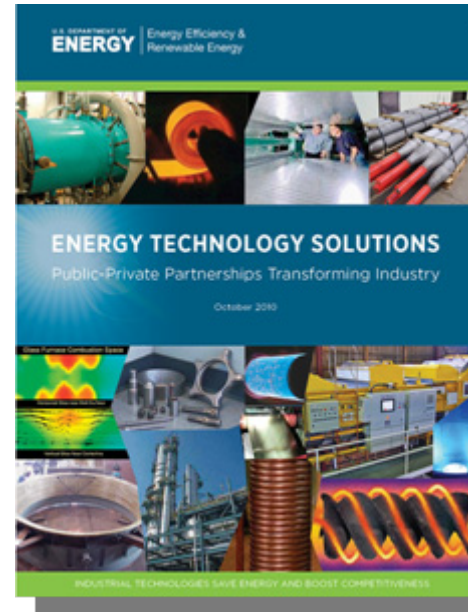


ITP: Delivering Results for 30 Years

Working with industry, we have successfully developed and moved cutting-edge technologies and energy-saving measures into practice.

- Produced >220 commercialized technologies
- Obtained 215 patents between 1994 and 2009
- Received 51 prestigious *R&D 100* awards since 1991
- Reached more than 33,000 industrial plants
- Saved 9.3 quads and reduced emissions by 755 million metric tons of CO₂



Harness
Scientific
Ingenuity

Spur
Innovation

Leverage
Resources

Change
Corporate
Culture

Support U.S. industrial companies to continuously improve energy efficiency, achieve ambitious and measurable energy goals, and reduce carbon emissions—while increasing competitiveness

- Inspire U.S. companies to embrace a **corporate culture** that values good energy management.
- Build technical and **workforce capacity**.
 - Establish a lasting **infrastructure** to support sustained industrial energy management and savings.
- **Leverage** resources to maximize impacts.
- Recognize significant, **verified energy savings**.
- Spur innovation and widespread adoption of **energy-efficient, advanced manufacturing technologies**.



Photo from MicroSoft Office clip art

- Time and again, industrial energy efficiency has been demonstrated to be *cost effective* while having a positive effect on productivity
- Despite this, energy efficiency improvements with very favorable payback periods often *do not get implemented*
- Even projects that are implemented may *not be sustained* due to lack of supportive operational and maintenance practices
- Energy efficiency is still viewed during hard times as *a luxury that industry can't afford*, rather than a strategic investment in future profitability

Problem: ***Energy efficiency is not integrated into daily management practices.***

Solution: ***Top management needs to be engaged in the management of energy on an ongoing basis.***

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
later in 2011.

- Foster a corporate culture of **continuous improvement** in energy efficiency
- Use **ISO 50001** standard as foundational tool for energy management
- Establish a **tiered program** that provides an entry point for companies at all levels of experience with energy management
- Create a **verified record** of energy performance improvement.
- Potentially **create value** for corporate energy savings and carbon reductions in utility, state, regional, national, and international trading markets



U.S. Council for Energy-Efficient Manufacturing

U.S. DEPARTMENT OF
ENERGY

Energy Efficiency &
Renewable Energy

- Acts as champion of U.S. industry in pursuing national energy efficiency goals.
- Seeks to improve the energy intensity of U.S. manufacturing through a series of initiatives.
- Guides development of **Superior Energy Performance**.

lyondellbasell

3M

PPG

Ford

EASTMAN

OWENS
CORNING

ALCOA

Save
ENERGY
Now®

ANSI
ANSI Accredited Certification Program

HUNTSMAN

hp

Weyerhaeuser

SSAB

DOW

NATIONAL ASSOCIATION OF
Manufacturers

ENERGY STAR

ALLIANCE TO
SAVE ENERGY
Creating an Energy-Efficient Work

NIST
National Institute of
Standards and Technology

Texas Industries of the Future

TOYOTA

Texas Industries of the Future

ISO 50001 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

- Under development by ISO Project Committee 242; United States and Brazil lead effort with the United Kingdom and China
- 56 countries participating, 13 of which are observing
- Final Draft International Standard (FDIS) released March 2011
- Ready for publication by August 2011

1. *Energy policy* 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
3. *Energy review* to assess current and planned energy use, energy sources and consumption and identify opportunities for improvement
4. *Baseline(s)* of the organization's energy use
5. *Energy performance indicators* (EnPIs) that are unique to the company and are tracked against the baseline 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* for significant energy uses
9. *Measurement, management, and documentation* for continuous improvement for energy efficiency
10. *Internal audit of progress* reported to management based on these measurements.

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



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



Superior Energy Performance (SEP)

A **market-based certification program** that provides industrial facilities and commercial buildings with a roadmap for achieving **continuous improvement** in energy efficiency while boosting competitiveness.

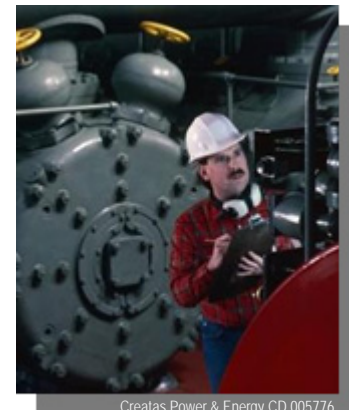
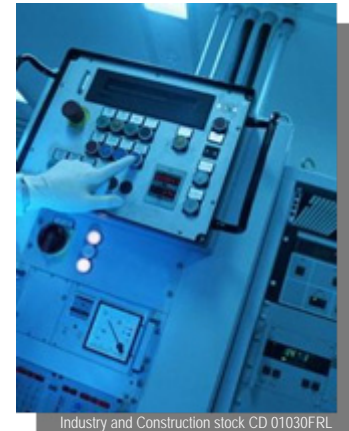
- Uses ISO 50001 standard as foundational energy management system
- **Sets minimum criteria for energy performance improvement**
- Develops **system to validate** energy intensity improvements and management practices
- Encourages broad participation throughout industry, buildings, and public sector



U.S. Superior Energy
Performance
launches in 2011

Benefits To Companies

- **Recognition**
 - Publicly recognized as leader in sustainable use of energy resources (local and financial community)
 - Customers may grant preferred supplier status
- **External financial incentives**
 - Energy efficiency credits (electric utility & others)
 - Potential carbon credits (state, region, and national)
- **Systematic framework for continuous improvement**
 - Consistent with ISO 50001 energy management and ASME system assessment standards
 - Provides tools and resources to assist implementation and validation of sustained energy performance improvement



The two-tiered approach accommodates:

- Maturity of facility's energy management program
- Level of external validation desired
- Business climate/cycle

Two Program Tiers

Partner

Self Declaration

Criteria

- Conformance to ISO 50001
- Measure and audit energy performance improvement

Performance Levels

- Energy performance improvement required

Method of Verifying Results

- Self Declaration

Certified Partner

ANSI/ANAB-accredited certification

Criteria

- Conformance to ISO 50001
- Measure, verify, and certify energy performance improvement

Performance Levels

- Energy performance improvement required, minimum requirements set by program
- Two Pathways Available: Energy Performance or Mature Energy

Method of Verifying Results

- ANSI/ANAB-accredited certification with on-site visit



SEP Performance Criteria for Certification Levels

| Performance Characteristics | | Silver | Gold | Platinum |
|-----------------------------------|--|---|---|--|
| Energy Performance Pathway | Energy Performance Improvement | Meets 5% energy performance improvement threshold over the last 3 years. | Meets 10% energy performance improvement threshold over the last 3 years. | Meets 15% energy performance improvement threshold over the last 3 years. |
| Mature Energy Pathway | Energy Performance Improvement | Demonstrates an energy performance improvement of 15% or more over the last 10 years. | Demonstrates an energy performance improvement of 15% or more over the last 10 years. | Demonstrates an energy performance improvement of 15% or more over the last 10 years. |
| | Score on Best Practice Scorecard <i>Includes credits for energy management best practices and energy performance improvements beyond 15% over the last 10 years.</i> | <ul style="list-style-type: none"> Meets a score of at least 35 and up to 60 out of 100 total points for Best Practice Scorecard Minimum of 25 points required for the energy management best practices. | <ul style="list-style-type: none"> Meets a score of at least 61 and up to 80 out of 100 total points for Best Practice Scorecard Minimum of 25 points required for the energy management best practices and 10 for energy performance. | <ul style="list-style-type: none"> Meets a score of at least 81 out of 100 total points for Best Practice Scorecard Minimum of 25 points required for the energy management best practices and 10 for energy performance. |

Standards & Protocols

Energy Management Standard



**System Assessment
Standards**



**Measurement & Verification
Protocol**

Certified Practitioners

**Certified Practitioners in Energy
Management Systems**

**Certified Practitioners in
[Type] System**

**SEP Lead Auditors
SEP Performance Verifiers**

Assessment standards for specific energy systems provide immediate opportunity for energy performance improvement in many facilities. Use of the standards is **not** required for certification but will help plants define a pathway for achieving energy savings.

Standards address:

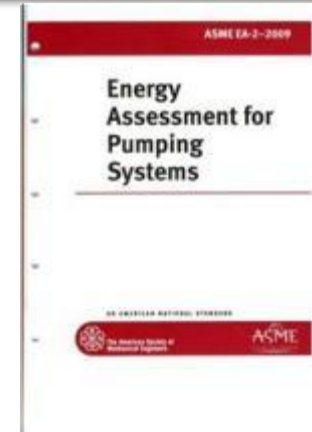
- Organizing an assessment
- Conducting an assessment
- Analyzing the data collected and developing efficiency recommendations
- Reporting and documentation

Purchase standards and guidance documents from ASME for \$35 (print or digital):

- <http://catalog.asme.org/home.cfm?CATEGORY=CS&TaxonomyItemID=3191>
- The guidance document for the compressed air system standard will be available by the end of February 2011.

Available Standards:

- Pumping
- Compressed Air
- Steam
- Process Heating



The SEP Industrial Measurement and Verification (M&V) Protocol is a methodology to:

1. Verify results and impact from implementation of energy management.
2. Track energy performance changes over time for the overall facility.
3. Document energy performance normalized to production.



Significant training and skill are required for appropriate application of the energy management standard, system assessment standards, and the M&V Protocol. Superior Energy Performance will help to build this workforce.

- **Certified Practitioners in Energy Management Systems:**

Help facilities implement the ISO 50001 energy management standard and prepare for SEP certification

- **Certified Practitioner in [Type] 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 for Certified Practitioners in Energy Management Systems
- Sign up to receive updates on Superior Energy Performance website.

http://www.superiorenergyperformance.net/certified_practitioners.html

Since May 2008, DOE has worked with the University of Texas at Austin to pilot Superior Energy Performance in Texas facilities.

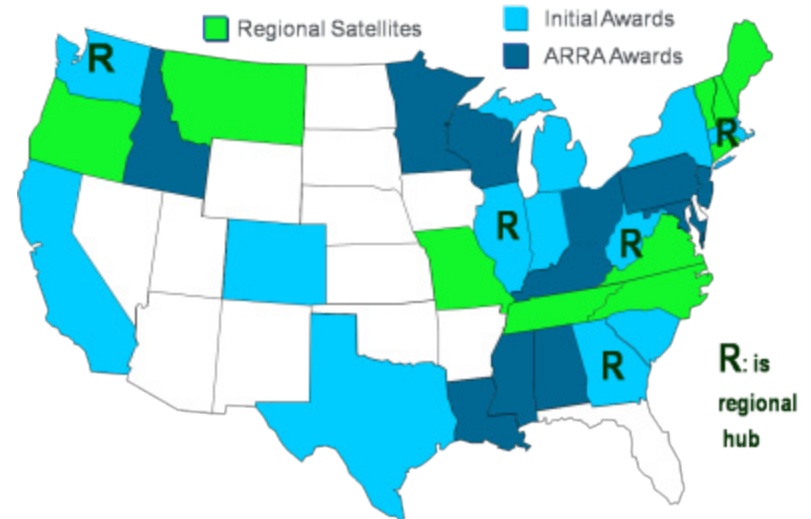
- Field tested elements of Superior Energy Performance
- Conducted audits using ANSI MSE and M&V Protocol
- Established the first ANSI/ANAB-accredited Verification Body for Superior Energy Performance

| First facilities certified to Superior Energy Performance: | Superior Energy Performance certification |
|---|--|
| Cook Composites and Polymers Co. Houston, Texas | Gold |
| Freescale Semiconductor, Inc. West Austin, Texas | Silver |
| Owens Corning Waxahachie, Texas | Silver |
| Union Carbide (subsidiary of the Dow Chemical Co.) Texas City, Texas (Manufacturing facility) | Platinum |
| Union Carbide (subsidiary of the Dow Chemical Co.) Texas City, Texas (Energy systems facility) | Silver |

DOE's Industrial Technologies Program is conducting State/Regional Energy Management Demonstration Projects. ITP has funded 23 state awards starting in 2009 to help industry save energy.

Energy Management Demonstration Goals

- **Provide a roadmap** to achieve ambitious goals to reduce industrial energy intensity.
- **Test the elements of Superior Energy Performance.**
- **Build energy management expertise** at the regional, state, and plant level by showcasing lessons learned and best practices.
- **Broaden energy savings** throughout the nation.



Kick-Off Dates

- **2009:** Northwest region
- **2010:** Southeast, Midwest, and Mid-Atlantic regions
- **2011:** California, Colorado, Texas (second round) and Northeast region

<http://www.eere.energy.gov/industry/energymanagementdemonstrations/>

Demonstration Approach

1. State or region identifies an appropriate demonstration plant based on provided guidelines
2. Three face-to-face training sessions for the facility and consultants
3. Monthly training for the consultants (15-month implementation schedule)
4. Consultants coach facility to implement energy management system in conformance with ISO 50001
5. Facility and consultants hold quarterly review with facility management and Energy Management Demo team lead
6. Facility applies for Superior Energy Performance as early as 18 months after initial training

PARTICIPANTS

- 3M
- Alcoa
- Amcor PET
- Bridgestone Tire
- Cook Composites & Polymers (2 plants)
- Cooper Tire
- Didion Milling, Inc
- Dow Chemical (2 plants)
- Eaton
- Freescale Semiconductor
- General Dynamics
- Gray Harbor Paper
- Haynes International
- HNI / Allsteel
- JR Simplot
- Kenworth Trucks
- Neenah Foundry Company
- Nissan
- Owens Corning
- Schneider Electric
- Spirax Sarco
- Traco (Alcoa)
- Volvo
- World Kitchen

Launching Superior Energy Performance

Developed key program elements: ISO 50001, M&V Protocol, system assessment standards, ITP tools & training

Formed U.S. CEEM and developed certification strategy and scheme

Field-test industrial certification program with regional and state partners

Train and qualify Certified Practitioners and Auditors

Select SEP Program Administrator to operate and manage program.

Launch SEP Program (industrial): 10/2011

SEP Program is self-sufficient on fees in 2013

2007

2008

2009

2010

2011

2012

2013

2014

- GSEP is conceived as an international network of national government agencies, national-level certification programs, and other public/private sector organizations that will catalyze continuous energy performance improvements in **commercial buildings and industrial facilities** of all performance levels.
- The GSEP partnership includes Canada, the European Commission, France, India, Japan, Korea, Mexico, Russia, South Africa, Sweden, and the United States.
- GSEP was announced in July 2010 at the Clean Energy Ministerial, which convened 25 energy ministers from 20 countries and the European Commission.
- Clean Energy Ministerial provided a forum for like-minded countries to take specific steps forward to promote clean energy technologies.
- See www.cleanenergyministerial.org/gsep



For more information:

www.superiorenergyperformance.net