

Industrial Energy Efficiency Project

In order to introduce a structured approach to energy management in their operations, Al Ezz Flat Steel 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 Al Ezz Flat Steel Company to implement an Energy Management System in alignment with ISO 50001 for an overall improvement in energy efficiency and improve environmental impact.

EGYPT

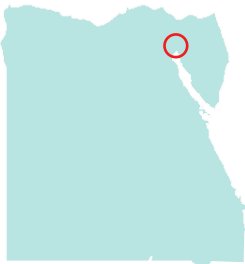
A Case Study of Al Ezz Flat Steel (EFS) Company

Al Ezz Flat Steel Company Snapshot

Industry: Iron and steel

Location: Suez, Egypt

Product: long steel and flat steel



Implementation cost: NA*

EnMS scope: Electricity and N. gas

Annual energy savings: ~100 GWh

Financial savings: ~30 million EGP /year

GHG reduction: ~1.02 mtCO₂eq (10 y)

Overall payback: NA*

Objectives period: 2015 - 2020

Time to implement EnMS: 16 months

Ezz Flat Steel produce 1.2 million ton of hot rolled coils. In addition to that EFS has a rolling facility of 1 million ton of long product.

* Implementation cost will vary based on the identified energy efficiency measures in the future. However, all the measures that have been identified so far are no/low cost



Implementing EnMS in Al Ezz Flat Steel Company

EFS has been facing challenges in securing their energy supply demands. In addition, Ezz group had made an expansion project for setting up a new DRI plant that would significantly increase the EFS energy demands. These two factors have strongly motivated EFS management to improve the plant overall energy performance through adopting EnMS (Energy Management System) with support from the IEE project.

Al Ezz Flat Steel ambitious EnMS objectives

EFS Company has set its EnMS objectives with an approach of ensuring full commitment of all staff from top management, supervisors and operators on all levels of the organization. EFS assigned the following objectives to be achieved by 2020:

- Reduce Electrical Consumption by 5 %
- Reduce Natural Gas Consumption by 10 %

UNIDO, a key player in the plant's success

The implementation of a structured EnMS at Al Ezz Flat Steel started by mid-2014 and by Q1 2015 the company has already fulfilled all the requirements of an EnMS inline with ISO 50001 requirements. The company has set September 2015 as target date to undergo the external audit and formal certification.





Saving opportunities achieved



No cost opportunities

Adoption of a protocol for unplanned shutdown procedures:

Reducing the amount of equipment working during the shutdown period is planned **reduce energy consumption** as follows:

- 2 cooling fan motors is operated during plant shutdown instead of 3 will save 3.8 MWh/day
- 1 filter pump motor operating for 1 hour daily during plant shutdown instead of continuous running will save 110 MWh/month

Optimization of Oxygen consumption levels:

Increasing specific oxygen consumption from 28 m³/ton to 32 m³/ton will **decrease electrical energy consumption** by 3KWh/Nm³ Oxygen

Minimization of tap-to-tap time:

Tap time (power Off) by 1 min. will **reduce energy consumption** by 0.8 KWh/t.

Increasing number of heats per sequence:

Increasing sequence length to 20 heats/seq. will **decrease electrical energy consumption** by 7KWh/t

Optimization of tapping time temperature control

0.22KWh/ton are lost to increase the temperature of 1 ton of molten steel by 1 °C above the proper tapping temperature. About 2.2 Kwh/t **can be saved** by optimizing the tapping temperature.



Investment opportunities

Billets hot charging:

The produced billets are received from Billet Continuous Casting machine at high temperature, more than 400 °C. The normal practice is to allow those billets to be cooled before charging to reheating furnace. The aim of the current project is to charge the hot billets directly. **Expected saving around 25%** of the energy required in the reheating furnace.

Barriers

Due to the strong commitment the top management has shown during the adoption of the EnMS, the company was able to overcome the following technical barriers:

- Extended period of time to establish accurate energy performance indicators due to the complexity of steel making process and number of drivers influencing energy performance
- Due to the organization size, the structure of the energy team has been revised several times which resulted in an extended implementation period.
- Due to the energy supply shortages, the plant has faced several unplanned shut downs which has made it difficult to test the accuracy of the baseline developed and the implementation of the action plan
- During the adoption of the EnMS, Ezz have made major modifications on the manufacturing process as well as the raw material used. As a result this has dictated the review of the company's baseline and EnPIs and thus delayed the certification process. This might also have an impact on the overall objectives and targets.

Lessons Learned

The implementation of the EnMS at Ezz Flat Steel has proven that even in the case of heavy complex industries such as steel manufacturing, there is a real opportunity to achieve significant energy savings without the need for big investments by adopting a systematic approach for monitoring energy performance. It has also shown that a strong management commitment is the key success factor to ensure the sustainability of the system.

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