

54% reduction in Energy bill of a Plastic MSME unit through Energy Efficiency Measures

Background

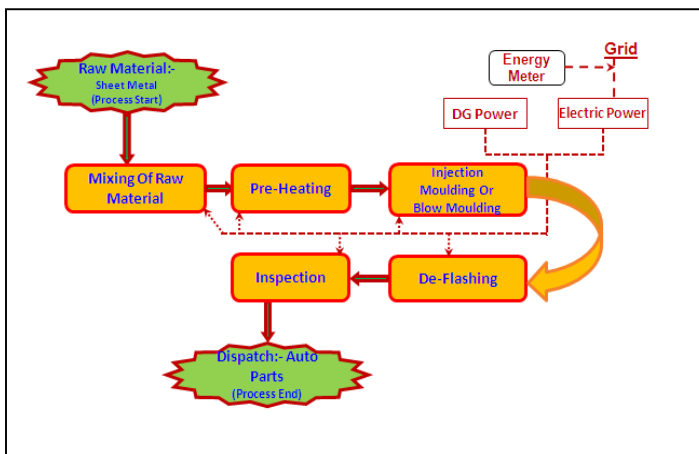
Faridabad is a mixed cluster in Haryana having over 12,000 MSMEs majorly manufacturing various kinds of automobile parts, sheet metal components and fabrics. There are majorly 15 industrial segments in the cluster with a high range of products from soaps to tractors.

Unit Profile

M/s ABC is an MSME unit engaged in manufacturing of plastic components and articles for auto industries producing about 400TPA. Total Energy bill of the unit was Rs. 41.5 lakh per annum which was around 3.5% of total turnover. About 80% of the unit's energy bill was on account of Grid electricity and remaining 20% accounted for Diesel in Diesel Generator set.

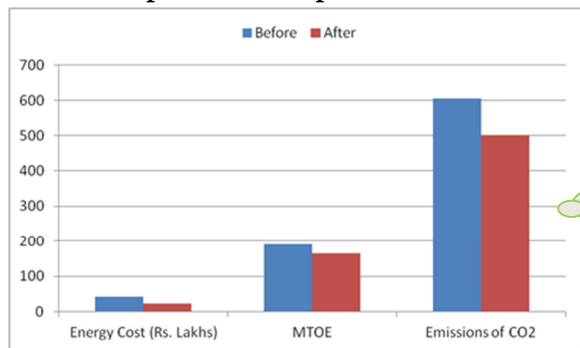
Process description

The manufacturing process involves procurement of raw material from market followed by quality and quantity testing. Raw material after mixing and preheating is fed into IMM which feeds it into a heating chamber. A plunger pushes the plastic through the heating chamber where the material is softened into a fluid state. At the end of this chamber, the resin is forced into a closed mould. Once the plastic cools to a solid state, the mould opens and the finished product is ejected. The product coming out of IMM is sent for dispatch after quality testing.



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

Overall Impact - Post implementation



Overall Impact
54% reduction in Total Energy bill (i.e. savings of Rs. 22 lakh per annum). Simple payback of 10 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

Modification of the Mould design for productivity improvement

Baseline Scenario

Conventional mould designs were large and heavy. Conventional moulds were designed for a limited productivity. The pressure required for the operation was high resulting in high power requirement. The power consumption for these kind of moulds was 692,358 kWh/year which was relatively high. Inadequate mould design-leading to high pressure requirement and thus high energy consumption.

Recommendation

The unit was advised to improve the design of moulds and to optimize the hydraulic pressure requirement to improve productivity.

Implemented Scenario

Based on the project's recommendation, the unit modified the mould design. Energy consumption for modified moulds is 1,602 kWh/MT.



The Investment of Rs. 8.4 lakh made by the unit has resulted in monetary savings in energy cost of Rs. 4.5 lakh per year with simple payback period of 22 months.

Installation of VFD on Injection Moulding Machine

All the injection moulding machines were having heater load and motor load where peak power was not required for complete duration. As suggested, the unit has installed a VFD in two IMM's. This has helped the unit to reduce overall energy consumption. This has resulted in an annual saving in fixed charges of 0.98 lakh Rs with a simple payback period of 40 months.

Increase in Contract Demand of the Unit

The contact demand of the unit was 150 kVA. With the suggested recommendation, the unit has increased the contract demand to 200 kVA to avoid attraction of penalty charges. This has resulted in an annual saving in fixed charges of Rs. 8.5 lakh with a 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

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