UNIDO Programme on EnMS and ISO 50001 in Industry
UNIDO Programme on Energy Management System and ISO 50001 in Industry
UNIDO is a specialised agency in the United Nations System, which has the following mandate:

- Promote & support Inclusive & Sustainable Industrial Development (ISID) in developing countries and transition economies;

In the past years, UNIDO has taken an active role in the global development agenda focusing its activities on three thematic priorities:

- Poverty reduction through productive activities
- Trade Capacity Building
- Energy and Environment
Programme Context

✓ Industry is the single largest source of GHG emissions, accounting for about 32% of global emissions
✓ Industry accounts for ~ 1/3 of global energy use
✓ Industrial energy use is projected to increase by 37% by 2035 (2013 base) in the New Policies Scenario
✓ Growth arises especially in non-energy intensive sectors and in non-OECD countries
✓ Estimated economic EE potential in industry is 25-30%, with existing best-available practices and technologies

Source: IPPC Working Group III – Mitigation of Climate Change, 2014
Most emissions reductions possible through deployment of existing best available practices and technologies

Source: IEA/UNIDO 2010
Work together with counterparts, stakeholders and partners to:

- **Strengthen policy** and regulatory frameworks for better and sustainable energy efficient performance in industry
- **Accelerate adoption** and wide dissemination of IEE best-available practices and technologies
- **Save energy** and reduce GHG emission of the industrial sector
- **Integrate EE** in industry daily business practices
Sustainable Industrial Energy Efficiency

Energy Management Systems (EnMS)  || Energy System Optimization (ESO)

- Auxiliary energy systems account for over 50% of final manufacturing energy consumption
- System optimization average efficiency gains range between 15-30% against 4-5% of individual components
UNIDO EnMS-ISO 50001 Global Programme
As of December 2015

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

Other donors
✓ Swiss State Secretariat for Economic Affairs
✓ UK Department for International Development
✓ Government of South Africa
✓ Government of Italy
## Importance of Programmatic Context for EnMS

<table>
<thead>
<tr>
<th></th>
<th>Voluntary or Mandatory Standard</th>
<th>Financial Incentives for Compliance Available</th>
<th>Technical Assistance Available</th>
<th>Penalties for Non-Compliance</th>
<th>Recognition of Program</th>
<th>Linked to Voluntary Agreement</th>
<th>Training Available on Standard Compliance</th>
<th>Reporting to Public Entity Required</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>Yes</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>50%e</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>No</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

*Source: A. McKane for UNIDO, 2007*
Combining Skills Development with 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.

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

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

**Preparation**

- **USER Training**
  - PE team work to implement EnMS

**EXPERT Module 1**

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

**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

**EXPERT Module 3**

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

**EXAM**

- 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

Inclusive and Sustainable Industrial Development
UNIDO-GEF Russia IEE-EnMS Project

Baltika Breweries

commit to change

Check the results

Plan the changes

Make the changes

kWh ↓

(€ + CO2)

Savings in million Rubles from September 2014 to February 2015 achieved WITHOUT capital investments

<table>
<thead>
<tr>
<th></th>
<th>Plant 1</th>
<th>Plant 2</th>
<th>Plant 3</th>
<th>Plant 4</th>
<th>Plant 5</th>
<th>Plant 6</th>
<th>Plant 7</th>
<th>Plant 8</th>
<th>Sub-Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water</td>
<td>-1,7</td>
<td>-0,8</td>
<td>-0,4</td>
<td>-1,1</td>
<td>-1,2</td>
<td>-0,1</td>
<td>-0,8</td>
<td>-0,1</td>
<td>-6,2</td>
</tr>
<tr>
<td>Electricity</td>
<td>-0,8</td>
<td>-2,2</td>
<td>-4,7</td>
<td>-3,2</td>
<td>0,4</td>
<td>-1,7</td>
<td>-2,2</td>
<td>0,7</td>
<td>-13,6</td>
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<tr>
<td>Heat</td>
<td>0,0</td>
<td>-0,2</td>
<td>0,0</td>
<td>-2,0</td>
<td>3,0</td>
<td>-5,3</td>
<td>-1,4</td>
<td>1,7</td>
<td>-4,3</td>
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<tr>
<td>Total (RUB)</td>
<td>-2,6</td>
<td>-3,1</td>
<td>-5,2</td>
<td>-6,3</td>
<td>2,3</td>
<td>-7,2</td>
<td>-4,4</td>
<td>2,3</td>
<td>-24,1</td>
</tr>
</tbody>
</table>
UNIDO South Africa IEE-EnMS Project

**Arcelormittal Saldanha Works**

- Electricity demand: 160 MW
- Manpower: 548 permanent employees
- Sales output: 1,2 million ton HRC/annum

Adjustments/optimization of production operation, energy systems optimization, fuels switching, etc..... driven by EnMS!

**Energy Efficiency Achievements 2011**

- Energy Management System Implemented
- No. of Projects/Measures: 11
- Total Capital Investment (USD): 0
- 2011 Gross Financial Savings (USD): 9,076,000
- Overall Payback Period (in years): 0
- 2011 Energy Savings (GWh): 79.95

**Energy Savings 2011-2014**

460 GWh
Energy savings achieved (without capital investments) by Arcelormittal Saldanha Works during the first year of EnMS implementation were about 80 GWh. This amount of energy is equivalent to:

- Annual energy consumption of 13,300 EU households
- Annual energy production of a 25 MW wind farm
- CO2 emissions of 20,000 middle class cars (running 12,500 km per year)
UNIDO-GEF Moldova IEE-EnMS Project

LACTIS J.S.C

- Open joint stock company (about 10% on Moldovan market)
- 185 employees
- Management started to look into EE in 2009 to reduce production costs and impact of increased energy prices

Value of EnMS/EE investments planned in 2012 for 2013-2014 was 410,000 USD

80% implemented

LACTIS improvements 2011-2012

<table>
<thead>
<tr>
<th>Energy Management System Implemented</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of Measures/Projects</td>
<td>11</td>
</tr>
<tr>
<td>Total Capital Investment (USD)</td>
<td>6,900</td>
</tr>
<tr>
<td>Gross Monetary Savings (USD)</td>
<td>22,000</td>
</tr>
<tr>
<td>Overall Payback Period (in years)</td>
<td>0.32</td>
</tr>
<tr>
<td>Annual Energy Savings (MWh)</td>
<td>328</td>
</tr>
<tr>
<td>2011 GHG Reductions (tons CO₂)</td>
<td>160</td>
</tr>
</tbody>
</table>
UNIDO EnMS-ISO 50001 Programme - Some Results

- Average organization-wide energy savings in first year of EnMS implementation of 5-15%
- More than 4 TWh of direct energy savings in 4 years
- Multiple non-energy benefits including waste reduction, increased productivity and quality gains, innovation and job creation

Decision-makers reached
Enterprises trained on EnMS
EnMS Experts trained
Enterprises with EnMS
Funding mobilized

2008
2012
2014
Average organization-wide energy savings in first year of EnMS implementation of 5-15%
More than 4 TWh of direct energy savings in 4 years
Multiple non-energy benefits including waste reduction, increased productivity and quality gains, innovation and job creation
Achieving impact and market credibility

ISO 50001’s success in delivering expected benefits and impact to organizations and countries will depend on:

1. The availability of competent professionals to guide and assist organizations in implementation

2. Credible demonstration to organizations and market of the tangible benefits of EnMS/ISO50001

3. The level of policy support granted or regulation attached to the implementation EnMS/ISO50001.

UNIDO WORK CONTINUES AT ALL LEVELS!
Thank you for your attention

For more information

Email: EnergyManagement@unido.org