Energy Efficiency in Industries

Introduction

Being an insular country with limited indigenous energy resources and the intermittency of available renewable energy resources, Mauritius relies much on fossil fuel for its energy needs.

Higher cost of imported fuels impacts directly on operations of industries. The need for optimising on use of energy resources by industries and other enterprises is vital to reduce cost and enhance competitiveness. On the other hand, sustainable development calls for the adoption of energy efficient practices that will mitigate the adverse impact of greenhouse gas emissions on the environment.

The Ministry of Energy & Public Utilites, through the United Nations Development Programme (UNDP), has acquired in 2012 a grant from the Alliance of Small Island States (AOSIS/SIDSDOCK) to support the implementation of the project entitled “Removal of Barriers to Energy Efficiency and Energy Conservation in Buildings” with its scope enlarged to include Industry, hence a revisit of the project title to “Removal of Barriers to Energy Efficiency and Energy Conservation in Buildings and in Industry”.

The specific project “Setting up of a framework for energy efficiency and energy conservation in Industries in Mauritius” was implemented by the Ministry of Energy and Public Utilities, with the support of the Ministry of Industry, Commerce & Consumer Protection.

Main Achievements

The broad objective of the project component “Setting up of a framework for energy efficiency and energy conservation in Industries in Mauritius” was to foster a culture of energy efficiency and energy saving practices amongst industries in Mauritius, in line with the overall vision of Government to place sustainable development at the core of its development strategy and also in line with the concept of Maurice Ile Durable (MID). More specifically, it aimed at the development of appropriate energy audit tools and capacity-building for enhanced energy efficiency in the industrial sector.

The project component started in November 2012 and ended in July 2013. The main outcomes and final deliverables were as follows:

- guidelines on energy auditing of industrial energy systems and processes;
- a Code of Good Practice in industrial energy management;
- an Energy Audit Software Tool for industrial energy systems and processes;
- training of a batch of 50 trainees in energy auditing of industrial energy systems and processes;
- training of a batch of 40 trainees in industrial energy management; and
- energy audit of 5 energy-intensive local industries.
Training Sessions

The training comprised of both theoretical and practical training sessions in industrial energy auditing and energy management.

For the practical training sessions, the following five energy-intensive industries were chosen as the host sites:

1. RT Knits Ltd at Pointe Aux Sables;
2. Star Knitwear Group Ltd at Coromandel;
3. Princes Tuna (Mauritius) Ltd at Riche-Terre;
4. Consolidated Fabrics Ltd at Solitude; and
5. FM Denim Ltd at Pointe Aux Sables.

The 50 trainees were grouped into batches of 10, and each group of 10 trainees was posted to one of the 5 host industrial sites.

As part of their practical training, the trainees had to undertake energy audits of the 5 industrial sites, with the guidance and mentoring of a Consultant. Ultimately, the trainees produced 2 energy audit reports for each industrial site.

Industrial Energy Audit Software Tool

An industrial energy audit software tool, called the "Mauritius Industrial Energy Saving Assessment Tool" was developed under the project.

This audit tool is intended to be used by qualified persons who are capable of undertaking energy audits of industrial energy systems and processes for audit purposes for estimating possible energy saving opportunities.

The audit tool has been designed and customized for local climatic conditions and intended and recommended for use ONLY in the Republic of Mauritius.

The audit tool comprises of two parts:

- simple calculators for estimating opportunities; and
- a database for recording and editing identified opportunities.

The diagram below shows a generic workflow for this audit tool.
As can be seen, the workflow consists mainly of the following 4 steps:

**Step 1: Define**  This consist of entering the annual energy data in the Annual Data Section of the tool

**Step 2: Measure** The Technology Calculators help to estimate the energy saving potential for a number of energy saving options

**Step 3: Manage** Here one can manage (review, edit, add, remove) the opportunities in the Opportunity Database

**Step 4: Analyse** Finally, with the use of Pie Charts and Trend Graphs, the energy consumption and performance can be analysed.

The audit tool is available for free. Any requests should be made to the EEMO on eemo@mail.gov.mu

**Industrial Energy Audit Guidebook**

The guidebook is intended as a self-help for use by personnel in industrial facilities in Mauritius in the assessment of energy saving opportunities. It is intended to be used in conjunction with the audit tool.

**Code of Good Practice in Industrial Energy Management**

A Code of Good Practice in Industrial Energy Management has been developed under the project. It contains guidance aimed at those responsible for energy management in an organization, from Board level to operational staff.

A step-by-step approach to energy management is explained in the Code. This approach is in line with the modern management philosophy of continuous improvement and is compatible with the recently introduced international energy management standard (EnMS) published in June 2011 –ISO 50001-2011.

Like all the modern management standards, the Code has the PDCA approach as its underlying philosophy. This approach is used, together with a matrix tool, to show how to underpin the implementation of energy management initiatives within an organization. The matrix is a Board level tool that helps a company position itself in terms of:

- Energy Management;
- Financial Management; and
- Awareness and Information.

In addition, the Code:

- examines how data from sources such as energy audits and monitoring and targeting can underpin energy management
• addresses operational performance and discusses how information is needed to adequately assess the energy performance.
• introduces the new International Energy Management Standard ISO 50001:2011 and explains its contribution to an auditable energy management programme; and
• gives advice on how to run successful staff awareness campaigns and training initiatives.

The Code for Good Practice in Energy Management for Industry is complementary to the document “Guidebook for energy auditing in industry”. The results of any energy audit should feed into an energy management system to maximize their effect.

Feedback

We hope that the audit tool and other supporting documents will prove useful to you in carrying out energy audits in industries.

We welcome any feedback on eemo@mail.gov.mu