

27% 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 a MSME unit engaged in manufacturing axles, gears, hubs, rings, spindles, steering, knuckle, sleeves etc producing about 3800 tpa. Total Energy bill of the unit was Rs.484.5 lakh per annum which was around 21% of total turnover. About 56% of the unit's energy bill was on account of Grid electricity, 39% accounted for PNG and remaining 5% accounted for Diesel.

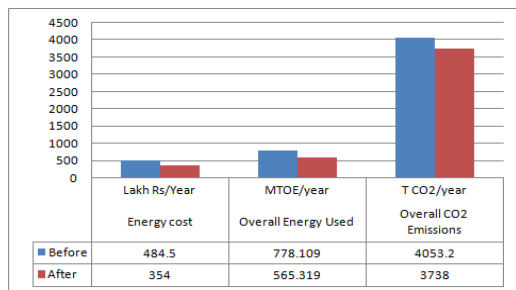
Process description

The manufacturing process involves the cutting of raw material into required shapes. It then goes through heating process in induction heater or PNG furnace. Post heating, the material goes through the process of Forging and Ring rolling in respective machines. After which trimming of the product takes place. The next step involves heat treatment of the product, such as hardening, normalizing and tempering. The heat treatment furnaces are PNG fired furnace. After heat treatment, testing of the product takes place. Post which shot blasting and other machining processes are carried out. Finally the product goes for painting and drying. After the quality check the product is packed and dispatched.



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

Overall Impact - Post implementation



Overall Impact
27% reduction in Total Energy bill (i.e. savings of INR 130 lakh p.a.) Simple payback of 12 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 existing Compressed air circuit with new circuit

Baseline Scenario

The detailed study of compressors was carried out during the field survey. It was observed that during DEA 7 major leakage points of 0.5 mm diameter and above were located in the compressed air circuit of Forge Shop and Forging press 1600 Ton. Screw compressors of 30 HP were in continuous operation, required to maintain production in the plant. This was equivalent to a loss of 50% of the compressed air whereas acceptable loss is approximately 5-10% of total CFM delivered.

Recommendation

The unit was advised to replace or retrofit the damaged section or accessories.

Implemented Scenario

Based on the project's recommendation, the unit replaced the existing compressed air circuit.

Newly installed circuit allows the leakage of 0.365 Nm³ of air per minute

The Investment of Rs.7 lakh made by the unit has resulted in monetary savings in energy cost of Rs.8 lakh per year with simple payback period of 12 months.

Voltage regulation of Feeders by installing Servo Stabilizer

The average voltage of the feeder was around 443 V. As suggested, the unit has installed servo stabilizer to reduce the voltage to 400 V. This has helped the unit to reduce the overall energy consumption and improved performance of equipments.

Replacement of T-12 Lamps with T-5 Lamps

The unit was lighting the production area through 79 no of T-12 lamps. With the suggested recommendation, the unit has replaced T-12 lamps with T-5 lamps of same quantity. This has resulted in an annual energy saving of 10428 kWh of electricity, equivalent to about Rs. 81,000 per year with simple payback period of ten 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.

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