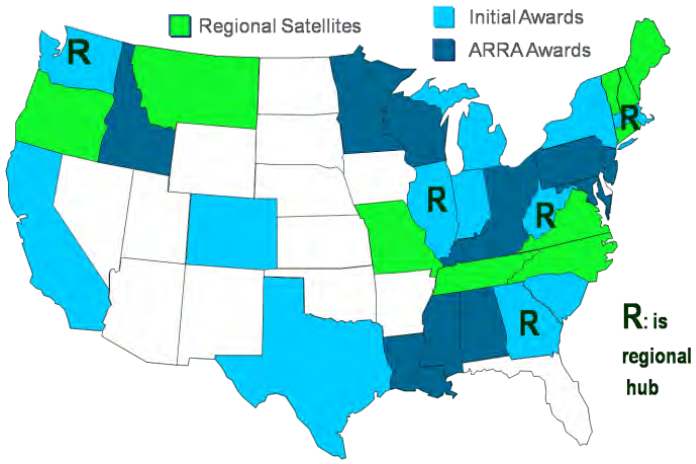
States, regions, and utilities are partnering with the U.S. DOE to further **test Superior Energy Performance** and to **build energy management expertise**.

First five facilities certified in Texas with savings of 7.5 to 16%

- Cook Composites & Polymers
- Freescale Semiconductor, Inc.
- Owens Corning
- Dow Chemical (manufacturing)
- Dow Chemical Co. (energy systems facility)



Current Industrial Participants:

- 3M
- Alcoa
- Allsteel
- Amcor PET
- Bentley Prince Street
- Bridgestone Tire
- Cook Composites & Polymers
- Cooper Tire
- Didion Milling, Inc
- Dixie Chemical
- Dow Chemical
- Eaton
- General Dynamics
- Haynes International
- Holcim
- JR Simplot
- Kenworth Trucks
- Lockheed Martin
- Neenah Foundry Company
- Nissan
- OLAM Spices and Vegetable Ingredients
- Schneider Electric
- Spirax Sarco
- Traco
- Volvo
- World Kitchen

Workforce Development

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A workforce with energy management training and skill is required for appropriate application of ISO 50001 system assessment standards and the Superior Energy Performance M&V Protocol.

- **Certified Practitioners in Energy Management Systems:** Help facilities implement the ISO 50001 energy management standard and prepare for SEP certification
- **Certified Practitioner in Specific System:** Perform compressed air, process heating, pumping, or steam system assessments using ASME system assessment standards to help facilities meet energy performance improvement requirement
- **SEP Lead Auditors and SEP Performance Verifiers:** Perform third-party audits to verify that a facility meets Superior Energy Performance requirements

Fall 2011

First class offered for Certified Practitioners in Energy Management Systems

SEE Action Network

SEE Action is a federal-state-local effort to assist state governments, utilities, and other local stakeholders in:

- Advancing efficiency policies and programs
- Removing barriers and disincentives to realizing energy savings through efficiency
- Growing state-level investments in cost-effective energy efficiency

SEE Action Goal: *To help the nation achieve all cost-effective energy efficiency by 2020 through assisting state and local governments in their implementation of energy efficiency policies and programs*

Eight issue-oriented Working Groups driving investment in energy efficiency

IEE / CHP WG Blueprint

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Achieve an average 2.5% reduction in industrial energy intensity annually through 2020; install 40 GW of new, cost-effective CHP by 2020

Drive Demand for IEE & CHP

1. State, Local, & Utility Programs for Industry
Programs that better meet the needs of industry

2. State Policy Models
Broader adoption of model policies

3. National Energy Efficiency Policy
Enhance national policy with regard to industrial energy efficiency and CHP

4. Education & Outreach
Build corporate culture; foster greater understanding of the economic value of industrial energy efficiency and CHP

Build the Workforce

5. Education & Workforce Development
Identify industry's needs and workforce needs; develop new programs to address needs

6. Develop Training & Academic Curricula
From the plant floor to the corporate level

7. Licensing & Certification Protocols
Certified Energy Manager (CEM); DOE Qualified Specialists; Continuous Energy Improvement, etc.

Promote Efficient Operations & Investment

8. Financing Innovation
Loan guarantees, energy service companies (ESCOs), etc.

9. Financial Incentives
Address industry ROI and refit cycles

10. Technical Solutions
Improve availability of energy efficiency and CHP information and tools for industry

11. Energy Management Programs/Continuous Energy Improvement
Ex: ISO 50001, Superior Energy Performance (SEP), ENERGY STAR, and others

Move the Market

12. Technology Demonstration
Adoption of existing technologies

13. Regulatory Recommendations to Support CHP
Offer comprehensive CHP policies

14. Reduce Uncertainty Related to State Interconnection
Harmonization across broad regions and states

15. Financing Reform
Depreciation rules and Sarbanes-Oxley Act

Green = IEE **and** CHP solution Purple = CHP only solution

First Year Activities

- Identify model state and utilities programs and model state policies
  - Draft IEE & CHP white papers
  - Developing guidebook to assist states in implementing model programs
  - WGA promoting state-level adoption of IEE/CHP WG goals by individual states
- Identify state/utility data collection needs
  - CEE collecting information from more than 150 programs

Working Group Members:

- 2 co-chairs
- 17 members from state programs, coordinating organizations, utilities, research/academia, industry/end-users
- 4 DOE / EPA Leads

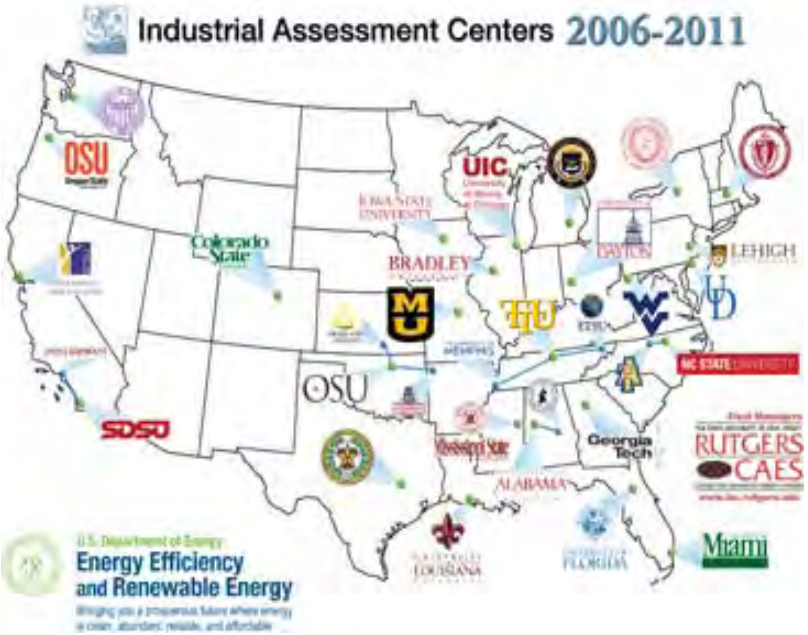
- September 28: Utility-Industry Workshop in Denver, CO
  - Engage industry with utilities and regulators to address key issues related to DSM Program Design, and Measurement & Verification

Share information on best practice programs, issues, solutions

Training Energy Management Engineers

DOE's University-based Industrial Assessment Centers (IACs)

- Current cohort of 26 IACs provide assessments to small and medium-size plants (energy costs below $3 million per year)
  - Identifies $175,000 to $200,000 in potential annual energy savings per plant, with an average implementation rate of 35 to 45%
- Trains engineering students for careers in industrial energy efficiency and energy management
- Helps university professors stay connected to the technical needs in manufacturing
- New cohort of IACs awarded in September



IAC FOA Selections

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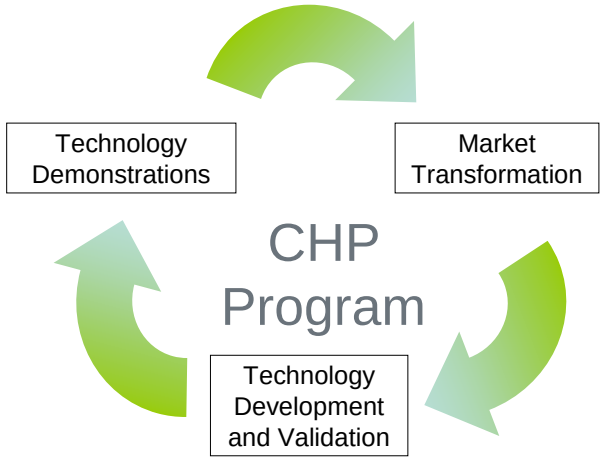
Over $30 million for 24 Universities

- Train 15-20 new students per year
- Conduct ~20 energy assessments per year
- Follow-up implementation/reporting
- Work with private sector partners to support workforce development

University of Alabama	West Virginia University	University Of Dayton	University of Michigan
Texas Engineering Experiment Station	University of Massachusetts	University of Missouri	Indiana University
North Carolina State University	Oregon State University	Boise State University	San Francisco State University
University of Wisconsin-Milwaukee	Iowa State University	Syracuse University	Bradley University
San Diego State University	Colorado State University	Lehigh University	University of Delaware
University of Miami	University of Kentucky	Tennessee Technological University	Oklahoma State University

Combined Heat and Power (CHP) Support

- **Policy Support** – Provide policy-makers and regulators information to address barriers that prevent the widespread adoption of CHP.
- **Technical Assistance** - Support CHP project development through assistance on project feasibility studies, permitting issues, etc.
- **Targeted Education and Market Development** - Inform prospective CHP users on the resources and incentives available to help implement CHP projects.



DOE Resources

- ***Regional Clean Energy Application Centers (RACs)***
- ***SEE Action IEE & CHP Working Group***
- ***Partnerships with Regional Industrial Energy Efficiency Alliances, National Labs, and Trade Organizations***

Thank You