UNITED NATIONS
INDUSTRIAL DEVELOPMENT ORGANIZATION

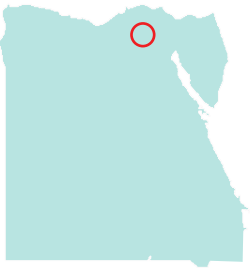
Industrial Energy Efficiency Project

Egyptian American Co. For Steel Rolling - Beshay Steel Group (EASROC) has joined hands with the GEF funded project, Industrial Eenergy 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 EASROC Company to implement an Energy Management System (EnMS) in alignment with ISO 50001 for an overall improvement in energy efficiency and improve environmental impact.

EGYPT

A Case Study of Egyptian American Steel Rolling Company (EASROC)

EASROC Snapshot



Industry: Iron and steel
Location: Menoufia, Egypt
Product: steel bars
Implementation cost: No cost
EnMS scope: Rolling Mills, Melt Shop Plants and Utilities
Annual energy savings: ~75 GWh
Financial savings: ~14.5 million EGP/year
GHG reduction: ~155 $ktCO_2eq$ / year
Overall payback: Immediate
Objectives period: 2015 - 2020
Time to implement EnMS: 16 months
EASROC employs 1,300 employees with total production of 1 million ton of billet and 1.2 million ton of reinforced bars and wire rod products.

Implementing EnMS in EASROC Company

The industrial sector in Egypt is moving towards Energy Efficiency (EE) due to the gradual phasing out of energy subsidies as well as challenges securing their energy demands. After attending two days User Training on EnMS, senior technical managers highlighted the potential gains from adopting an EnMS to the company's top management. Accordingly the company has made a decision of joining UNIDO expert training and work on the adoption of an EnMS in line with ISO 50001.

EASROC ambitious EnMS objectives

EASROC assigned its EnMS objectives by identifying and applying several EE measures in order to improve the facility-wide energy performance. EASROC assigned the following objectives to be achieved by 2020:

- Improve Electrical Consumption performance by 5%
- Improve Thermal Energy Consumption performance by 5%

The company has also identified an objective for the first year of implementation to improve their energy performance by 1-2%.

UNIDO, a key player in the plant's success

EASROC management and staff were engaged in a one year process by starting to implement EnMS compliant with ISO 50001 and ending with third party auditing and certification.

Saving opportunities achieved

No cost opportunities

Reduce ladle cover gap during preheating:
Ladle preheating is a continuous process where stand-by ladles are heated to liquid metal temperature at 1600°C using natural gas fueled burners. Reducing the gap between ladle cover and the ladle itself should eliminate temperature loss and shortens the time required to reach the required set point.

Using rice ash
Rice ash has a known effect of forming a heat isolation layer on the liquid metal surface thus reducing heat loss during ladle transfer from the electric arc furnace to the ladle furnace.

Increasing chemical energy
Liquid steel is formed inside EAF using a combination of electrical and chemical energy; chemical energy is much cheaper than electric energy; our aim is to change the energy balance inside EAF in favor of chemical energy thus reducing the share of electrical energy in the overall energy profile.

Reduce No. of water pumps
Water pumps are vital parts in the rolling process, providing just the adequate amount of water and eliminating all excess will considerably reduce energy usage in the whole of the rolling mill areas.

Stop the equipment during down time
Originally, running and stopping of rolling line equipment was solely decided by the mill pulpit operator. This was changed for better energy management. The mill line equipment now stop automatically after 1 minute if the mill stops. This has significantly reduced the baseload at the mill area. Operators were also instructed to manually stop all line equipment immediately if they foresee a long stoppage.

Investment opportunities

Billet hot charging: Originally, hot billets were cooled to ambient temperature then charged to the rolling mills reheating furnace. This process was altered for better use of furnace thermal energy. Billets are now transferred directly from the continuous casting mill cooling bed to the charging grid of the reheating furnace.

Insulation of reheating furnace: Reducing heat leakage from furnace roof using state of the art Insulation material provided by refractory suppliers.

Barriers

Although the implementation of EnMS at EASROC was smooth due to the strong management commitment, the energy team faced challenges and barriers along the way that were mainly related to:

- Data needed to establish the company's baseline and EnPIs were not readily available and lack of an adequate sub-metering system
- Frequent partial shut downs due to lack of energy availability
- Changes in input material for some processes

These were overcome through:

- Reliance on various data sources and calculation techniques to estimate as accurately as possible past trends in energy performance
- Recalibration of sub-meters
- Development of a preliminary baseline and modifying it at a later implementation stage of EnMS to reflect changes in input material

Lessons Learned

The implementation of the EnMS at EASROC has proven that even in cases where the company is experiencing lack of readily available data, changes in input material and other challenges, it is still possible to establish a well-defined systematic EnMS and achieve significant savings in the consumption of energy. In addition, no and low cost measure have demonstrated to have great potential savings even in complex industries such as iron and steel sector.

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