

10% reduction in energy bill of a foundry MSME unit through Energy Efficiency Measures

Background

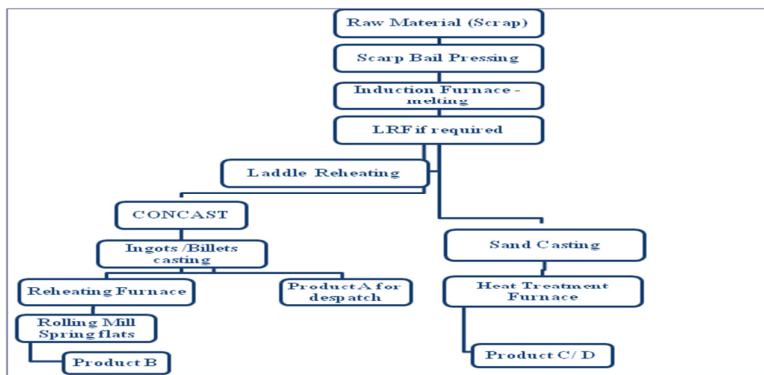
Faridabad is a mixed cluster in Haryana having over 12000 MSMEs majorily manufacturing various kinds of automobile parts, sheet metal components and fabrics. There are majorly 15 industrial segments in the cluster with a high range of products from soaps to tractors.

Unit Profile

M/s ABC is an MSME unit engaged in manufacturing of carbon steel and hot rolled steel products producing about 19675 tpa. Total Energy bill of the unit was Rs.1260 lakh per annum which was around 16% of total turnover. About 64% of the unit's energy bill was on account of Grid electricity, 27% accounted for PNG, 5% accounted for DG-Diesel, 4% accounted for Furnace oil and remaining 1% accounted for LPG.

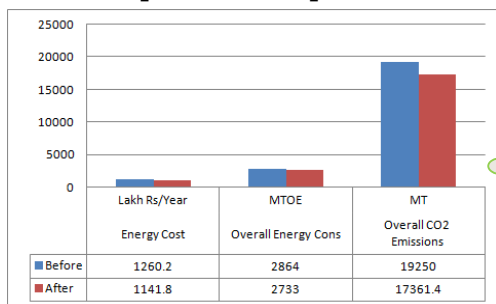
Process description

The manufacturing process involves the separation of turing wastes and sheet metal cuttings from the scrap before its loading into induction furnace. Melting of the metal is done in the furnace till the molten metal is heated to desired temperature of around 1600°C. Charging is done as per requirement till the desired level of molten metal is reached followed by the removal from the furnace to continuous casting machine by electric hoist for casting billets of required sizes. Moving further, billets are passed through a reheating furnace followed by the rolling process. These flats are removed from rolling stands using mechanized conveyers and cut to the desired size for final inspection and further processing / finishing before dispatch.



Piped natural Gas and Grid Electricity were used to operate major energy consuming equipments in the unit i.e. induction furnace, rolling motor, cooling tower and other utilities i.e. pumps, motors associated with equipments, and lighting.

Overall Impact - Post implementation



Overall Impact
10% reduction in Total Energy bill (i.e. savings of INR 118 lakh p.a.) Simple payback of 16 months

This case study has been prepared under WB GEF Project titled "Financing Energy Efficiency at MSMEs in India". The project aims to identify, design & implement Energy Efficiency (EE) solutions in 500 MSMEs in 5 clusters with potential of EE investment of more than Rs. 100 crore and reduction in GHG emissions equivalent to 1.2 million tonne CO₂. This project is being co-implemented by Small Industries Development Bank of India (SIDBI) and Bureau of Energy Efficiency (BEE).

INTERVENTIONS

Replacement of the Refractory Material of Preheating Furnace in Rolling Mill

Baseline Scenario

The average skin temperature on the side walls and top of the furnace was in the range from 70 to 160°C which is very high. Skin losses from the preheating furnace is around 215026 kcal/hr. Inadequate insulation-leading to high heat loss from surface resulting in poor combustion efficiency.

Recommendation

The unit was advised to improve the furnace refractory to reduce skin losses from 9.5% to 5.3%

Implemented Scenario

Based on the project's recommendation, the unit improved furnace refractory.

Newly replaced refractory material saves 38198 SCM of fuel per annum.



The investment of Rs.11 lakh made by the unit has resulted in monetary savings in energy cost of Rs.14 lakh per year with simple payback period of nine months.

Fuel Switching Over to PNG for Heat Treatment Furnace Application

The performance study was taken during the operational condition of the furnace. As suggested, the unit has switched furnace oil with PNG considering the cost difference. This has helped the unit to reduce overall fuel cost by Rs. 4 lakh per annum.

Installation of Oxygen Sensor in Heat Treatment Furnace

The excess air amount in flue gas was very high.. With the suggested recommendation, the unit has installed an oxygen sensor with close loop control. This has resulted in an annual fuel saving of 16490 liters/year, equivalent to about Rs. 8 lakh per year with simple payback period of nine months.

Support provided under the Project

- Walk Through & Detailed Energy Audit
- Identification of Energy Efficiency Interventions in the unit
- Finalization of the specifications for the Energy Efficiency Interventions
- Identification of technology providers/vendors
- Facilitation for an interactions between the unit and technology providers;
- Technical support during commissioning
- Monitoring & Verification

Disclaimer: This case study has been compiled by DESL on behalf of SIDBI under WB GEF Project. While every effort has been made to avoid any mistakes or omissions, any agency would not be in any way liable to any person by reason of any mistake/ omission in the publication.

For Further Information please contact at

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