

# Industrial Energy Efficiency Project

In order to introduce a structured approach to energy management in operation, Royal Ceramica 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 Royal Ceramica 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 Royal Ceramica Company

#### Royal Ceramica EnMS Snapshot

**Industry:** Ceramic tiles industries

**Location:** industrial zone, Obour City, Cairo, Egypt

**Product:** Ceramic tiles

**Implementation cost:** ~ 0.25 MEGP

**EnMS Scope:** electricity, natural gas

**Annual Energy savings:** ~ 1,781GWh

**Financial savings:** ~ 1.435 MEGP

**GHG reduction:** ~ 1,318 CO<sub>2</sub>eq

**Overall payback:** ~ 1 year

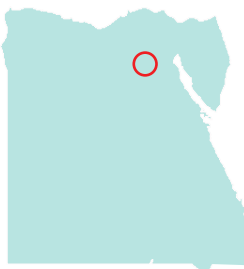
**Objectives period:** 2 years

**Project Status:** planning phase

**Time to implement EnMS:** 1 year

**Royal Ceramica** manufacturer of ceramic tiles, produces 18 million m<sup>2</sup> annually. The company employs is 1840 persons and operates an industrial facility in Obour city that includes 10 production lines and 8 gas fired kilns. The production is directed to the local market with about 30% to export to the EU, Africa, the Middle East, and Asia.

Royal Ceramica is certified in ISO 9001, 14001 and 18001. The three systems are integrated in one Management system which is managed by the quality director.



#### Implementing EnMS in Royal Ceramica is the way out

Recently, ceramic industry faces significant challenges; mainly due to severe competition between too many producers, slowing demand and the successive jumps in electrical and natural gas prices. Survival shall greatly depend on efficient use of resources. The management of at Royal Ceramica Company, early adopters of innovation and systems, has decided to adopt and introduce the EnMS as it provides the required framework to control and manage the energy. In addition to improving energy performance, EnMS provides the framework to align operation and maintenance towards operation optimization leading to cost effective practices and better competitiveness in the marketplace.

#### Royal Ceramica ambitious EnMS objectives

Although the company has not yet finished the planning phase; yet, based on the identified opportunities and the rough calculation of saving, also guided with the industry norms, the top management is challenging the plant management with ambitious objectives:

- Reduce electricity consumption by 10% by 2017
- Reduce natural Gas consumption by 5% by 2017

#### UNIDO, a key player in the plant's success

The energy team led by the energy manager, who received UNIDO user and the expert training, with the support of IEE delegated consultants managed to achieve:

- definition of roles and responsibilities
- carry out an in-depth analysis of the manufacturing process with regards to energy consumption to find out location of inefficient use or needing optimization
- obtaining management approval to installing energy sub-meters; based on the weak

correlation between estimated consumption and production

- identification, studying and prioritizing of energy conservation opportunities
- conducting company-wide awareness plan on energy efficiency

## Energy Saving Opportunities

Implemented/ In-progress Saving Opportunities					
S	Implemented/ In-progress Energy Saving Opportunities	Elect Savings MWh	Savings MEGP	Investment MEGP	Payback Year
1	Separate compressed air network to two branches to decrease losses. Control the compressed air used for cleaning the tiles in production lines by using photocell and electro-valves.	670	0.54	0.07	0.15
<b>Total</b>		<b>670</b>	<b>0.54</b>	<b>0.07</b>	<b>0.15</b>
Identified and Planned Opportunities					
S	Identified and Planned Saving Opportunities	Elect Savings MWh	Savings MEGP	Investment MEGP	Payback Year
1	Continuous Mills: Reducing the openings size of the raw materials screen grid and modify the additives feeding system and train the operators.	380	0.306	0.180	0.5
2	Spray Dryer: Replace operating system of the main blower from star-delta starter to inverter (VSD).	255	0.206	0.300	1.33
3	Stop the main pump of the hydraulic presses in the waiting time.	240	0.193	-	-
4	Dust Filter: (1) Install automatic shutter on the main suction duct of each machine. (2) Replace operating system of the main blower of four filters from star-delta starter to inverter (VSD).	236	0.190	0.220	1.00
<b>Total</b>		<b>1,111</b>	<b>0.895</b>	<b>0.700</b>	

## Barriers

The main barrier was the collection of accurate data of energy performance to formulate the baselines. The significant energy users (SEUs) were not metered; therefore, the energy consumption was provided, at the beginning, as calculated with some assumptions. Regression analysis based on the calculated consumption versus production gave weak correlation between consumption and production for the most of SEUs. Thus the decision was taken to install electricity and natural gas meters for SEUs. Some technical problems with regards to meters' installation are still being faced.

## Lessons Learned

Implementation of EnMS at Royal Ceramica has yielded the following two important experiences or lessons:

- Without management will and commitment, EnMS implementation would be impossible. This commitment must manifest its self as follow up and allocation of resources.
- Although the equipment at Royal ceramic are supplied by the world leader of equipment manufacturer for ceramics industry, opportunities for energy saving could be still found and small modification of the external accessories of the equipment could lead to important energy saving.



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