Energy Management Standards (EnMS)

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January, 2009

Why an Energy Management Standard?

- Most energy efficiency in industry is achieved through changes in ***how energy is managed*** in a facility, rather than through installation of new technologies;
- An energy management standard provides a method for integrating energy efficiency into existing industrial or commercial management systems for continuous improvement;
- All existing and planned energy management standards are compatible with ISO 9000/14000[1];
- Companies who have voluntarily adopted an energy management plan (a central feature of an EnMS – Standard) have achieved major energy intensity improvements[2].

1 International Organization for Standardization (ISO)

2 Btu/lb of product

Business Benefits

Implementation of an energy management plan assists a company to:

- Develop a baseline of energy use
- Actively manage energy use and costs
- Reduce emissions without negative effect on operations
- Continue to improve energy use/product output over time
- Document savings for internal and external use (e.g. emission credits)

Energy Management Results

Companies who have used energy management to achieve major energy intensity improvements include:

- **Dow Chemical** achieved 22% improvement ($4B savings) between 1994 and 2005, and is now seeking another 25% from 2005 to 2015
- **United Technologies Corp** reduced global GHG emissions by 46% per dollar of revenue from 2001 to 2006, and is now seeking an additional 12% reduction from 2006 to 2010
- **Toyota's** North American (NA) Energy Management Organization has reduced energy use per unit by 23% since 2002; company-wide energy-saving efforts have saved $9.2 million in NA since 1999.

1 Btu/lb of product

Components of an Energy Management Standard(EnMS)

Typical features include:

1. A ***strategic plan*** that requires measurement, management, and documentation for continuous improvement for energy efficiency;
2. A ***cross-divisional management team*** led by a representative who reports directly to management and is responsible for overseeing the implementation of the strategic plan;
3. ***Policies and procedures*** to address all aspects of energy purchase, use, and disposal;

Continued

Components of an EnMS Standard

4. ***Projects*** to demonstrate continuous improvement in energy efficiency;
5. Creation of an ***Energy Manual***, a living document that evolves over time as additional energy saving projects and policies are undertaken and documented;
6. Identification of ***key performance indicators***, unique to the company, that are tracked to measure progress; and
7. ***Periodic reporting*** of progress to management based on these measurements

Energy Management Principles

- Bridge management and technology. Technology alone cannot achieve optimal savings, but when coupled with O&M practices, as well as, management systems can lead to significant savings.
- Commitment by upper level management
- Development of management strategies
- Clearly stated goals on energy efficiency, waste reduction, and sustainability
- Communication of goals, tactics, and achievements throughout all levels of the firm
- Delegation of responsibility and accountability to the appropriate personnel
- Sustained tracking and assessment of energy use and technology application
- Continuous investigation of potential energy reduction projects
- Application of business investment models to energy technology projects
- Establishment of an internal recognition and reward program for achieving energy goals.

Energy Management Resources

- Energy Quick Start

www.energyquickstart.org

Combines DOE, EPA and NIST energy efficiency program resources in one website

Energy Management Resources, continued

- Georgia Tech Management System for Energy: ANSI/MSE 2000:2008

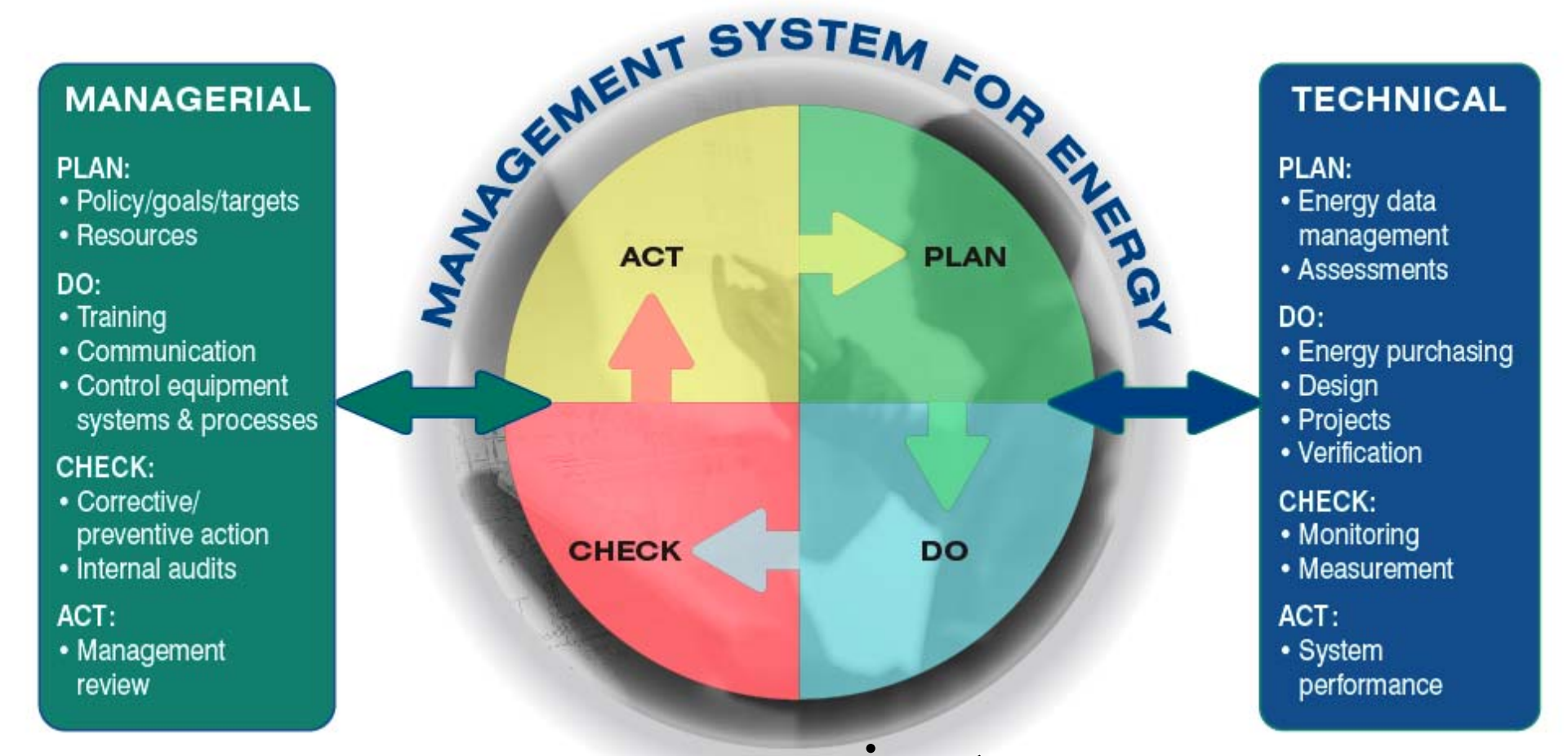
http://innovate.gatech.edu/Default.aspx?tabid=2005

http://www.mse2000.net/Default.aspx?base

- Wisconsin Focus on Energy "Practical Energy Management"

http://www.focusonenergy.com/Business/Education-and-Training/Practical_Energy.aspx

ANSI/ MSE 2000:2008



MANAGERIAL

PLAN:
- Policy/goals/targets
- Resources

DO:
- Training
- Communication
- Control equipment systems & processes

CHECK:
- Corrective/ preventive action
- Internal audits

ACT:
- Management review

TECHNICAL

PLAN:
- Energy data management
- Assessments

DO:
- Energy purchasing
- Design
- Projects
- Verification

CHECK:
- Monitoring
- Measurement

ACT:
- System performance

www.ansi.org

MSE 2000 Recent Developments

Standard Revised for 2008!

- Create broader stakeholder representation on Consensus Board: U.S. Industry, DOE, EPA Energy Star, NIST, Consultants
- Expand Ownership of Potential Users
- Increase Implementation

Energy Management Standards

Current Status

- Several countries already have national energy management standards (Denmark, Ireland, Sweden, US, Thailand, Korea)
- Energy management standards are under development in China, Spain, Brazil, and European Union
- ISO has initiated work on an international energy management standard (2008-2011), with preparatory assistance from the United Nations Industrial Development Organization (UNIDO)

UNIDO Support for ISO EM Standard

- March 2007, United Nations Industrial Development Organization (UNIDO) hosted the first meeting to put forward the idea of an energy management standard
- July- September 2007, initiated a program to foster coordination between developing and developed countries for the development of an international standard for energy management
  - Regional meetings (9/07-Kanchanaburi, Thailand; 8/08-Sao Paulo, Brazil)
  - Conducting a survey of industry and standards authority in several regions to provide input to ISO standard

Beijing Working Group Meeting

April 2008, UNIDO and the Standardization Administration of China (SAC) hosted meeting in Beijing to facilitate harmonization of existing national standards:

- 58 energy management and standards experts from 14 countries participated, including the leadership organizations for PC 242, UNIDO, and ISO Secretariat
- Key Input: Summary Comparison of National Energy Management Standards prepared by Georgia Tech and LBNL as US contribution to the meeting
- Key Output: **UNIDO/SAC Framework for Action**

Key Findings in Framework for Action

- Develop the standard quickly
- Should be broadly applicable to all types of organizations
  - Industrial, commercial, institutional, large residential, and transportation sectors.
  - To maximize the impact of the ISO MSE in emerging economies, the initial implementation focus should be on industry.
  - The role of entities such as government, consultants, designers, equipment suppliers, and educational and financial institutions in affecting implementation will also need to be considered.
- Must be usable by Small and Medium Size Enterprises (SMEs)
- Participation in the standards development process by representatives from developing countries and emerging economies is essential

ISO 50001- Energy Management System

Scope (From the New Work Item Proposal)

Standardization in the field of energy management, including:

- energy supply,
- procurement practices for energy using equipment and systems,
- energy use, and
- any use-related disposal issues.

The standard will also address measurement of current energy usage, and implementation of a measurement system to document, report, and validate continuous improvement in the area of energy management.

ISO Project Committee 242

September 8-10, 2008, 1st PC 242 Meeting in Arlington, VA

- 90 participants from 25 countries from all regions of the world, as well as UNIDO, which has liaison status
- Participating countries have existing activities on energy management and strong interest in developing a harmonized international standard
- Key decision to base standard on the common elements found in all of ISO's management system standards (e.g. 9001, 14001) to ensure maximum compatibility
- Two-year accelerated schedule to have ISO 50001 ready for publication by the end of 2010

ISO/PC 242 MEMBER COUNTRIES

PARTICIPATING (33) and Observing (6) COUNTRIES

- Argentina (IRAM)
- Australia (SA)
- Barbados (BNSI)
- Belgium (NBN)
- Brazil (ABNT)
- Canada (SCC)
- Czech Republic (CNI)
- Chile (INN)
- China (SAC)
- Denmark (DS)
- Ecuador (INEN)
- Finland (SFS)
- France (AFNOR)
- Germany (DIN)
- Ireland (NSAI)
- Israel (SII)
- Italy (UNI)
- Japan (JISC)
- Kazakhstan (KAZMEMST)
- Korea, Republic of (KATS)
- Malaysia (DSM)
- Mauritius (MSB)
- Netherlands (NEN)
- Nigeria (SON)
- Pakistan (PSQCA)
- Poland (PKN)
- Portugal (IPQ)
- Saint Lucia (SLBS)
- Singapore (SPRING SG)
- South Africa (SABS)
- Spain (AENOR)
- Sweden (SIS)
- Switzerland (SNV)
- Thailand (TISI)
- Tunisia (INNORPI)
- Turkey (TSE)
- United Kingdom (BSI)
- USA (ANSI)
- Zimbabwe (SAZ)

US Technical Advisory Group (TAG)

Objectives of the US TAG

- Represents the US through ANSI on ISO PC 242
- To develop the US position at ISO PC 242 International Meetings
- Participation in US TAG is open to all energy management experts.
- See Superior Energy Performance website of how to join US TAG

www.superiorenergyperformance.net

Challenges ahead

- Inertia –ISO 9001 or ISO 14001 conformance offers an advantage
- Management needs to support this approach
- Baseline needs to be established, processes and controls developed
- For some customers this is a new way of managing and evaluating their business
- Infrastructure is not in place to support customers and confirm conformance

Supportive National Policies for EnMS

In all countries with existing standards:

- Energy management standards are voluntary[1]
- Programs target large industrial plants
- Technical assistance is available
- Case studies are used to publicize benefits
- Provide recognition for outstanding performers

1 Mandatory for selected large facilities in Thailand

Supportive National Policies for EnMS

In addition, most countries:

- Offer financial incentives for compliance, usually as part of a target-setting agreement[1]
- Provide training on standards compliance
- Provide opportunities for companies to network and learn from each other
- Several countries also offer system optimization training

1 typically energy or carbon dioxide tax relief

ISO EnMS Standard and EE

- This standard will allow companies to become more competitive nationally and internationally.
  - Improved energy performance
  - Green Marketing
  - Customer demand
- U.S. Stakeholders in Energy Services can use this as an opportunity to market EE programs to their customers

Superior Energy Performance Steering Committee

Collaboration of industry, government, and non-profit organizations

- Seek to improve the energy intensity of U.S. manufacturing through a series of initiatives.
- Guide development of the **Superior Energy Performance** program

National Association of Manufacturers

ANSI Accredited Certification Program

Frito Lay — food for the fun of it!

ipsco — A DIVISION OF SSAB

Cargill

EASTMAN

DOW

Ford

3M

PPG

Save ENERGY Now

SUNOCO

OWENS CORNING

ROHM AND HAAS

Weyerhaeuser

TOYOTA

NIST National Institute of Standards and Technology

energy ENERGY STAR

Superior Energy Performance Program Strategy

- Foster an organizational culture of **continuous improvement** in energy efficiency in U.S. manufacturing facilities
- Develop a **transparent** system to validate energy intensity improvements and management practices
- Create a **verified record** of energy source fuel savings and carbon reductions with potential value in national and international markets

Superior Energy Performance Program Infrastructure

Standards & Protocols

ISO 50001 Energy Management Standard

System Assessment Standards

Measurement & Verification Protocol

Certifying Organizations for Professionals (TBD)

Energy Management Practitioners

System Assessment Practitioners

Certified SEP Program Validators

Participating SEP program Manufacturing Plants

Save Energy Now: A Resource for Success

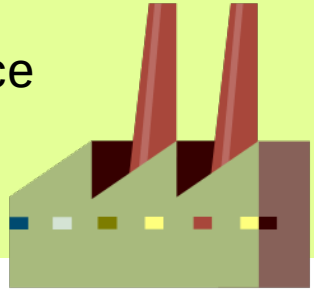
Superior Energy Performance Program

Participants establish energy management system that complies with ISO 50001 and meet other SEP program requirements

***Plant* Assistance**

- Strengthens corporate support for energy management program
- Plant energy management & system optimization tools
- Training and assessments by Certified Practitioners

Helps individual manufacturing plants improve energy management and intensity performance



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To track status of ISO 50001 energy management standard

www.superiorenergyperformance.net