

## 8% reduction in energy bill of a forging MSME unit through Energy Efficiency Measures

### Background

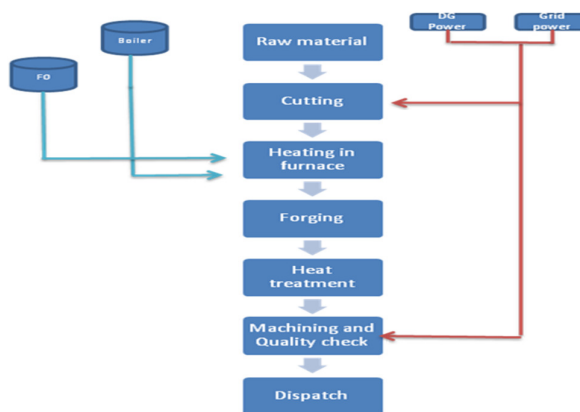
Faridabad is a mixed cluster in Haryana having over 12000 MSMEs majorly manufacturing various kinds of automobile parts, sheet metal components and fabrics. There are majorly 15 industrial segments in the cluster with a high range of products from soaps to tractors.

### Unit Profile

M/s ABC is an MSME unit engaged in manufacturing of heavy machinery parts producing about 1834 tpa. Total Energy bill of the unit was Rs.144 lakh per annum which was around 14% of total turnover. About 53% of the unit's energy bill was on account of Furnace oil, 35% accounted for Coal, 8% accounted for Grid electricity and remaining 4% accounted for Diesel.

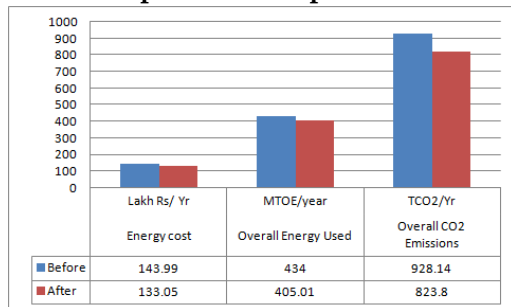
### Process description

The manufacturing process involves the procurement of raw material in the form of rods and billets followed by cutting into required shapes. The cut stock is then heated in the FO fired forging furnace to raise its temperature from ambient temperature to forging temperature 1,100 Deg C. The heated pieces are then forged with the help of multiple steam hammers to shape the components as per the requirement and excess flash metal is trimmed in a shearing machine. Heat treatment is outsourced. Finally it is being grinded as per the customer's requirement and dispatched after inspection.



Furnace oil, Coal, Diesel and Grid Electricity were used to operate major energy consuming equipments in the unit i.e. lathe machines, furnace and other utilities i.e. pumps, motors associated with equipments like band saw, drilling machines, and lighting.

### Overall Impact - Post implementation



**Overall Impact**  
8% reduction in Total Energy bill (i.e. savings of INR 11 lakh p.a.) Simple payback of 9 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).*

## INTERVENTIONS

### Application of Insulation on Furnace Ceiling and Walls

#### Baseline Scenario

The measurement plan was made to carry out the flue gas analysis of furnace and also the thermal profiling. Thermal profiling included the temperature measurement on the surface of the furnace. It is found that the skin losses in the furnace is about 6.4% and the temperature on the ceiling and outer walls is 148°C and 63°C. From the total area of around 38 m<sup>2</sup>, the total heat loss was around 94779 kcal/hr equivalent to fuel consumption of 9.4 kg/hr leading to high energy cost and poor performance of the furnace.

#### Recommendation

The unit was advised to apply insulation on the furnace to reduce skin loss.

#### Implemented Scenario

Based on the project's recommendation, the unit applied insulation on the furnace walls and ceiling.

Newly installed insulation allows 30898 kcal of heat to lose per hour.



The Investment of Rs.2 lakh made by the unit has resulted in monetary savings in energy cost of Rs.6 lakh per year with simple payback period of four months.

#### Arresting of Fuel leakage in the furnace

The average fuel leakage of around 0.32 liters was found near the burner. As suggested, the unit has reused the leaked fuel. This has helped the unit to reduce the overall fuel consumption and the energy cost of the unit leading to improved performance.

#### Replacement of T-12 fixtures with T-5 fixtures

The unit was lighting the production area through T-12 38W lamps. With the suggested recommendation, the unit has replaced T-12 lamps by T-5 lamps. This has resulted in an annual energy saving of 2800 kWh of electricity, equivalent to about Rs. 30,000 per year with simple payback period of five 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

Energy Efficiency Centre, Small Industries Development Bank of India (SIDBI), Ground Floor, E-1, Videocon Tower, Jhandewalan Extension, Rani Jhansi Road, New Delhi-110055, India, Ph. 011 23682473-77, [www.sidbi.in](http://www.sidbi.in)

