



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

STEAB

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U.S. Department of Energy

- Better Buildings, Better Plants
- Superior Energy Performance
- State & Local Energy Efficiency Action Network
- Combined Heat & Power

Goals:

- 20% savings in commercial and industrial buildings by 2020
- Replicable, demonstrated models across different ownership types / building types

Challenge:

- Leadership opportunity
- Challenge partners commit to:
 - Set public energy savings goals
 - Announce innovative strategies
 - **Share implementation strategies and results**
- Financial allies commit to provide financing
- Utility allies commit to providing data to customers & achieving 5% savings
- DOE supports and recognizes partners



Program launched Dec 2
60+ Partners and Allies to date

Commitments Made:

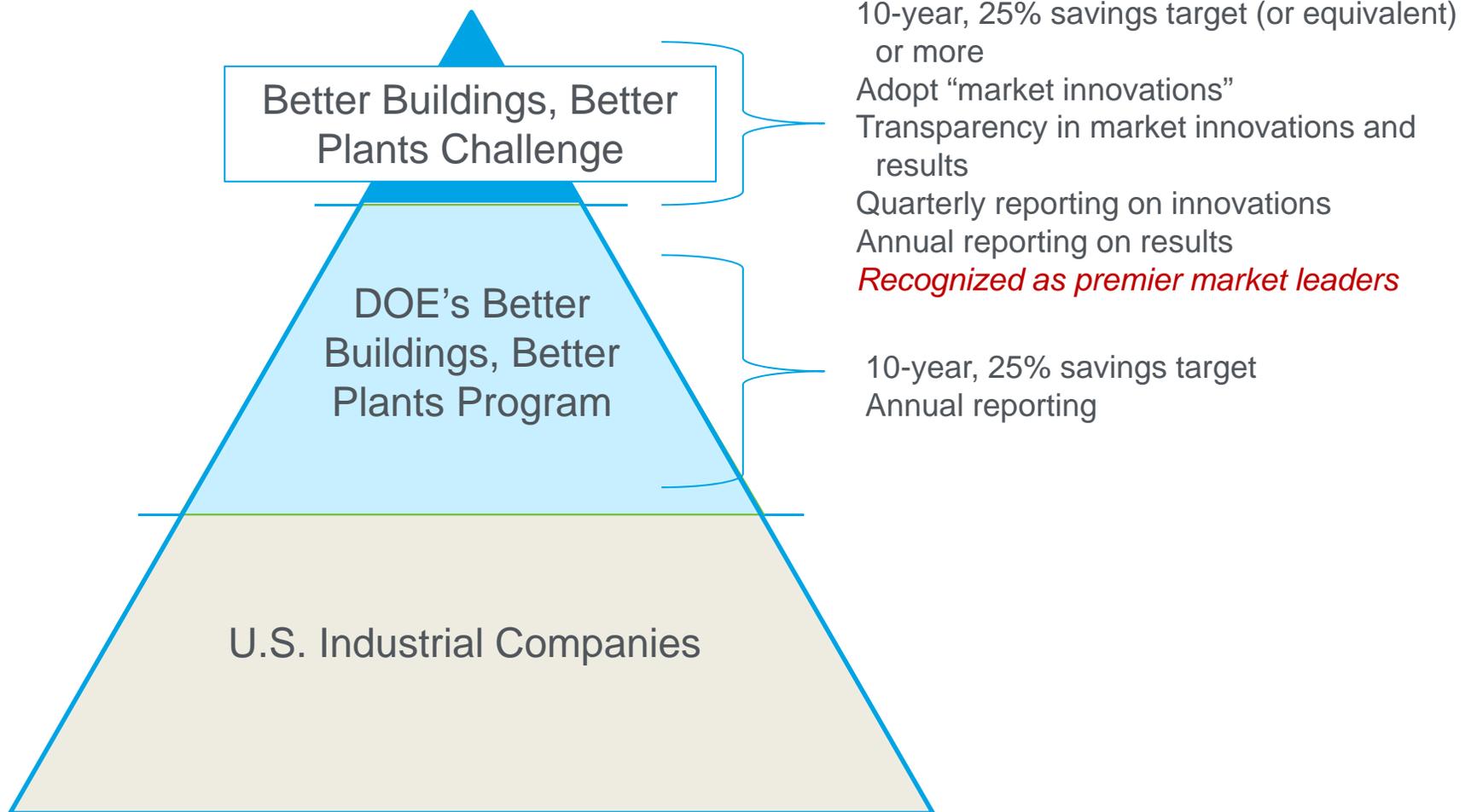
- 1.6 Billion sq ft commercial space
- \$2 Billion in financing through allies
- 300 manufacturing facilities
- Federal facility goal: \$2 Billion in energy investment

Full list of partners and allies at

<http://www4.eere.energy.gov/challenge/>

- DOE has evolved its industrial partnership program to align it with the **Better Buildings Challenge** and provide greater integration across the industrial and commercial sectors
- The industrial component of the Better Buildings Challenge provides different opportunities for national recognition based on level of commitment:
 - **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 (SENL) initiative
 - **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

Highlighting Industrial Leadership through Better Buildings, Better Plants



Better Buildings, Better Plants Program

- Better Buildings, Better Plants Program builds on the success of the Save Energy Now LEADER initiative. Partners:
 - Set a 10-year, 25% energy intensity improvement target
 - Develop energy management plans
 - Track and report energy data annually to DOE
 - Receive national recognition for their achievements
 - Receive support from technical account managers
- Program currently consists of 111 companies and over 1,200 plants, consuming about 1,000 TBtus of energy annually, or about 5% of the total U.S. manufacturing energy footprint
- Most companies are on track to meet the 10-year target

Superior Energy Performance

- Significant (up to 30 percent) energy efficiency in industry can be achieved through operational changes in how energy is managed in an industrial facility; installation of new technologies will further improve energy efficiency;
- Actively managing energy requires an **organizational change in culture**
- **Top management needs to be engaged** in the management of energy on an ongoing basis.
- At its core, energy management requires a group of people to **change their behavior** and **sustain the change**

Scope of energy management



A market-based, ANSI/ANAB-accredited certification program that provides industrial and commercial facilities with a roadmap for achieving continual improvement in energy efficiency while boosting competitiveness.

Goals:

- Drive continual improvement in energy performance
- Develop a transparent system to validate energy performance improvements and management practices
- Encourage broad participation throughout industry
- Support and build the energy efficiency market and workforce



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

Getting Superior Energy Performance Certified

Certification Requirements:

An ANSI/ANAB-accredited Verification Body will conduct a third-party audit to verify that the following requirements are met:

1. Energy Management System Conformance to ISO 50001 Energy Management Standard
2. Energy Performance Improvement (5% minimum over 3 years)



ISO 50001 is a foundational tool that any organization can use to manage energy.

ISO 50001

Components in place:

- Baseline
- Policy
- Plan
- Team/Leader



Superior Energy Performance

Single facility ISO 50001 conformance with validated energy performance improvement

ISO 50001



ISO 50001 – Energy Management Standard

ISO 50001 energy management standard will establish a framework for industrial and commercial facilities and organizations to manage energy.



International
Organization for
Standardization

Potential impacts:

- Could influence up to 60% of the world's energy use across many economic sectors

Uptake of ISO 50001 will be driven by companies seeking an internationally recognized response to:

- Corporate sustainability programs
- Energy cost reduction initiatives
- Demand created along the manufacturing supply chain
- Future national cap and trade programs; carbon or energy taxes; increasing market value of “green manufacturing” / reduced carbon footprint
- International climate agreements

Status of ISO 50001

- Developed by ISO Project Committee 242; United States and Brazil lead effort with United Kingdom and China
- 56 countries participating, 13 of which are observing
- Published June 15, 2011
- ISO PC 242 transitioned to TC 242, developing standards and guidance related to implementation of ISO 50001

1. **Energy policy** representing top management's official statement of the organization's commitment to managing energy.
2. **Cross-divisional management team** led by a representative who reports directly to management and is responsible for overseeing the implementation of the energy management system (EnMS).
3. **An energy planning process** to assess energy uses and identify opportunities for improvement.
4. **A baseline** of the organization's energy use.
5. **Identification of energy performance indicators** (EnPIs) that are unique to the organization and are tracked to measure progress.
6. **Energy objectives and targets** for energy performance improvement at relevant functions, levels, processes or facilities within an organization.
7. **Action plans** to meet those targets and objectives.
8. **Operating controls and procedures** to address all aspects of energy purchase, use, and disposal.
9. **Measurement, management, and documentation** for continuous improvement for energy efficiency.
10. **Internal audits and periodic reporting of progress** to management based on these measurements.

Texas SEP (Alpha) Pilot Project, 2008-2010

DOE worked with the **University of Texas at Austin** to pilot Superior Energy Performance in Texas facilities:

- Field tested elements of Superior Energy Performance
- Implemented energy management systems using ANSI MSE 2000:2008, which is consistent with ISO 50001
- Conducted audits and tested SEP measurement and verification
- Established the first ANSI/ANAB-accredited Verification Body for Superior Energy Performance
- **Certified the first plants to Superior Energy Performance**



First Facilities Certified to Superior Energy Performance	SEP Certification	Energy Performance Improvement
Cook Composites and Polymers Houston, TX	Gold	14.9%
Freescale Semiconductor, Inc. West Austin, TX	Silver	6.5%
Owens Corning Waxahachie, TX	Silver	9.6%
Dow Chemical Company Texas City, TX (manufacturing facility)	Platinum	17.1%
Dow Chemical Company Texas City, TX (energy systems facility)	Silver	8.1%

SEP Demonstrations involve:

- **Testing ANSI-accredited Superior Energy Performance** program
- Using newly-released ISO 50001 energy management standard
- Third party verification on energy performance improvement using measurement & verification protocol
- 35 companies in 20 states

Industrial Participants:

- 3M Company
- Alcoa
- Allsteel
- Amcor PET
- Ascend Performance Materials
- Bentley Prince Street
- Bridgestone Tire
- Coca-Cola
- Cook Composites & Polymers
- Cooper Tire
- Cummins
- Didion Milling, Inc
- Dixie Chemical
- Dow Chemical
- Eaton
- Freescale Semiconductor
- General Dynamics
- Harbec Plastics
- Haynes International
- Holcim
- Ingersoll Rand
- JR Simplot
- Kenworth Trucks
- Lockheed Martin
- MedImmune
- Neenah Foundry Company
- Nissan
- OLAM Spices
- Owens Corning
- Republic Conduit
- Schneider Electric
- Spirax Sarco
- Traco
- UTC/Sikorsky
- United States Mint
- Volvo
- World Kitchen

www.superiorenergyperformance.net

State & Local Energy Efficiency Action Network (SEE Action)

- **Goal: Achieve all cost-effective energy efficiency by 2020**
- 200+ Leaders: State/local governments, utilities, NGOs, businesses – in eight working groups
- EPA/DOE facilitated
- Provide model policies, best practices, and recommendations - based on past success
 - Blueprints finalized
 - Many materials to be final this spring/summer
 - Outreach underway
- Detailed Technical Assistance on many programs/policies



www.eere.energy.gov/seeaction

Combined Heat & Power

Combined Heat and Power

Benefits of CHP

- High efficiency; up to 75-80% efficient versus 45% efficiency from producing heat and electricity separately
- Cost savings to user; assisted by low natural gas prices
- Emissions reductions
- Improved grid reliability; distributed in location

Policy Issues

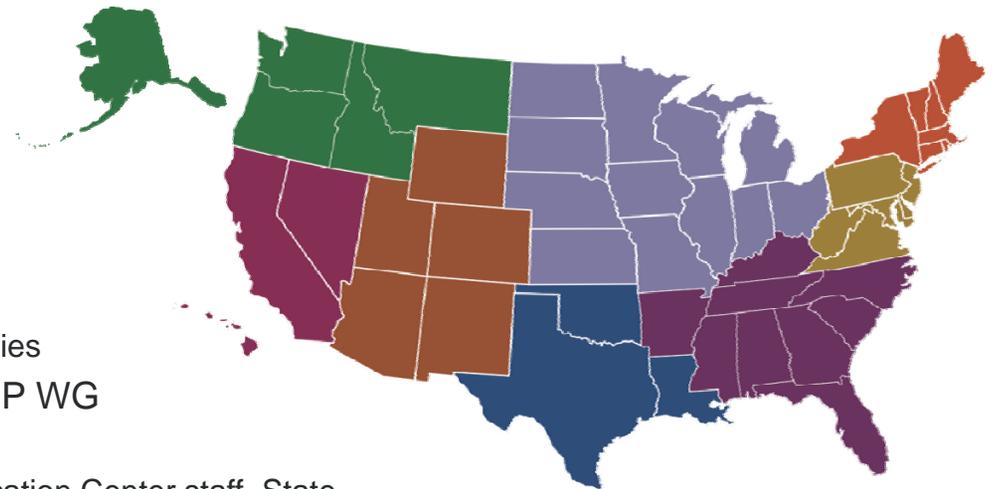
Significant state policy barriers exist, requiring cooperation between: regulators, utilities, environmental stakeholders, and end-users

40 gigawatts of new, cost-effective CHP by 2020 would yield:

- 1 quad savings
- 150 mmt CO₂ savings
- 75% of McKinsey CHP economic potential

Federal Resources

- 8 Regional Clean Energy Application Centers
 - Help evaluate state policies and impact on CHP
 - Share best practice policies from other states,
 - Identify manufacturing facilities with CHP potential
- EPAs pending Boiler MACT rule compliance:
 - 14,000 major source boilers may be affected
 - DOE will provide technical assistance to these facilities
- SEE Action Industrial Energy Efficiency and CHP WG
 - Two regional workshops – for SE and the MW
 - Attendees will include Regional Clean Energy Application Center staff, State regulators, utilities, industry



- DOE has joined EPA in an effort to help ensure that major sources burning coal and oil have information on cost-effective clean energy strategies for compliance.
- DOE is currently engaged in providing technical information on clean energy options to industry through its regional Clean Energy Application Centers (CEACs).
- Through 4 CEACs, DOE will provide site-specific technical and cost information to the major source facilities that are currently burning coal or oil in their boilers.
- These facilities may have opportunities to develop compliance strategies, such as CHP, that are cleaner, more energy efficient, and that can have a positive economic return for the plant over time.
- Boiler MACT technical assistance will be piloted in Ohio starting mid-March and rolled out nationally when the EPA reconsideration process is complete (Spring 2012).

- Compliance with limits will be expensive for many coal and oil users
- May consider converting to natural gas
 - Conversion for some oil units?
 - New boilers for most coal units?
- May consider moving to natural gas CHP
 - Represents a productive investment
 - Potential for lower steam costs due to generating own power
 - Higher overall efficiency and reduced emissions
 - Higher capital costs, but partially offset by required compliance costs or new gas boiler costs
 - State / local / utility incentives can help

Potential CHP Capacity*

Fuel Type	Number of Facilities	Number of Affected Units	Boiler Capacity (MMBtu/hr)	CHP Potential (MW)
Coal	333	760	177,435	17,746
Heavy Liquid	194	422	52,358	5,237
Light Liquid	145	330	29,495	2,950
Total	672*	1,512	259,288	25,933

*Some facilities are listed in multiple categories due to multiple fuel types; there are ~621 affected facilities

CHP potential based on average efficiency of affected boilers of 75%; Average annual load factor of 65%, and simple cycle gas turbine CHP performance (power to heat ratio = 0.7)

* These #'s are still being refined

“Because of coal plant retirements, educating consumers on combined heat power is of particular interest to the PUCO. A facility’s decision to invest in CHP may constitute a rational market response that not only benefits the facility but which will also supports grid reliability in Ohio.”

- Public Utilities Commission of Ohio Chairman Todd
Snitchler. February 23, 2012

<http://www.puco.ohio.gov/puco/index.cfm/industry-information/industry-topics/us-doe-pilot-program-for-combined-heat-power/>

For More Information

- Better Buildings, Better Plants
<http://www4.eere.energy.gov/challenge/>
- Superior Energy Performance
http://www1.eere.energy.gov/manufacturing/tech_deployment/sep.html
- Combined Heat & Power
<http://www1.eere.energy.gov/manufacturing/distributedenergy/ceacs.html>
- DOE webpage on Boiler MACT Technical Assistance
<http://www1.eere.energy.gov/manufacturing/distributedenergy/boilermact.html>

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