

# Industrial Energy Efficiency Project

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

## EGYPT

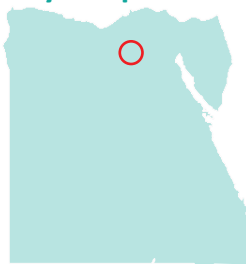
### A Case Study of Sphinx Glass Company

#### Sphinx Glass Company Snapshot

**Industry:** Glass industries

**Location:** Sadat City, Egypt

**Product:** float glass



**Implementation cost:** ~0.07 MEGP

**EnMS Scope:** electricity & thermal energy

**Annual Energy savings:** 4,397 MWh

**Financial savings:** ~2.418 MEGP

**GHG reduction:** ~ 3,254 ton CO<sub>2</sub>eq

**Overall payback:** ~ 2 years

**Objectives period:** 4 years

**Project Status:** Planning phase (2015)

**Time to implement EnMS:** one year

**Sphinx Glass:** with annual capacity of 200,000 tons of float glass, the company represents one of the largest float glass producers in Egypt that produces float glass of different colours, with or without coating. The company occupies an area of 220,000 m<sup>2</sup> in Sadat City and operates one production plant that engages 350 full time employees.

The domestic market consumes around 60 % of the total production; the rest is exported. The company has an ISO 9001 certified quality system.



#### Implementing EnMS in Sphinx Glass is the way out

Sphinx Glass Company is striving to keep its leading position as the largest float glass producer in Egypt and is looking for expansion of production and markets. To realize this management strategic directive, optimization of operation and cost reduction are the first effective measures that enable the company to maintain its competitiveness and spare resources for expansions.

As energy share represents almost 40% of the total production cost of glass, working on energy management is the obvious starting point. Sphinx glass joined IEE-UNIDO programme to implement EnMS according to the guidelines of ISO50001; i.e. adopting a systematic approach to record, control and improve energy consumption. EnMS also provides tools to monitor and sustain energy efficiency and performance improvement.

#### Sphinx Glass ambitious EnMS objectives

Sphinx Glass has set the long term energy objective: "Reduction of annual electrical consumption by 6 % till 2019". In addition, the company has also set the short term as follows:

- Reduce annual electrical consumption by 2.5 % in 2016
- Reduce annual electrical consumption by additional 3 % in 2017

## UNIDO, a key player in Sphinx Glass success

With support provided by IEE-UNIDO consultants, the energy team at the company has managed to finish the following steps of planning phase:

- establishing Energy Policy
- awareness campaign in Energy efficiency and EnMS
- energy review
- quantifying significant energy uses for electricity & NG
- identifying drivers and developing baseline
- identifying opportunities for energy saving
- developed an action plan
- setting objectives and targets

in addition to other benefits of EnMS, the following has significant value added to the organization:

- Using regression analysis to calculate coefficients of different drivers for each significant energy user helped the engineers to understand what drives energy consumption and to what extent each driver is critical.
- Identifying critical operating parameters has helped to document, monitor and control energy consumption; and it also helped to create more energy-sensitive parameters.
- Identifying maintenance parameters had a positive impact on the company. As some areas were not regularly maintained and the impact on energy consumptions was overlooked .

## Energy Saving Opportunities

Implemented/ In progress Energy Saving Opportunities						
S	Implemented/ In-progress Energy Saving Opportunities	Elect Savings MWh	Fuel Savings MWh	Savings MEGP	Investment MEGP	Payback Year
1	Compressed Air Optimization	750	-	0.413	-	-
2	Lehr Heating System Optimization	550	-	0.302	0.245	0.75
3	Cullet Belt 7 Optimization	125	-	0.068	-	-
4	Hot Well Pump Optimization	229	-	0.126	0.115	0.5
5	Man Cooling Fan Stoppage	238	-	0.131	0.014	-
6	LED Retrofitting	74	-	0.040	0.064	1.5
<b>Total</b>		<b>1,965</b>	<b>-</b>	<b>1.081</b>	<b>0.438</b>	

Planned Saving Opportunities						
S	Planned Energy Saving Opportunities	Elect Savings MWh	Fuel Savings MWh	Savings MEGP	Investment MEGP	Payback Year
1	Solar Coat Chimney	839	-	0.461	0.025	<0.08
2	Block Cooling Fan	1,593	-	0.876	0.950	2
<b>Total</b>		<b>2,432</b>	<b>-</b>	<b>1.337</b>	<b>0.975</b>	

## Barriers

- Management wanted to jump quickly to energy saving opportunities and to skip the process of identifying SEUs, drivers and EnPIs for each SEU.
- There is no historical data for most of the electrical equipment. This prevented identifying the energy consumption profiles for the some electrical SEUs.

These were overcome by:

- Meetings were held with management to explain the EnMS systematic approach that UNIDO follows.
- The consultants have advised the electrical department to install sub-meters for all SEUs.

## Lessons Learned

- Even for well managed and relatively new industrial facilities, such as in the case of Sphinx Glass Company, implementation of EnMS could have significant impacts on energy efficiency and operation; which results in important monetary saving.
- The concept of energy efficiency is relatively new to all technology suppliers; in particular to markets that used to enjoy favourable energy prices. EnMS provides an in-depth understanding of energy performance and the impacts of different parameters at different processes on consumption and efficiency; consequently, it equips trained staff with the technical knowledge to ask suppliers for better energy efficiency of the technology and process in concern.



## For more information:

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