The Next Generation of Energy Management: ISO 50001 and Superior Energy Performance

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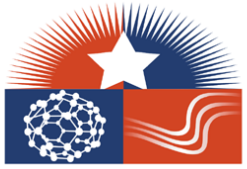

Texas Industries of the Future

Topics

- **International Standard for Energy: ISO 50001**
- **Superior Energy Performance**
- **Results from Texas Pilot Project**

Problem: Potential Energy Efficiency Benefits Are Largely Unrealized

The Problem:

- 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 supporting operational and maintenance practices

The Solution:

- *Integrate energy management* into the organization's business and management processes.
- *Engage top management* on an ongoing basis.

International Management Standard for Energy: 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.

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

International Organization for Standardization

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 is transitioning to ISO TC 242 to develop supporting standards

To purchase ISO 50001 from ANSI

ISO 50001 - Energy Management Standard

- Requires an organization to establish, implement, maintain, and improve an energy management system, enabling **systematic** achievement of **continual improvement in energy performance**, energy efficiency, and energy conservation.
- **Imposes requirements on energy supply and consumption:**
  - **Measurement**
  - **Documentation and recordkeeping**
  - **Design and procurement practices for energy-using equipment and systems**
  - **Processes and personnel**
- Applies to all factors that can be monitored and influenced by the organization to affect energy use.
- **Does not prescribe specific performance criteria** with respect to energy.
- Designed to be used independently, yet can be aligned or integrated with other management systems (e.g., ISO 9001 and ISO 14001). Applicable to all organizations that use energy.

ISO International Organization for Standardization

Key Elements of an Energy Management Standard

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

Key Elements of an Energy Management Standard

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.

11. *Management review* to determine the effectiveness of the EnMS and resulting energy performance improvements

Superior Energy Performance

U.S. Council for Energy-Efficient Manufacturing

- 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.**

SEP Provides a Path for Continuous Improvement in Energy Management

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 performance improvements and management practices
- Applies to any type of organization using energy-- **industry, buildings, and public sector**
- Supports and builds the energy efficiency **market and workforce**

U.S. Superior Energy Performance launches in 2012

Superior Energy Performance

Benefits To Companies

- **Recognition**
  - Publicly recognized as leader in sustainable use of energy resources (local and financial community)
- **Economic**
  - Sustained cost savings
  - Supply chain interest in energy/carbon footprint
  - 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

Superior Energy Performance Certification

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 Program Design

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 *Includes credits for energy management best practices and energy performance improvements beyond 15% over the last 10 years.*	• 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.	• 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.	• 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.

SEP Measurement and Verification Protocol

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 or other variables.

Resources to Help Facilities Prepare for Certification

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

Texas Pilot Project

Texas Pilot Project Participants

- **Cook Composites and Polymers Co.**
  Houston Plant
  - Employment: 36
  - Energy Use: >100,000 MM Btus

- **Freescale Semiconductor Inc.**
  Oak Hill Plant
  - Employment: 2,300
  - Energy Use: 682,000 MM Btus

- **Owens Corning**
  Waxahachie Plant
  - Employment: 345
  - Energy Use: >1,000,000 MM Btus

- **Dow Chemical Company**
  Texas City Operations
  TCO Employment: 345
  TCO Energy Use: 5,600,000 MM Btus
  - Isopropanol Plant
  - Energy Systems Plant

Texas Pilot Project 2008-2011

May 2008-Feb 2011, DOE worked with the University of Texas at Austin to pilot Superior Energy Performance in Texas facilities. Certification levels are:

- Silver—5 to 10 %
- Gold—10 to 15%
- Platinum—greater than 15%

First Plants Certified to Superior Energy Performance	Superior Energy Performance Certification Level
Cook Composites and Polymers Co. Houston, Texas	Gold
Freescale Semiconductor, Inc. Oak Hill, Texas	Silver
Owens Corning Waxahachie, Texas	Silver
Union Carbide (subsidiary of the Dow Chemical Co.) Texas City, Texas (Isopropanol Plant)	Platinum
Union Carbide (subsidiary of the Dow Chemical Co.) Texas City, Texas (Energy Systems Plant)	Silver

For more information in Texas:

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For information about the national program or demonstration programs in other states:

www.SuperiorEnergyPerformance.net

http://www1.eere.energy.gov/industry/