Industrial Energy Efficiency and Energy Management standards

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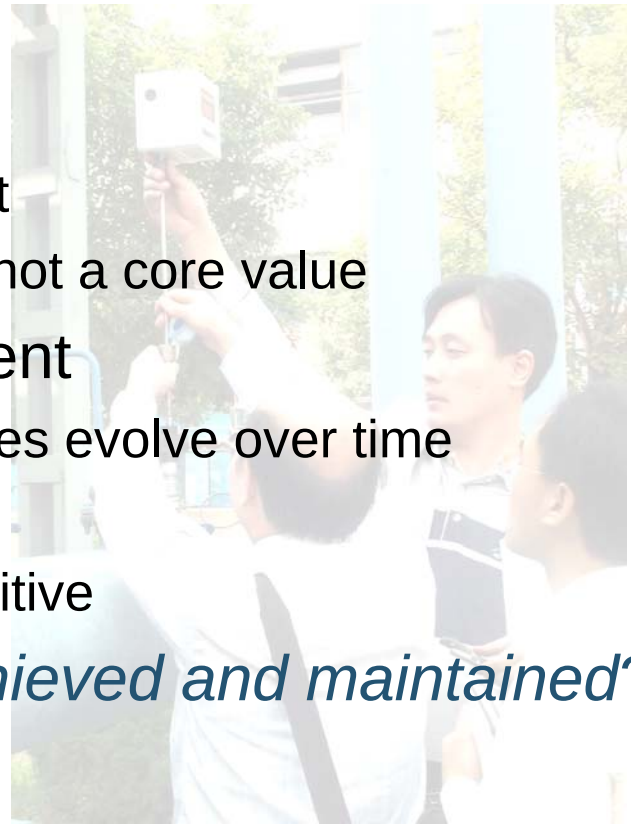
Barriers to energy efficiency

- Resistance to change- both individual and organizational
  - Perceived risk
  - Absence of top-down commitment
  - Not part of the corporate culture- not a core value
- Constantly changing environment
  - Production levels and product types evolve over time
  - Trained people move to new jobs
  - Global markets are highly competitive



How can energy efficiency be achieved and maintained?

Learning from Process Management

Successful industrial processes are also complex and changing, but they are:

- Consistent
- Adaptable
- Resource efficient
- Continually improving

What if industrial energy efficiency were fully integrated into a management system?

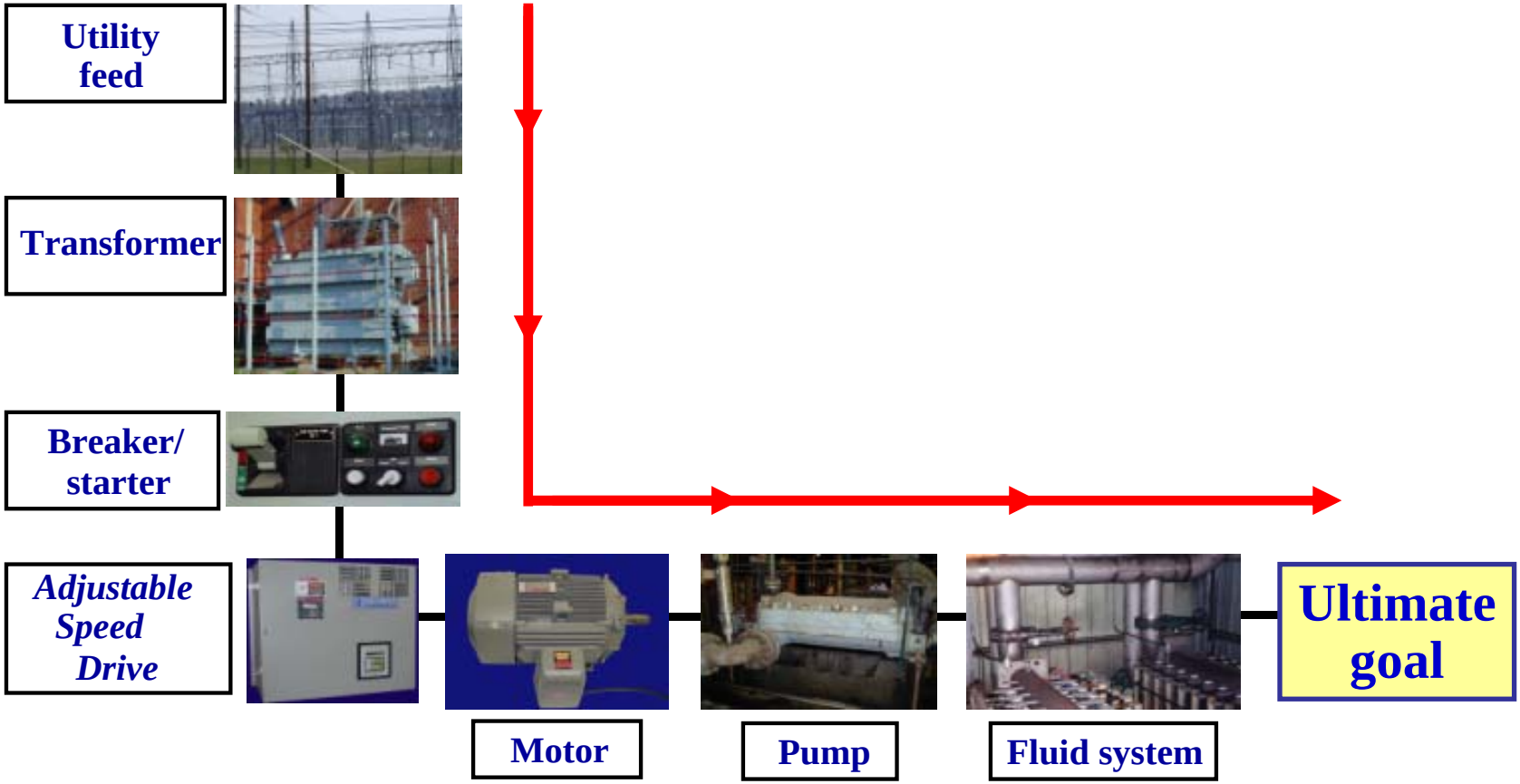
Energy Management Standards

- Most energy efficiency in industry is achieved through changes in *how energy is managed* in an industrial facility, rather than through installation of new technologies;
- An energy management standard provides a method for integrating energy efficiency into existing industrial management systems for continuous improvement;
- Companies who have voluntarily adopted an energy management plan (a central feature of an EM standard) have achieved major energy intensity improvements[2].
- **Would help capture systems-level energy efficiency opportunities.**

1 International Organization for Standardization (ISO)

2 Btu/lb of product

Pump Systems



Courtesy of Don Casada, Diagnostic Solutions and US Department of Energy

Hydraulic System - Motor/Pump/Valve

There is > 28 m pressure drop across the throttled valve

Useful hydraulic power = 2.1 kW

Actual *System* Efficiency is only 13 %

Elements of System Optimization

- Evaluating work requirements
- Matching system supply to these requirements
- Eliminating or reconfiguring inefficient uses and practices (throttling, open blowing, etc)
- Changing out or supplementing existing equipment (motors, fans, pumps, compressors) to better match work requirements and increase operating efficiency

Elements of System Optimization

- Applying sophisticated control strategies and variable speed drives that allow greater flexibility to match supply with demand
- Identifying and correcting maintenance problems
- Upgrading ongoing maintenance practices

Systems Optimization helped by recent advances with Portable, non-intrusive and Accurate Measuring Instrumentation

Current Energy Management Standards

- 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

Components of an EM Standard

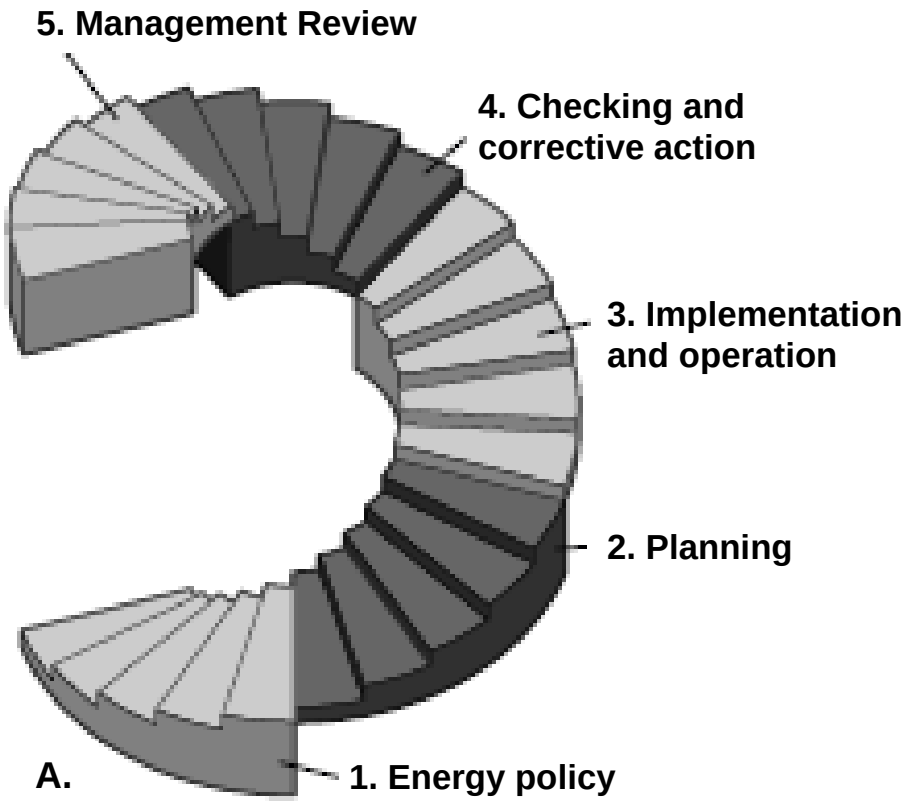
Typical features include:

1. a *strategic plan* that requires measurement, management, and documentation for continuous improvement for energy efficiency;
2. a *cross-divisional management team* led by an energy coordinator 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;

Components of an EM Standard, con't

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

Plan-do-check-act model



Source: Danish DS 2403:2001, Energy Management-Specifications

Industrial Standards Framework

Policy Objective	*Policy Response*	*Market Response*
Establishing National Goals for GHG Reduction	Voluntary or Target-setting Agreements; Tax incentives	Companies commit to energy intensity reduction targets
Capacity Building	System Optimization Training of plant engineers/consultants/ suppliers/ ESCOs	Trained experts conduct plant assessments, sell system services
Integrating Energy Efficient Practices	Energy Management Standard, Guidance, Training	Plants actively manage energy like other resources
Identifying Energy Saving Projects	-Trained System Experts -System Optimization Library -Standardized Assessments	Plant managers use trained experts to identify projects
Implementing Energy Efficiency Projects	Financial incentives, loan guarantees & subsidies, energy efficiency credits, ESCOs	Plants implement more projects, buy system services, accrue credits
Documenting for Sustainability	-Energy Management Plan -System Optimization Library -Measurement & Verification	Energy savings continue through project lifetime & are tradable as credits
Market Recognition	Recognition Programs, Energy Efficiency Credits, Certification	Companies & financial institutions value energy efficiency

ISO 50001Management System for Energy

- Put to the vote of ISO members in November 2007.
- February 2008. ISO Technical Management Board approved formation of ISO Project Committee PC 242.
- Committee secretariat assigned to partnership of ANSI (USA) and ABNT (Brazil). Supported by BSI (UK) and SAC (China)

ISO/PC 242 Standard Development Schedule

- September 2008. First meeting ISO/PC 242 in Washington DC, US.
- September 2008 to March 2009. Development of working drafts.
- April 2009 to June 2009. Voting on Committee draft
- July 2009 to November 2009. Preparation of draft standard based on vote result.
- December 2009 to April 2010. Voting on Draft.
- May 2010 to August 2010. Preparation of final draft standard
- September 2010 to October 2010 Vote on final draft
- End 2010. Publication on ISO 50001 - energy management standard.

Thank you for your attention

- R.williams@unido.org

- http://www.unido.org/index.php?id=o86084
  (proceedings of working group meeting convened to “kick off” process of developing the energy management standard)

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