

Industrial Energy Efficiency Project

In order to introduce a structured approach to energy management in their operations, Arabian Cement Company (ACC) has joined hands with the GEF funded project, "Industrial Energy Efficiency in Egypt." This project is implemented by the UNIDO in partnership with the Egyptian Environmental Affairs Agency, Ministry of Industry, Trade and SMEs and the Federation of Egyptian Industries. The project has helped ACC to implement an Energy Management System in alignment with ISO 50001 for an overall improvement in energy efficiency and improve environmental impact.

EGYPT

A Case Study of ACC

ACC Snapshot

Industry: Cement

Location: Suez,
Egypt

Product: Cement

EnMS scope:

Thermal and
Electrical Energy

Annual energy savings: ~94.6 GWh

Financial savings: ~20M EGP

GHG reduction: ~214 kCO₂eq / 10 yrs

Objectives period: 3 years

Time to implement EnMS: 18 months

Arabian Cement Company (ACC) was first established in 1997 by a group of Egyptian entrepreneurs, who aspired to establish a leading Egyptian cement company. ACC cement plant is located in Suez Governorate- Egypt. It has an annual cement production capacity of five million tons. The company was listed on the Egyptian stock exchange on May 2014.



Implementing EnMS in Egypt is the way out

ACC are one of the most committed companies in Egypt towards sustainable development. That was demonstrated by their continuous adoption of management systems such as ISO 9001, BS OHSAS 18001 and ISO 14001. These efforts were crowned by the adoption of an EnMS in compliance with ISO 50001 that was certified by an international accreditation body in 2016. Beyond certification, internal and external audits are performed, along with frequent management reviews to ensure the continuing suitability, adequacy and effectiveness of the implemented EnMS. The results and outcomes are reported directly to the top management to take prompt decisions and actions when needed.

ACC ambitious EnMS objectives

ACC assigned its EnMS objectives by applying energy efficiency measures in order to improve facility-wide energy performance. ACC objective is to reduce 6.8% of their electrical and 3.2 % of their thermal energy consumptions by EOY 2017.

UNIDO, a key player in the plant's success

With UNIDO's support, ACC staff were engaged in a thorough process to review and analyze the company's historic energy consumption and performance. ACC have developed their energy policy, defined the EnMS scope and boundaries and carried out a thorough energy review. In addition, ACC have focused on the setting of an ambitious short-term objective to be achieved in by EOY 2015. Furthermore, ACC have given a special focus on increasing awareness on their energy management policy.



Saving opportunities achieved

Implemented Energy Saving Opportunities
Compressed Air Optimization
Lighting System Optimization
Optimization of cement mills operation parameters
Hot disc installation
Totals
Identified Energy Saving Opportunities*
Implementation of 10 golden rules for energy consumption mastery
Implementation of new kiln operational parameters to optimize thermal balance
Utilization of lost energy through waste heat recovery
Installation of bypass recycling system at cement mills
Replacement of existing air lifts by bucket elevators to reduce kiln power consumption
Totals
<i>* To be implemented through the three years objective period</i>

Compressed Air System Optimization

The compressed air system power consumption was reduced by integrating the existing compressed air networks into a single centralized network. All existing compressors have been connected to a central control unit to ensure the optimization of serving demand with a minimal energy consumption. In addition, ACC have installed new VSDs to the existing motors.

Lighting System Optimization

In order to optimize the lighting system energy consumption, ACC have changed their lighting control system from the use of photocells to the use of lighting control relays. This has provided a stronger control based on functional requirements. The installation of lighting control relays has also indirect benefits of reducing the number of maintenance and operation points as well as higher safety through the provision of single disconnection and isolation points. In addition to improving the lighting system control, ACC has purchased LED fixtures for newly implemented projects as a replacement for fluorescent and sodium fixtures.

Optimization of Cement Mills Operation Parameters

As cement mills represent the highest Electrical consumption account for 37% from overall Electrical Energy Load profile, ACC developed a tracking operation parameters tool that track all cement mills operation parameters and help to achieve new targets through agreed set of actions.

It is worth mentioning that most of Electrical Energy saving were gained from the optimization of cement mills operation parameters.

Hot Disk Installation

The Hotdisc's use of clinker cooler tertiary air and preheated raw meal, along with alternative fuel, ensures the maximum levels of energy efficiency. This results in maximum production capacity and minimum fuel and power consumption from the pyro system.

Barriers

The implementation of an EnMS at ACC faced very few barriers and challenges. This was due to the strong management commitment to energy performance improvement that was demonstrated through the provision of all the companies' resources to achieve its objectives. In addition, the in-depth implementation of other existing management systems has highly eased the adoption of a new one. However, some external factors such as the instability in energy supply, which has disrupted production, as well as other internal factors such as the change of energy team members have resulted in an extended duration of implementation of the EnMS. In addition, another challenge was the sector's nature of having subcontractors handling operation and maintenance, which was overcome through carrying out awareness sessions and meetings.

Lessons Learned

The implementation of the EnMS at ACC has proven to be both easy and cost effective giving a strong management commitment and the availability of adequate technical resources. It has also shown that, wherein the organization has an in-depth implementation of other management systems, the adoption of an EnMS requires significantly less effort from the organization's top management as the building blocks for the system are already in place.



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