9.1% reduction in Energy bill of a Heat Treatment MSME unit through Energy Efficiency Measures

Background

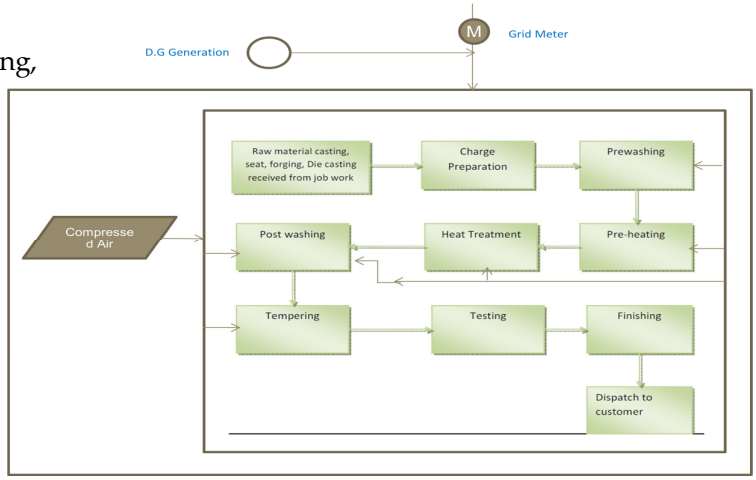
Faridabad is a mixed cluster in Haryana having over 12000 MSMEs majorly manufacturing various kinds of automobile parts, sheet metal components and fabrics. There are majorly 15 industrial segments in the cluster with a high range of products from soaps to tractors.

Unit Profile

M/s ABC is a MSME unit engaged in heat treatment processes. Total Energy bill of the unit was Rs.231 lakh per annum which was around 14% of total turnover. About 89% of the unit's energy bill was on account of Grid Electricity and remaining 11% accounted for Diesel-DG.

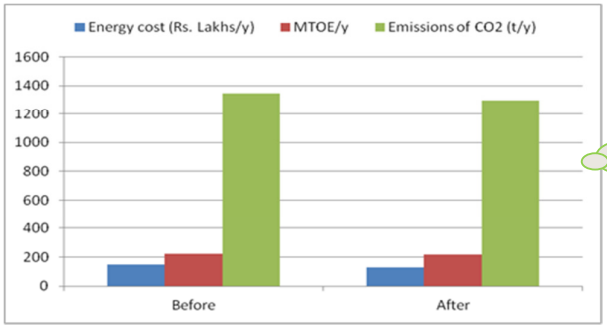
Process description

The manufacturing process involves casting, forging, washing and preheating of the material followed by the heat treatment process. The heat treatment service provided by the unit includes surface treatment; vacuum heat treatment and atmospheric heat treatment. The surface heat treatment process is different for different jobs, which may include: Ammonia Nitriding, Nitro Carburizing, Ni temper, Ferrite Nitro carburizing. The atmospheric heat treatment services offered by the unit include gas carburizing, carbonitriding, stress relieving and tempering. Vacuum heat treatment services include vacuum hardening with isothermal quenching, vacuum tempering, stress relieving, bright annealing, vacuum carburizing, vacuum carbonitriding, vacuum brazing and precipitation hardening. After heat treatment, material is once again washed before tempering.



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

Overall Impact - Post implementation



Overall Impact

9.1% reduction in Total Energy bill (i.e. savings of INR 20.9 lakh p.a.) Simple payback of 13 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_2. This project is being co-implemented by Small Industries Development Bank of India (SIDBI) and Bureau of Energy Efficiency (BEE).

INTERVENTIONS

Replacement of cooling tower pumps with adequate capacity pumps for VHT pumping system

Baseline Scenario

The cooling tower pump with a capacity of 93.6 cubic meter/hour was consuming around 79200 kWh/Year of energy. The actual flow requirement is 18.6 cubic meter/ hour. It seems that existing pumps are very high capacity pumps which consume huge power when in operation..

Recommendation

The unit was advised to install the new smaller pumps having adequate capacity with variable frequency drive which shall reduce the power consumption substantially

Implemented Scenario

Based on the project's recommendation, the unit replaced the existing cooling tower pumps with adequate capacity pumps.

Newly installed pump saves 57785 kWh of electricity per annum.

The Investment of Rs.1.43 lakh made by the unit has resulted in monetary savings in energy cost of Rs.4.27 lakh per year with simple payback period of four months.

Energy Management System

The metering system was only at input level; i.e. metering at the grid and the information on which machine consumes lesser energy was not being monitored. As suggested, the unit has installed a metering and monitoring system for all air compressors and DG panels. This has helped the unit to improve the operational efficiency of the equipments.

Replacement of Compressors

The unit has two screw compressors which were tested for performance. One screw (IR) compressor had poor performance and was consuming high power during unload. As suggested, the unit has installed a new screw compressor. This has helped the unit to improve energy efficiency and to reduce unload power consumption.

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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