

23% reduction in energy bill of a forging MSME unit through Energy Efficiency Measures

Background

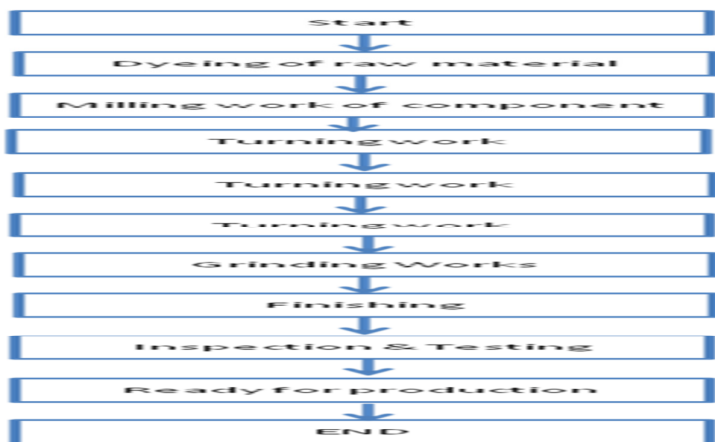
Faridabad is a mixed cluster in Haryana having over 12000 MSMEs majorly manufacturing various kinds of automobile parts, sheet metal components and fabrics. There are majorly 15 industrial segments in the cluster with a high range of products from soaps to tractors.

Unit Profile

M/s ABC is an MSME unit engaged in manufacturing of forging of auto parts. Total Energy bill of the unit was Rs.105.52 lakh per annum which was around 13% of total turnover. About 77% of the unit's energy bill was on account of furnace oil, 13% accounted for Grid electricity and remaining 10% accounted for Diesel-DG.

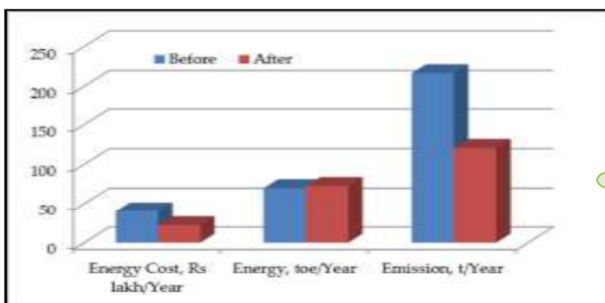
Process description

The manufacturing process involves the heating of raw material to the desired temperature followed by hammering with the help of mechanical hammers. The material is given desired shape as required followed by different machining operations like milling, drilling, turning, grinding etc. When machining is completed the product is inspected and sent for dispatch.



Furnace Oil, Grid Electricity and Diesel were used to operate major energy consuming equipments in the unit i.e. hammers, presses, EDM and other utilities i.e. pumps, motors associated with equipments like compressors and shearing machines, and lighting.

Overall Impact - Post implementation



Overall Impact
23% reduction in Total Energy bill (i.e. savings of INR 24 lakh p.a.) Simple payback of 24 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

Reduction of Heat loss due to Openings of Forging Furnace

Baseline Scenario

Size of the openings of the forging furnace was very large and the door remained open all the time during operation. With the 100% door opening time, the heat loss from opening was around 9900 kcal/hr. The percentage heat loss due to opening was around 10.5%. This resulted to an equivalent fuel loss of 3550 kg per annum.

Recommendation

The unit was advised to reduce the opening time to 60% to reduce the heat loss due to opening.

Implemented Scenario

Based on the project's recommendation, the unit reduced the opening time to 60%.

Reduced opening time saves 2130kg of fuel per annum. This results in the reduction of percentage heat loss due to opening from 10.5% to 4.2%.

The Investment of Rs.1.13 lakh made by the unit has resulted in monetary savings in energy cost of Rs.1.02 lakh per year with simple payback period of 13 months.

Replacement of Forging Furnace-2 by Electrical Furnace

The furnace was operating at 11% efficiency and the SEC was 1301kcal/kg which was quite high. As suggested, the unit has installed an electrical furnace in place of forging furnace-2. This has helped the unit to reduce an equivalent fuel consumption of 16000kg per annum.

Replacement of existing Lights by High Efficiency Lights

The unit was lighting the production area through 24 no. of T-12 lamps and 8 Street lamp fixtures with a total load of 4.5kW. With the suggested recommendation, the unit has replaced these fixtures by T5 tube lights. This has resulted in an annual energy saving of 2633 kVAh of electricity, equivalent to about Rs. 24,000 per year.

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.

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