

# Industrial Energy Efficiency Project

In order to introduce a structured approach to energy management in their operations, Egyptian Linear Alkyl Benzene Co. (ELAB) 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 ELAB 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 ELAB

### ELAB Snapshot

**Industry:**

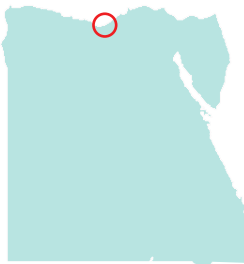
Petrochemicals

**Location:**

Alexandria, Egypt

**Product:** Linear

Alkyl Benzene



**Implementation cost:** ~100,000 EGP

**EnMS scope:** Electricity and Natural Gas

**Annual energy savings:** ~40.5 GWh

**Financial savings:** 5.2M EGP

**GHG reduction:** ~11.4 kCO<sub>2</sub>eq / 10 yrs

**Overall payback:** immediate

**Objectives period:** 3 years

**Time to implement EnMS:** 12 months

**ELAB** produce Linear Alkyl Benzene licensed for a capacity of 100 kton per year, It is one of the most important raw materials used in laundry detergents, light duty dishwashing liquids, and industrial cleaners.



### Implementing EnMS in Egypt is the way out

ELAB have turned its focus to reducing their energy consumption due to the energy supply shortages faced in 2013 that were followed by a 5-years plan to phase out energy subsidies. It was clear to ELAB's top management that the most economical way to fulfill their objectives would be through improving their energy efficiency. Hence, when they were introduced to the concept of energy management, it was a clear decision that it was the way forward. Throughout the process ELAB, top management and staff have shown a strong commitment to improving their energy performance, which was the key-success factor for the company in reaching compliance with ISO 50001.

### ELAB ambitious EnMS objectives

ELAB assigned its EnMS objectives with an approach of applying energy efficiency measures in order to improve facility-wide energy performance. ELAB objective is to reduce 3% of their electrical and 10% of their thermal energy baseline (EnB) by EOY 2018. The EnB was developed based on calculating statistical correlations between historical energy consumption and production.

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

ELAB has implemented an Energy Management System (EnMS) after receiving training and technical assistance from Sidi Kerir Petrochemicals Company (Sidpec) under the activities of the Petrochemicals Sector EnMS Peer-to-Peer (P2P) network. With support from UNIDO, the P2P under the patronage of the Egyptian Petrochemicals Holding Company EChem with the aim of qualifying all companies that fall under its umbrella in the implementation of an EnMS that is compliant with ISO 50001.



## Saving opportunities achieved

Measure	Savings MWh	Saving MMBtu	Savings EGP
<b>Implemented Energy Saving Opportunities</b>			
Optimization of hot oil Heater outlet temperature.		135,000	4,800,000
Updating the maintenance plan for the compressed air system	129		51,200
Switching off of HVAC units in admin building during non-working hours and on weekends	700		277,600
Replacing the electrical firewater pump used in daily fire drills by a diesel pump.	130		51,600
<b>Totals</b>	<b>4,840</b>	<b>135,000</b>	<b>5,180,400</b>
<b>Sample of Other Identified Energy Saving Opportunities*</b>			
Modification the refrigerators from one stage compressor to two stage compressor		12,600	Under Study
Replace the existing cooling water lines to polyethylene lines	900		44,700
<i>* To be implemented through the three years objective period</i>			

### Optimization of Hot Oil Heater Outlet Temperature

In the hot oil unit, oil is heated to 333°C through natural gas consumption. ELAB team has studied the possibility of decreasing the outlet temperature of the unit without negatively affecting the production process. Through experimentation of applying incremental decreases and quality verification methods, ELAB team proved that it is possible to decrease the outlet temperature to 320°C. The energy savings achieved were calculated to be equivalent to 450Nm<sup>3</sup>/hr. of Natural gas and were verified through comparison with historical consumption data.

### Updating the Maintenance Plan for the Compressed Air System

During the energy review phase, ELAB team has recorded a difference in energy performance of two identical air compression systems. Hence, a technical investigation was carried out and has identified the root-cause behind the varying performance is a difference in the maintenance carried out for each system. As a result, maintenance plan and standard procedures were updated. Through continuous monitoring, the team has proven that the energy performance of the compressed air system is now identical in both system and energy performance improvements were recorded compared to the baseline.

### Barriers

The implementation of an EnMS at ELAB 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. The main challenge ELAB faced was related to the nature of the petrochemicals where operational set points are very critical due to their high impact on the final product specification even with the slightest change. ELAB is dealing with this challenge by ensuring that all relevant action plan activities go through an in-depth technical assessment before implementation.

### Lessons Learned

The implementation of the EnMS at ELAB was carried out under the special conditions of the P2P network, which has proven to be a very successful framework for implementation. The technical and training support was provided by peers who "speak the same language". Furthermore, the collaboration between all the P2P members have enriched the process with fresh and innovative ideas to build a systematic approach in managing their energy consumptions.

### For more information:

UNIDO Project Management Unit  
in Egypt:

Email: [iee-egypt@unido.org](mailto:iee-egypt@unido.org)

Phone: +20 (2) 2380 0357

[ieeegypt.org](http://ieeegypt.org)

### UNIDO Headquarters:

Rana Ghoneim: [r.ghoneim@unido.org](mailto:r.ghoneim@unido.org)

Phone: +43 (1) 26026 4356

[unido.org](http://unido.org)