

## 24% reduction in fuel bill of a casting MSME unit through Energy Efficiency Measures

### Background

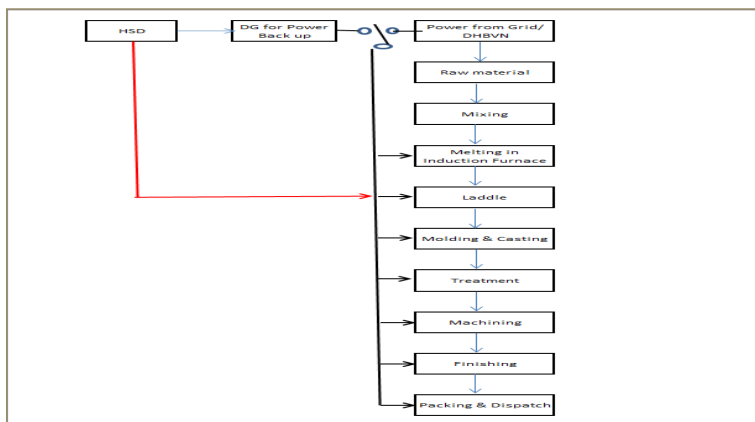
Faridabad is a mixed cluster in Haryana having over 12000 MSMEs majorly manufacturing various kinds of automobile parts, sheet metal components and fabrics. There are majorly 15 industrial segments in the cluster with a high range of products from soaps to tractors.

### Unit Profile

M/s ABC is a MSME unit engaged in manufacturing of nickel hard casting, grey iron, ductile iron casting, forged products & equipments. Total Energy bill of the unit was Rs.35.0 lakh per annum which was around 4% of total turnover. About 79% of the unit's energy bill was on account of Grid Electricity, 10% accounted for Diesel-DG and remaining 120% accounted for Diesel-Process.

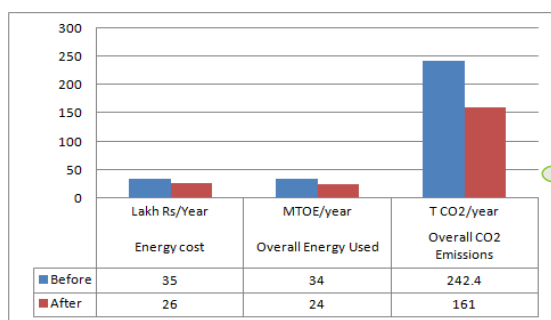
### Process description

The manufacturing process involves the making of core while mixing cast. Then it is mixed with Yamuna sand and this Core is further moulded in induction furnace at a temperature of 1460oC. Finishing of the products is done which includes turning, milling, drilling and tapping. After final inspection, the finished goods which are dispatched to Escorts and ABB.



Diesel and Grid Electricity were used to operate major energy consuming equipments in the unit i.e. induction furnace, compressors and other utilities i.e. pumps, motors associated with equipments, and lighting.

### Overall Impact - Post implementation



**Overall Impact**  
 24% reduction in Total Energy bill (i.e. savings of INR 9 lakh p.a.) Simple payback of 55 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 CO<sub>2</sub>. This project is being co-implemented by Small Industries Development Bank of India (SIDBI) and Bureau of Energy Efficiency (BEE).*

Optimization of Ladle Heating System

Baseline Scenario

Ladle of different capacities were preheated and was being used for pouring the molten metal from furnace to the mould. The ladle was kept idle leading to skin losses. The burner used for preheating the ladle was oversized and during the process of preheating flame was touching the surface. The heat loss from the ladle surface was 46723 kcal. The percentage fuel loss per kcal of heat loss was around 4%. Fuel system was also encountered with leakages.

**Recommendation**

The unit was advised to optimize the ladle heating system by optimizing the burner and reducing the skin temperature using insulation.

Implemented Scenario

Based on the project's recommendation, the unit optimized the ladle heating system.

Newly optimized system loses 493 liters of fuel per annum.

The Investment of Rs.40,000 made by the unit has resulted in monetary savings in energy cost of Rs.66,000 per year with simple payback period of seven months.

**Replacement of Induction Furnace**

The specific energy consumption of the furnace was 963kWh/Ton. As suggested, the unit has installed a compactor in the furnace to reduce SEC. This has helped the unit to increase the productivity and reduce the overall energy consumption.

**Reduction of cut-off pressure in compressor**

The cut-off pressure of the compressor was high (11 kg/cm<sup>2</sup>). With the suggested recommendation, the unit has reduced the cut-off pressure from 11 kg/cm<sup>2</sup> to 6.5 kg/cm<sup>2</sup>. This has resulted in an annual energy saving of 6329 kWh of electricity, equivalent to about Rs. 51,000 per year with simple payback period of 15 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 TERI 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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