

Industrial Energy Efficiency Project

In order to introduce a structured approach to energy management in operation, Egyptian Petrochemicals Holding Co. "ECHEM" 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 ECHEM 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 Egyptian Petrochemicals Holding Co. "ECHEM"

ECHEM Snapshot

Industry: Petrochemicals Industries

Headquarter

Location:

5th settlement

New Cairo, Egypt

Plant Location

(50 plants):

Alexandria, Amreya, Damietta, Port Said, ...

Product: Petrochemicals, over 15 million tons of intermediates and final products per year

Implementation cost: ~0.250 MEGP

EnMS Scope: Electricity, Natural Gas and water

Energy savings: ~196 MWh/ year

Annual water saving: ~19,155 m³/year

Financial savings: ~0.257 MEGP/ year

GHG reduction: ~144 Metric Tons CO₂ eq

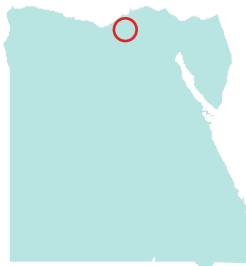
Project Status: Planning April 2016

Overall payback: ~2 years

Objectives period: 2 years

Time to implement EnMS: 12 month

The Egyptian Petrochemicals Holding Company (ECHEM) was established to manage the national petrochemicals Master Plan (2002-2022) that covers 14 complexes including 24 projects and 50 production units.



Implementing EnMS in ECHEM

Petrochemical production is considered the world largest and fastest growing industrial sector. It grows in terms of product varieties as well as the technology used in processing. As owner developer holding, ECHEM takes the responsibility providing guidance on new technology and methods that optimize exploitation of local natural resources and maximize the value added of crude oil. EnMS provided ECHEM with the systematic approach to optimize and improve the operation efficiency of projects and production units through improving energy efficiency and energy performance to contribute to the country-wide solutions of the energy shortage and to improve economics of operations.

ECHEM ambitious EnMS plan

To fulfill the role and responsibility of developing and improving the petrochemical industries; especially in adoption of EnMS, ECHEM, in cooperation with UNIDO, established "Peer to Peer Networking" between SEDPIC, one of the early adopters of EnMS in the sector, and the other affiliates. Additionally, to set the example, ECHEM decided to adopt EnMS in the headquarters building.

UNIDO, a key player in the success of ECHEM plan

With the training provided by UNIDO; ECHEM trained staff were engaged in a thorough process to review and analysis of the historic energy consumption and utilization.

Throughout the process, ECHEM has developed energy policy, defined the EnMS scope and boundaries and identified significant energy user (SEU), baselines, measurement plan, opportunity list for saving energy and also an action plan for each opportunity.

Energy Saving Opportunities

| Implemented Saving Opportunities | | | | | | |
|----------------------------------|---|-------------------|------------------------------------|--------------|-----------------|--------------|
| S | Implemented Energy Saving Opportunities | Elect Savings MWh | Water Savings m ³ /year | Savings MEGP | Investment MEGP | Payback Year |
| 1 | Reuse of blow down of Cooling tower for irrigation of gardens and using low flow areators | | 19,155 | 0.115 | 0.045 | 0.33 |
| 2 | Changing the external building lighting metal Halide to LED | 96.21 | | 0.083 | 0.200 | 2 |
| 3 | Installation of new solar cells in the main Building | 10.65 | | 0.009 | 0.180 | 10 |
| Total | | 106.86 | 19,155 | 0.207 | 0.425 | |

| Identified and Planned Saving Opportunities | | | | | | |
|---|---|-------------------|------------------|--------------|-----------------|--------------|
| S | Identified/Planned Energy Saving Opportunities | Elect Savings MWh | Fuel Savings MWh | Savings MEGP | Investment MEGP | Payback Year |
| 1 | Replace fluorescent by LED lightings | 43.00 | | 0.04 | 0.081 | 3.16 |
| 2 | Connect the 3 elevators in one control to avoid unnecessary elevator trips. | 3.65 | | 0.003 | 0.003 | 0.92 |
| 3 | Optimize chiller operation | - | 42 | 0.012 | - | |
| Total | | 46.65 | 42 | 0.055 | 0.084 | |

Barriers

At the beginning ECHEM faced some barriers to implement EnMS:

- Delay in approving the energy policy by top management
- Lack of communication between energy team and top management
- lack of sub-metering
- Lack of management commitment (sometimes)
- Maintenance programme includes only oil and filters replacement.
- Lack of finance for the implementation of energy saving projects.

With the increased awareness and more involvement of top management, ECHEM managed to remove all those barriers

Lessons Learned

Applying EnMS at the headquarters has set the example of possible saving even if consumption is relatively low with simple low cost or no cost measures. In addition, it has proven the importance of increasing awareness of all employees at all levels of worldwide energy efficiency and its environmental impact.

Furthermore, Peer to Peer networking between similar industrial activities proved to be very powerful tool in quick adoption of EnMS, as it provides the ready-made proven solution with successful evidence of EnMS application results.

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