UNITED NATIONS
INDUSTRIAL DEVELOPMENT ORGANIZATION

Industrial Energy Efficiency Project

In order to introduce a structured approach to energy management in operation, El-Nahda Cement Company 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 El-Nahda Cement Company to implement Energy Management System in alignment with ISO 50001 for an overall improvement in energy efficiency and improve environmental impact.

EGYPT

A Case Study of El-Nahda Cement Company

El-Nahda Cement Company Snapshot

Industry: Cement industries

Location: Qena Governorate, Egypt

Product: Cement

Implementation cost: ~0.19 MEGP

EnMS Scope: Electric & thermal energy

Annual Energy savings: ~5.885 GWh

Financial savings: ~4.01 MEGP

GHG reduction: ~ 1,101 tons CO_2eq

Overall payback: ~4 years

Objectives period: 4 years

Project Status: end of planning with some activities in implementation

Time to implement EnMS: 1.5 years

El-Nahda Cement Company has started production in 2012 and currently produces 2 million ton per year out of one dry process production line. The company receives electrical energy from the national grid at 66 kV. Thermal energy used to be heavy fuel oil until the end of 2016, when it was replaced by coal. The RDF will be introduced by the end of 2017, with a target to reach 20% of the thermal energy by the end of 2019.

The company serves domestic market and exports to Arab, Africa and European markets as well.

Implementing EnMS in El-Nahda is the way out

As intensive as the energy uses in cement industry is, every small saving becomes significant with the masses produced daily. Furthermore, cement sector, in domestic and worldwide markets, suffers a severe slump in demand and the problem is aggravated more by the jumps in energy prices and the lifting of the government subsidy. Additionally, El-Nahda Cement Company, similar to all Egyptian cement producers, had to inject new investment to switch the thermal energy source used in the pyro-process from HFO to coal and RDF.

The company management is meeting those challenges; to stay competitive and to pay back the new investments, by applying stringent measures in optimization of operation. The decision to implement EnMS with its systematic approach helps to manage and control energy consumption regardless the many changes taking place in energy uses.

El-Nahda EnMS objectives

The switching from HFO to coal and introduction of RDF, caused some delay in setting long-term objectives, as the baseline had to be repeated with new set of data with this significant change in thermal energy source; however, the energy team is closely monitoring the thermal energy consumption and is in the process of studying the identified energy conservation opportunities to establish action plan and consequently setting energy performance objectives.

UNIDO, a key player in El-Nahda success

With the training received from IEE-UNIDO and the support of the delegated consultants, the assigned energy team of El-Nahda Cement Company achieved the following:

- Management became committed to introduction of the EnMS system in the company and allocated resources to implement the system in terms of manpower, purchase of energy meters, training etc.
- Roles and responsibilities are identified to all staff members related to energy uses.
- Identification of energy saving opportunity lists.
- action plans drafting are in progress based on staff specific expertise.
- Awareness campaign for all plant staff.

Energy Saving Opportunities

Identified and Planned Opportunities						
S	**Identified and Planned Saving Opportunities**	**Elect Savings MWh**	**Ther. Saving MWh**	**Savings MEGP**	**Investment MEGP**	**Payback Year**
1	Reduce by-pass Percentage	-	5,571	3.84	-	-
2	Reduce equipment Running in NO load Check PLC program and modify to save	-	250	0.14	-	-
3	Automatic operating of compressors	63		0.05	0.2	4
Total		**63**	**5,821**	**4.01**	**0.2**	

Barriers

Barriers faced during the planning and implementation of EnMS were mainly related to:

- Frequent changes in the company top management. The EnMS and other activities were paused after each change, resulted in slow progress.
- The switch of thermal energy source from HFO to coal in the middle of planning phase.
- The long travelling distance to the company (air travel was needed) resulted in a reduction of meeting frequency.

These were overcome by:

- Conducting awareness sessions and introductory/ follow-up meetings with the top management in Cairo.
- Follow-up with the company team was made over emails and phone conference.

Lessons Learned

Cement companies by nature of industry are energy consumption sensitive and follow up of operation includes monitoring of energy consumption; yet EnMS added details that usually over looked:

- Establishing a baseline for consumption for a department and not only a main equipment
- Engaging maintenance staff in follow up of EnMS increased the awareness of their role in improving energy performance.
- Linking energy objectives and opportunities with continuous monitoring and verification
- Low cost or even zero cost could yield significant energy saving.

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