IEE Newsletter

The Industrial Energy Efficiency Project (IEE)

Issue 09 Oct. - Dec. 2015

UNITED NATIONS
INDUSTRIAL DEVELOPMENT ORGANIZATION

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Keeping Energy Management Systems on Track

Energy efficiency is central to ongoing efforts to tackle climate change. Improving energy efficiency will not only help to curb the greenhouse gas emissions that lead to global warming but will also improve energy security by reducing demand for fossil fuels.

In industry, which remains a major contributor to worldwide emissions, Energy Management Systems (EnMS) are vital to companies' abilities to implement and measure efficiency improvements. Therefore, it is important that these systems work effectively.

One way of ensuring this is through internal audits that assess whether the management system meets the requirements of ISO 50001. Over the past two years, UNIDO's Industrial Energy Efficiency (IEE) project has helped 17 companies to carry out EnMS internal audits to ensure that they are ISO 50001 compliant. Over the last three years, the IEE project also provided training to national experts so that they could conduct effective EnMS audits independently and would then be able to transfer their knowledge to partner enterprises.

Helping companies to carry out successful internal audits before they go through the process of a third party audit by an accreditation body has made the final certification process much easier. It has also served to improve understanding within company energy teams of the auditing process and of ISO requirements.

The ISO standard 50001, released in 2011, specifies the requirements for establishing, implementing, maintaining and improving an EnMS, enabling organizations to follow a systematic approach in achieving continual improvement of energy performance, including energy efficiency, energy security, energy use and consumption. The standard aims to help organizations to continually reduce their energy use, and therefore their energy costs and their GHG emissions.

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Benchmarking for Policy Making

A major aim of the IEE project has been to provide as broad a picture of energy efficiency as possible through benchmarking energy consumption in three energy-intensive sectors. As a result of the work completed in early 2015 in the fertilizer, cement and iron and steel sectors, for the first time Egypt has reliable and verifiable figures on energy consumption that can be used by policy makers.

In close cooperation with the Industrial Development Authority (IDA) and under the supervision of the Austrian Energy Agency, UNIDO experts first-handedly collected data for three consecutive years from 2011 to 2013 on energy consumption, production levels, energy management and production practices from participating industries.

Energy Consumption in Egypt

The industrial sector currently accounts for around 43% of all national energy consumption. Reducing this figure will be crucial to efforts to mitigate climate change and to address Egypt's ongoing energy crisis, driven by rising demand and falling supply, in particular a fall in gas production. Egypt has therefore made the efficient use of energy resources one of the main priorities of its 2030 Sustainable Development Strategy. Through efficiency measures, energy-intensive industries can reduce energy consumption by up to 20% by taking measures to raise energy efficiency. Implementing such changes often require little or no investment, making energy efficiency one of the most cost-effective ways to reduce overall energy bills.

Benchmarking Aims

By comparing the performance of individual plants, the benchmarking studies:

- recognize best practice
- assess performance against local sector competitors
- assess performance against international competitors

The benchmarking is not limited to data collection and analysis, but includes the development of benchmarking curves and generates future projections based on different scenarios, which forecast the potential energy requirements and consumption of the sectors based on energy efficiency measures adopted. These forecasts are critical for policy making as well as for the formulation of technical support programmes, as they provide a foundation for moving industries towards more energy-efficient practices.

The Way Forward

The benchmarking study is expected to support decision makers when adopting new policies on industrial energy efficiency. It will also contribute to international competitiveness and play a critical role in the development of road maps to help guide improved energy efficiency measures in all three sectors. Only through combined efforts to develop policies with the support of all stakeholders such as decision makers and factory owners, can Egypt's energy shift from crisis to efficiency.

Methodology

At the planning stage, the IEE project was careful to tailor UNIDO's benchmarking methodology to the Egyptian context and define the scope and system boundaries of the research. The data collection process was carried out in cooperation with the IDA, which provided UNIDO experts with national statistics. Moreover, surveys, sessions and meetings were carried out with 26 participating plants, which worked with UNIDO experts on collecting data over the three years. The plants were closely involved in the verification of the data to ensure homogeneity and accuracy of results. UNIDO experts and consultants analyzed the results, calculated potential savings for the participating plants, made necessary statistical adjustments, and applied other correction factors to make sure results were correct.

Benchmarking Facts and Figures

Sector	Number of Plants Analyzed	Total Sector Energy Saving Potential
Cement	11	52 PJ/a
Fertilizer	5	36.5 PJ/a
Iron and Steel	8	11 PJ/a

Based on the scenario where the whole sector reaches Best Available Technology (BAT) performance levels by the year 2050

Sustainability

The IDA is responsible for the implementation of industrial policies and will be actively involved in the application and practice of the benchmarking results. The Egyptian National Cleaner Production Center (ENCPC), a Ministry of Trade and Industry agency, aims to carry out similar benchmarking studies beyond these three sectors, starting with ceramics. ENCPC staff have received training on UNIDO methodology from national experts who participated in the benchmarking for other sectors, and who will also be involved in managing the implementation of the study.

Factory Owners and Decision Makers

One of the participating plant representatives said: "The benchmarking has rung the bell and given us a wake-up call. We are 10-50% below international best practices in energy consumption and yet we use the same technology, which makes no sense. We need to practice efficiency."

Results

The results of the benchmarking across Egypt's industrial sector indicate that the best performing companies require very little improvement to match internationals standards on energy efficiency, although at the lower end there is considerable room for improvement.

Institutionalizing Benchmarking Methodology and Knowledge

In October, the IEE project organized two benchmarking capacity-building sessions for Egyptian National Cleaner Production Center (ENCPC) and Industrial Development Authority (IDA) staff. The aim was to bring the representatives up to speed on existing methods of energy benchmarking, enabling them to then extend this knowledge throughout their respective government agencies. The training was followed by building on-the-job experience in data collection from a representative sample of the ceramics industry in Egypt in order to develop an energy benchmarking report for the sector. The two organizations (i.e. ENCPC and IDA) were selected by the Ministry of Trade and Industry to be responsible for energy benchmarking activities in order to ensure the sustainability of this activity following the completion of the IEE project.

To date, the IEE project has published three energy benchmarking reports for three energy intensive industries: fertilizers, cement and iron and steel.

Motor System Optimization (MSO) Training

More than 300 million motors are used in industry, large buildings and in infrastructure globally, and 30 million new electric motors are sold each year for industrial purposes alone. Electric motor driven systems (EMDSs) in industry are estimated to be responsible for about 29% of overall global, and 69% of industrial electricity consumption. Their energy costs are estimated to be USD 362 billion per year. By using existing technologies and practices, the efficiency of industrial EMDSs can be cost-effectively improved on average between 20 and 30%. Such improvement holds the potential to reduce global electricity consumption by 3.2 to 4.8 EJ, cut the CO2 emissions by 770 – 1100 Mt, and save the industry between USD 72 – 108 billion, annually.

It is obvious that Motor System Optimization (MSO) is of vital importance to the industrial sector in Egypt and can save enterprises a huge amount of energy. Thus the IEE project in Egypt organized MSO training from the 7th to the 12th November 2015 at SIDPEC company in Alexandria. The training was carried out by UNIDO's international MSO experts. Topics discussed during the training included proven approaches aimed at optimizing motor system performance and energy efficiency such as having motor systems management plan, motor sizing and high-efficiency motors technologies, applications of adjustable speed drives, and preventative maintenance schemes amongst other related topics.

Second Group of Egyptian EnMS Experts Receive Certificates

At the Fifth IEE Project Steering Committee (PSC) meeting, held on 26 October, the second group of national experts trained within the IEE project received their qualification certificates.

The presentation came at the end of a year of training which involved both classroom learning and experience on the job. The trainees were carefully selected from both the public and private sector to represent a diverse range of skills, ensuring that the technical capacity of the newly trained experts would be used throughout the whole value chain.

The evaluation of the experts involved a combination of in-training assessment and engagement, a detailed report on their on-the-job experience and a final exam on EnMS concepts and techniques.

During the PSC meeting, participants also discussed aspects of the policy report and gave an overview of progress on the project to date.

Celebrating UN Day

The Great Pyramid of Giza and the Sphinx were lit up blue as part of worldwide celebrations to mark the 70th anniversary of the United Nations on 24 October.

“We are pleased to partner with the UN and to light up the pyramids of Giza and the Sphinx with the blue colour of the UN," said Egypt's Foreign Minister Sameh Shokry. “Participating in this campaign gives Egypt a unique opportunity to highlight our commitment to the UN’s principles of dignity and prosperity for all,” he added.

Celebrations organized by the Ministry of Foreign Affairs in cooperation with the UN were held at the El-Gezira Youth Club in Zamalek.

The IEE project took part in the celebrations to raise awareness of the potential of industrial energy efficiency and EnMS as drivers for sustainable and inclusive economic development. In addition, the IEE team presented some of the project’s success stories and achievements during the day.

Also on UN Day, in Aswan, the "Sailing the Nile for the Millennium Development Goal (MDG)" initiative was launched with a focus on seventh MDG addressing Environmental Sustainability.

IEE Project Supports ASEC Cement on EnMS for their Clients

UNIDO’s IEE project has teamed up with leading regional cement, engineering and construction company ASEC Cement to provide ASEC clients with the support needed to implement EnMS at their production facilities.

The IEE project organized a half-day training session for ASEC top management to raise awareness at the highest level. As part of an integrated approach to building knowledge, this session was followed by two days of training for ASEC staff on the implementation of EnMS.

ASEC Cement operates seven plants across Egypt. The company was created in 2005 by Citadel Capital, now Qalaa Holdings SAE., a leading private equity company operating in the Middle East and North Africa.