ISO 50001

Energy Management System Overview

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Strategic Energy Management Continuum

- Transition from project to systematic approach
- Many utility SEM programs operate at this level

Foundational Energy Management (e.g., ENERGY STAR For Buildings & Plants)

ISO 50001

- Standard Energy Management System (EnMS) framework for global industrial operations
- Verified energy performance

- ISO standard for Energy Management Systems - EnMS
- Similar framework to ISO 9001 and ISO 14001
- Certifiable EnMS, SEM program
- Verifies measured results – internal credibility
- Rigorous third-party measurement and verification
- External stakeholder recognition of achievement
- Marginal effort beyond ISO 50001
- Rigorous third-party measurement and verification
- External stakeholder recognition of achievement
- Marginal effort beyond ISO 50001

Adopted from DOE/SEP
• An overview of the ISO 50001 requirements
  – Leveraging existing management systems for managing energy and
  – Unique energy management elements - data
• Policy
• Management responsibility
• Energy planning
  • Energy Review
  • Energy Baseline and ENPIs
  • Objectives Targets and Action Plans
Energy Review

- Energy sources
- Energy use and consumption
- Significant energy uses (SEU)
- Prioritized improvement opportunities
“Energy use accounting for substantial energy consumption and/or offering considerable potential for energy performance improvement”
Metrics (EnPIs and Baseline)

• Facility-wide EnPI (SEnPI) –
  – normalized for production and weather
• Process-unit level
  – Product specific
  – Process specific
• Energy System level
  – Compressed Air – kW / 100 cfm
  – Steam systems – MMBtu / 1000 pph
  – Furnace – MMBtu / unit
**Objective:** Reduce facility-wide energy consumption by 25% by 2020.

**Target (1):** By end of CY 2015, reduce electrical energy consumption in production and administrative operations by 2% from 2014 baseline.

- **Action Plan (1)** Compressed air improvements by contractor completed by end of year
- **Action Plan (2)** Upgrade lighting in Admin building to LED with occupancy sensor

**Target (2):** By end of CY 2015, reduce natural gas consumption in production operations by 1% from 2014 baseline.

- **Action Plan (1)** Boiler #3 upgrade in 3rd quarter
Data Driven Decisions

• Consumption and use – understanding of where and how we use energy
• SEU – focus on big users/opportunities and what affects their consumption (production, weather)
• Opportunities – systematically evaluate opportunities to get best outcomes
• Metrics – how to measure performance (EnPI)
• SMART objectives with formal path of how to get there (action plan)
DO

- Training
- Communication
- Documents
- Operational Control
- Design
- Procurement
Operational Control

- Determine and plan operation and maintenance associated with **significant energy uses**
- Set operation and maintenance criteria
- Communication of controls
- Operate according to criteria
Operational Control

- **Procedural Based**
  - Work instructions
  - PM schedules
- **Technology Based**
  - Alarms/alerts
  - Computer automated systems
- **Training Based**
  - Operating training
  - Contractor training

Probably have operational controls in place for your bigger energy uses.
• Measuring, monitoring, and analysis
• Legal requirements
• Internal auditing
• Nonconformance, corrective, preventive
• Records
Monitoring, Measurement and Analysis

- Focus on key characteristics
- Energy measurement plan
- Calibrate equipment
- Respond to significant changes in energy performance
Energy Measurement Plan

- Monitoring and measuring method
- Process or equipment
- Data collection and frequency
- Records storage
- Responsibilities
- Operation Requirements
- Maintenance requirements
- Monitoring equipment and calibration
- Data analysis method
- Signification Deviation and response
• Management review
• Use what you have from other systems – don’t recreate the wheel
• Select energy team and meet frequently
• Requires 2 documented procedures
  – Internal auditing and energy planning
• Do your best effort in energy review but don’t get bogged down
• Use current metrics (EnPIs) if you have them but also consider more specific; normalized with variables (production/weather)
• Start with 2-3 SEUs
• Use Data to make decisions
Demonstrations

• DOE Regional SEP Demos
  – Mid-Atlantic 2010
  – Northeast 2012
• PA Demo 2013
• Cohort of companies trained and implementing
• Three training sessions (P, D, CA)
• Coach for each company
• 18 + months
Thank-you