

15% reduction in Energy bill of a Plastic MSME unit through Energy Efficiency Measures

Background

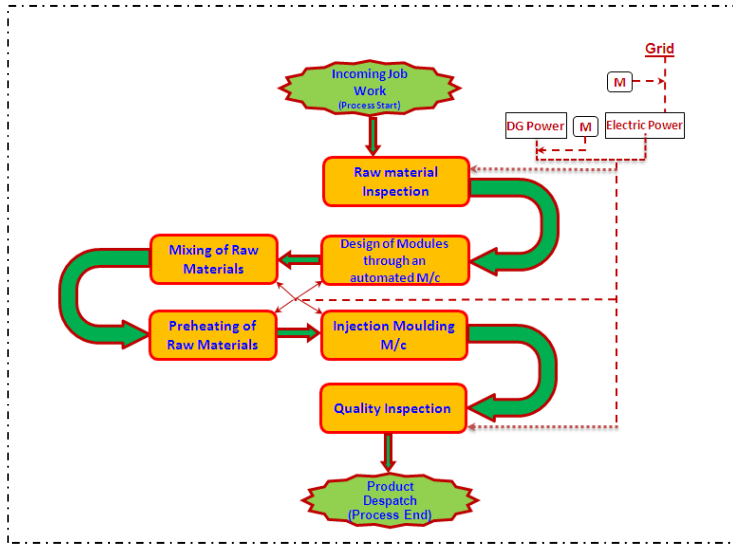
Faridabad is a mixed cluster in Haryana having over 12000 MSMEs majorly manufacturing various kinds of automobile parts, sheet metal components and fabrics. There are majorly 15 industrial segments in the cluster with a high range of products from soaps to tractors.

Unit Profile

M/s ABC a MSME unit engaged in manufacturing of plastic moulds and components for home appliances and electrical items. Total Energy bill of the unit was Rs. 66.6 lakh per annum which was around 8% of total turnover. About 63% of the unit’s energy bill was on account of Grid electricity and remaining 37% accounted for diesel in Diesel Generator set.

Process description

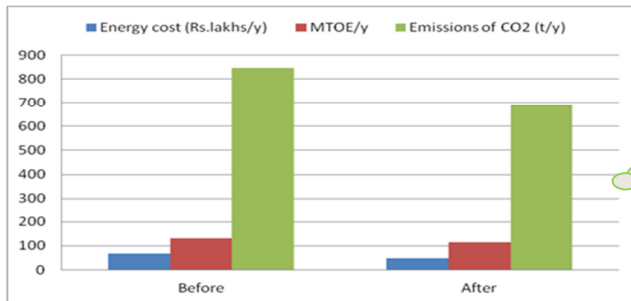
The manufacturing process involves the procurement of raw material from market followed by their testing for quality and quantity. Sample design of product received from clients and accordingly moulds are prepared in house. Mould prepared as per product fixed in the injection moulding machine. Raw material after mixing and pre heating is fed into a hopper, 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 injection moulding is sent for dispatch after quality testing.



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Overall Impact - Post implementation



Overall Impact
15% reduction in Total Energy bill (i.e. savings of Rs. 10 lakh per annum). Simple payback of 6 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

Insulation of Heaters for Injection Moulding machine

Baseline Scenario

The unit has 16 injection moulding machines of which study was carried out in 13 machines which were operational. Out of these, 4 machines had insulated barrels and the remaining were un-insulated. The average skin temperature of IM machines barrel area was found to be in the range of 115°C to 201°C and by insulating this heating area energy loss due to radiation can be avoided.

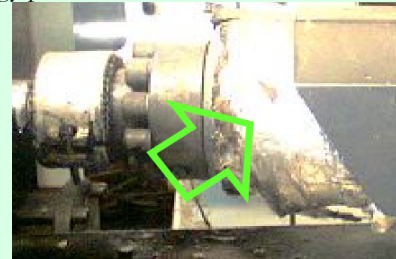
Recommendation

The unit was advised to use insulations for heaters in IM moulding machines.

Implemented Scenario

Based on the project's recommendation, the unit insulated all the heaters in IM moulding machines.

Newly installed insulation saves 39,607 kWh of energy per annum.



The Investment of Rs.1.3 lakh made by the unit has resulted in monetary savings in energy cost of Rs. 3.19 lakh per year with simple payback period of five months.

Optimization of Cooling Tower

The average power factor of the cooling tower auxiliaries was very low and the overall effectiveness of the system was around 54.8%. As suggested, the unit has installed a fixed capacitor bank on fan and pump to improve the power factor. This has helped the unit to reduce distribution losses and voltage fluctuation.

VFD in Injection Moulding Machine

The unit has machine which works in cyclic manner and peak power is not required for complete duration. As suggested, the unit has installed VFD in motor of one IMM. This has resulted in an annual energy saving of 8400 kWh of electricity, equivalent to about Rs. 68,000 per year with simple payback period of 23 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

Energy Efficiency Centre, Small Industries Development Bank of India (SIDBI), Ground Floor, E-1, Videocon Tower, Jhandewalan Extension, Rani Jhansi Road, New Delhi-110055, India, Ph. 011 23682473-77, www.sidbi.in

