

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

Background

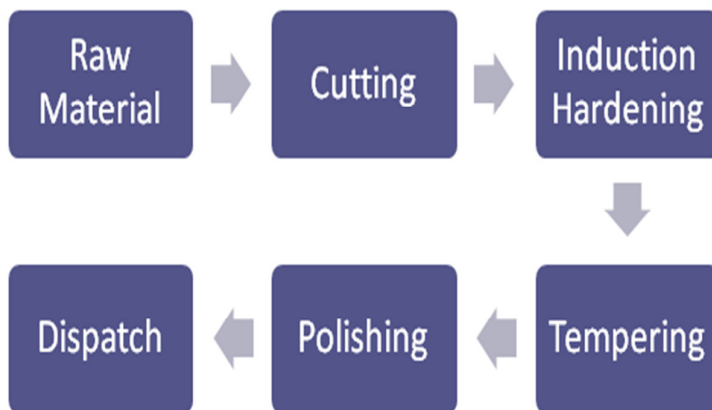
Faridabad is a mixed cluster in Haryana having over 12000 MSMEs majorly manufacturing various kinds of automobile parts, sheet metal components and fabrics. There are majorly 15 industrial segments in the cluster with a high range of products from soaps to tractors.

Unit Profile

M/s ABC is a MSME unit engaged in manufacturing of case hardening components. Total Energy bill of the unit was Rs.8.45 lakh per annum. All of the unit's energy bill was on account of Grid electricity and no other energy source was used.

Process description

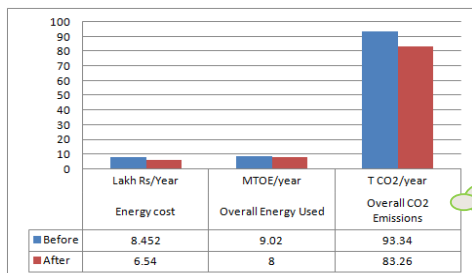
The manufacturing process involves the procurement of raw material followed by their cutting as per the required specifications. The material is then hardened. The unit has 2 induction hardening machines of 35 kW and 25 kW provided with servo stabilizers. High frequency current is passed through circular coils which creates a high magnetic field. The component is passed through the coil, where induced current starts



flowing around it. The current raises the temperature of the component surface to the desired level required for hardening. The component is provided with an instant quenching also. The temperature of the quenching raw water is maintained at not more than 40-41 degree Celsius. There is 1 no. electrical tempering oven of 9 kW in which a temperature of 150-200 degree Celsius is provided for stress relieving of the component surface. The material is fed into the oven in Steel trays. The component is inspected before dispatch to client.

Grid Electricity was used to operate major energy consuming equipments in the unit i.e. induction hardening machine and other utilities i.e. pumps, motors associated with equipments, and lighting.

Overall Impact - Post implementation



Overall Impact
 23% reduction in Total Energy bill (i.e. savings of INR 2.6 lakh p.a.) Simple payback of 26 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

Installation of Servo Stabilizer to Optimize the voltage of Plant

Baseline Scenario

The average line voltage of the plant was around 412 V and the maximum recorded voltage was coming out to be 417 V. The energy consumption of the plant was 96,964 kWh per annum. The average line voltage is very high and no voltage stabilizer was installed. High input voltage leading to inefficient operation and increased chances of overvoltage faults in the machines .

Recommendation

The unit was advised to install a servo stabilizer to regulate the voltage of the entire unit.

Implemented Scenario

Based on the project's recommendation, the unit installed a servo stabilizer.

Newly installed system saves 5266 kWh of energy per annum.



The Investment of Rs.3 lakh made by the unit has resulted in monetary savings in energy cost of Rs.1.5 lakh per year with simple payback period of 26months.

Installation of Energy Monitoring System

The unit had no energy monitoring system at machine level. As suggested, the unit has installed an individual energy monitoring system for major equipment. This has helped the unit to improve the operational efficiency of the equipments.

Replacement of T-12 lamps by T-5 lamps

The unit was lighting the production area through T-12 lamps. With the suggested recommendation, the unit has replaced T-12 lamps with T-5 lamps. This has resulted in an annual energy saving of 475 kVAh of electricity, equivalent to about Rs. 4000 per year with simple payback period of 45 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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