Energy Management Practices – The Case of UNIDO and IPEEC-EMWG
Energy Management Practices including ESCO program in different countries

The Case of UNIDO and IPEEC-EMWG

Marco Matteini
Industrial Development Officer
UNIDO Energy Branch

Graziella Siciliano
IPEEC-EMWG Coordinator
U.S. Department of Energy

7th EMAK Workshop
ENES 2015, 19-20 November 2015
Moscow
Content

- UNIDO Energy Management System (EnMS) Programme
- How to measure energy performance improvements
- Policies supporting EnMS and ESCOs
- IPEEC Energy Management Working Group
UNIDO Global IEE-EnMS Programme

Operational in 17 countries
Planned activities in 10 countries

Operational
South Africa
Moldova
Russia
Turkey
Ecuador
Malaysia
Thailand
Viet Nam
India

Philippines
Egypt
Indonesia
Iran
Ukraine
Colombia
Macedonia
Myanmar

Planned activities

Other donors
✓ Swiss State Secretariat for Economic Affairs
✓ UK Department for International Development
✓ Government of South Africa
✓ Government of Italy
Why EnMS in Industry?

- Energy efficiency improvements with very favorable payback periods are often missed or do not get implemented due to other priorities.
- Even those that are implemented may not be sustained due to lack of supportive operational/maintenance practices.
- The only constant in the life of most industrial facilities is change of product mix, production, management, personnel.

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

**Solution:** Staff at all levels within an organization need to be engaged in management of energy on an ongoing basis.

*Source: Adapted from A. McKane, 2014*
UNIDO Combining Skills Development & Results

**Legend**

**PE team**
A Partner Enterprise (PE) team is formed by the PE’s staff participating in the EXPERT program plus 1-2 national consultants trainees.

**plant visits by international and national EE-EnMS consultants**

**Ongoing and periodic communication through webinars, emails and phone calls between international trainers and PE teams to review progress, discuss issues and provide guidance.**

---

**USER**
Training

**EXPERT**
Module 1

**Results:**
- Draft Energy Policy
- Draft Roles & Responsibility matrix
- Initial data collection

**1-2 months**

**2 days**

**PE team work to implement EnMS**

**4 days**

**4-6 months**

**3 days**

**4-6 months**

**3 days**

**2-3 months**

**½ day**

**EXAM**

---

**EXPERT**
Module 2

**Results:**
- Energy Policy
- Roles & Responsibility matrix
- Significant Energy Uses
- Baseline
- Energy Performance Indicators
- Opportunities list & action plans
- Energy & cost savings
- Performance improvements

**1.5-2 months**

**4 days**

**PE team work to implement EnMS**

---

**EXPERT**
Module 3

**Results:**
- Staff trained on selected SEUs
- Operations & controls improved
- Procurement plan
- EE measures implemented
- Energy & cost savings
- Performance improvements

**3 days**

**4-6 months**

**3 days**

**2-3 months**

---

**ENMS implemented in PE**

**Results:**
- Energy performance checked, verified and reported
- Energy performance reviewed by top management
- Decisions for next period based on internal audit
- Energy & cost savings
- Performance improvements

**½ day**

**EXAM**

---

**Plant visits by international and national EE-EnMS consultants**
How to measure energy performance

Which is right?

**Energy Consumption**

-16.74 %

**Specific Energy Consumption**

+2.19 %

**CUSUM based on regression model**

-8.94 %

Brewing industry

Source: L. McLaughlin for UNIDO
Measuring EnMS implementation impact

Define the right indicators

- ISO 50006 - Energy Performance Indicators (EnPIs) and Energy Baselines (EnBs)
- Can measure EnMS effectiveness and energy performance improvements due to training, behavioral change & organizational measures
- Can save a lot of energy at no cost

12 variables (CDD0 and different production parameters)

R²: 0.92
### Importance of Programmatic Context for EnMS

<table>
<thead>
<tr>
<th></th>
<th>Voluntary or Mandatory Standard</th>
<th>Financial incentives for Compliance</th>
<th>Penalties for Non-Compliance</th>
<th>Recognition Program</th>
<th>Linked to Voluntary Agreement</th>
<th>Training Available</th>
<th>Standard Compliance Requirement</th>
<th>Reporting to Public</th>
<th>Industrial Systems Training Available</th>
<th>Market Penetration by Industrial Energy Use</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Denmark</strong></td>
<td>Vol</td>
<td>Yes*</td>
<td>Yes*</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Lim 60%</td>
</tr>
<tr>
<td><strong>Ireland</strong></td>
<td>Vol</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>25%</td>
</tr>
<tr>
<td><strong>Sweden</strong></td>
<td>Vol</td>
<td>Yes**</td>
<td>Yes**</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>50%e</td>
<td></td>
</tr>
<tr>
<td><strong>United States</strong></td>
<td>Vol</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>&lt;5%</td>
</tr>
</tbody>
</table>

* Denmark has had a CO2 tax since 1992 that affects larger industries. Tax relief is linked to participation in a voluntary agreement.  
** Sweden has had a CO2 tax since 1/2005. Tax relief for process-related electricity linked to participation in a voluntary agreement.  
*** Ireland plans to expand training offerings.
Policies supporting EnMS and ESCOs

The Danish Energy Efficiency Obligation (EEO) Scheme

- EEOs are unique in how they drive savings
  - Overall target set, obligated parties can determine the most cost-effective options
  - Flexibility to work with third parties to deliver savings
  - Guarantee a steady stream of funding (to cover a % of the cost of EE measures). Independent of changes to government budgets
  - Those who pay also benefit
    - Benefits of targeted energy savings accrue to all end-users
    - Beneficiaries of funds from obligations save twice: directly through energy savings, and indirectly through “system benefits”

- Danish EEO experience
  - EnMS implementation included between eligible measures under the EEO scheme
  - Largest share of energy savings achieved in the industrial sector
Policies supporting EnMS and ESCOs

EEO Scheme triggered development of EE service market

Danish Energy Association Experience

- We see an increasing bundling of selling energy and delivering energy efficiency services in partnership with installers and others
- Retailers are developing niche markets focusing on:
  - Energy savings in public buildings
  - Climate Partnership with a strong CSR element,
  - ESCO projects and energy performance contracting etc.
- The cost recovery element is crucial in order to remove risk for kick starting the energy service market
- Energy efficiency is more about innovation in business models and approaching the customer than new technologies

Source: Ulrich Bang, DanskEnergi
The EMWG leverages the extensive expertise of its 12 member governments to accelerate the adoption and use of energy management systems such as ISO 50001 in industry and in commercial buildings worldwide.

**Fora:** The EMWG (formerly known as GSEP EMWG) is an initiative of the Clean Energy Ministerial and the International Partnership for Energy Efficiency Cooperation (IPEEC). The EMWG also reports out to the G20, through their Energy Efficiency Action Plan.

**Partners:** The EMWG partners with UNIDO and other organizations promoting energy efficiency and energy management (e.g., International Organization for Standardization, Institute for Industrial Productivity, etc.).


CURRENT EMWG ACTIVITIES

Build the Business Case
- EnMS Case Studies

Supportive Programs and Policies
- ISO 50001 Auditor Certification

Provide Support and Resources
- EnMS Toolbox
- Measurement and Verification Resources

Private Sector Engagement
- ISO 50001 Collaborative
- Energy Management Leadership Awards

www.cleanenergyministerial.org/energymanagement
ISO 50001 COLLABORATIVE

ISO 50001 is a key strategy for fighting climate change.

- The EMWG seeks to increase multilateral and private-sector engagement on ISO 50001, expand support from governments, and enhance impacts of ISO 50001 implementation.
  - Joining the Industry Energy Efficiency Action Pledge
  - Recognizing Corporate Leadership: Energy Management Leadership Awards
  - Facilitate Ongoing Industry Dialogue on ISO 50001
  - Develop Areas of Technical Cooperation
ISO 50001 COLLABORATIVE STATUS

• The **ISO 50001 Impact Estimator Tool** is available to help countries define their own potentials from use of the standard (download at www.cleanenergyministerial.org/energymanagement)

• Planning is underway 21st Conference of Parties (COP21) in Paris, Dec. 2015:
  – The CEM is planning an ISO 50001-focused announcement during Action Day featuring ministers and CEOs who are committing to advancing implementation of the ISO 50001 standard.
  – CEM, IPEEC, and other partners will recruit companies to sign the Industry Energy Efficiency Action Pledge.

• CEM7 in San Francisco Bay Area, mid-2016
  – ISO 50001 private sector leaders will be invited to CEM7 sessions.
  – Highlights of private sector and government commitments and accomplishments on ISO 50001.
ENMS CASE STUDIES

- Showcase EnMS early adopters; many feature ISO 50001 use
- Companies share EnMS insights, costs and resulting savings, payback, lessons learned, tips, and more
- 18 case studies available to date, including case studies from partners
- Library of case studies, can search by keyword and filter results by industry, country, and by date published

www.cleanenergyministerial.org/energymanagement, see case studies link in left navigation
ENERGY MANAGEMENT LEADERSHIP AWARDS

Global Leadership and Case Study Awards Program

Goals:

• Raise profile of energy management systems (EnMS) such as ISO 50001 as a broadly-applicable solution with proven, successful outcomes

• Showcase leading companies that have used EnMS such as ISO 50001, document their path to success to guide others

Benefits

• Accelerate EnMS uptake to meet national and global climate goals.
• Build a compelling business case based on real-world data and experience.
• Gather insights to enhance national and international programs.
• Reinforce the value of robust implementation and measurable results.
The effectiveness and impact of ISO 50001 standards (including the new ISO 50003 supporting standard published in 2014) requires auditors with experience in management systems and energy efficiency, but this is not well-supported by current professional credentials and training.

EMWG partners have designed the Energy Professionals International (EPI) ISO 50001 Lead Auditor Certification Scheme and International Exam as a strategy to make sure ISO 50003 is implemented successfully and transparently in their countries.

**Elements of Certification Scheme***
- Scope for ISO 50001 Lead Auditor
- Job Task Analysis
- Blueprint
- Education and experience requirements
- Any prerequisites

**Implementation Principles**
- Guide use of the Certification Scheme for each participating country
- Maintain consistency of outcomes
- Prepare countries to meet requirements of ISO/IEC 17024 accreditation

**Partners:** Canada, Chile, Mexico, Republic of Korea, South Africa, United States, and UNIDO.
GET INVOLVED!

• Expand engagement between governments and the private sector through the ISO 50001 Collaborative to position ISO 50001 as a key pathway for meeting national and international climate and energy goals
• Share EMWG EnMS case studies with companies to promote the benefits of EnMS and ISO 50001
• Encourage companies with ISO 50001 certification to create case studies and submit entries for international recognition through the CEM Energy Management Leadership Awards.
• Encourage your personnel certification bodies to adopt the ISO 50001 Lead Auditor Certification Scheme and International Exam to build workforce skill and capacity for ISO 50001 audits.

Contact: Graziella Siciliano, EMWG Coordinator – Clean Energy Ministerial, U.S. Department of Energy, graziella.siciliano@hq.doe.gov

For more information about EMWG and its activities, visit: www.cleanenergyministerial.org/energymanagement
Thank you for your attention

For more information about UNIDO’s IEE-EnMS work:

Marco Matteini
Industrial Energy Efficiency Unit
Energy Branch
UNIDO
Vienna International Centre
P.O. Box 300
A-1400 Vienna, Austria
E-mail: M.Matteini@unido.org

For more information about IPEEC-EMWG’s work:

Graziella Siciliano
EMWG Coordinator
Clean Energy Ministerial
U.S. Department of Energy
E-mail: graziella.siciliano@hq.doe.gov