

22% reduction in energy bill of a plastic MSME unit through Energy Efficiency Measures

Background

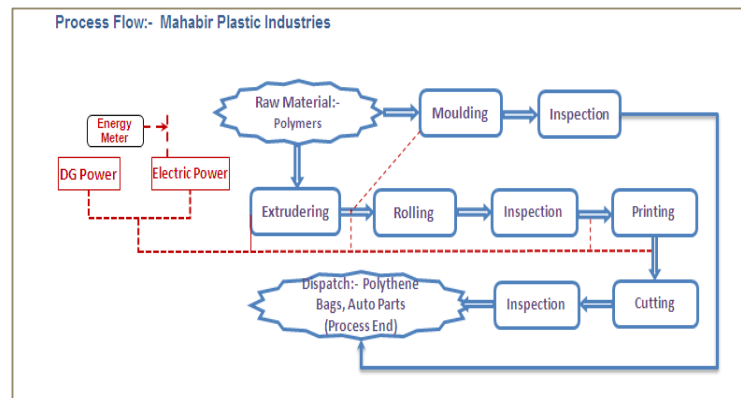
Faridabad is a mixed cluster in Haryana having over 12000 MSMEs majorly manufacturing various kinds of automobile parts, sheet metal components and fabrics. There are majorly 15 industrial segments in the cluster with a high range of products from soaps to tractors.

Unit Profile

M/s ABC is an MSME unit engaged in manufacturing of polythene bags and plastic components producing about 1100 tpa. Total Energy bill of the unit was Rs.39.88 lakh per annum which was around 4% of total turnover. About 68.7% of the unit's energy bill was on account of Grid electricity and remaining 31.3% accounted for Diesel-DG

Process description

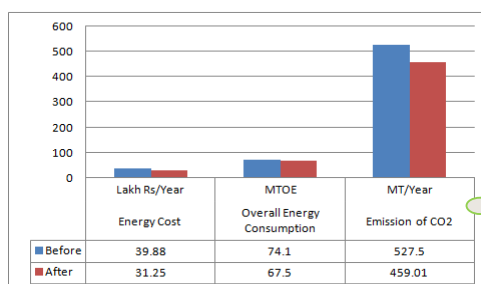
The manufacturing process involves the procurement of material from market followed by quality and quantity tests. Manufacturing of polythene bags undergo the process of extrusion. Product coming out of extruder machine gets rolled and printing process is completed after inspection. The products range are film and polythene bag. Other plastic components undergo the process



of injection moulding. Once the plastic cools to a solid state, the mold opens and the finished product is ejected. There after it is sent for cutting and final inspection. It is further moved for dispatch.

Diesel-DG and Grid Electricity were used to operate major energy consuming equipments in the unit i.e. plastic extruder & injection moulding and other utilities i.e. pumps, motors, compressor, HVAC associated with equipments, and lighting.

Overall Impact - Post implementation



Overall Impact

22% reduction in Total Energy bill (i.e. savings of INR 8.6 lakh p.a.) Simple payback of 7 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 of Plastic Extruder Machines

Baseline Scenario

Heating barrel of extruder machine had an average skin temperature in the range of 120-170°C which is very high.

The heat loss from the barrel body is around 8210 kcal/hr and a annual heat loss of 59M kcal. Inadequate insulation-leading to high heat loss from surface resulting in poor efficiency of the extruder machine.

Recommendation

The unit was advised to use insulation for heaters in extruder machines to reduce the heat loss from the barrel surface.

Implemented Scenario

Based on the project's recommendation, the unit insulated the heaters in extruder machines.

Newly insulated heaters have heat loss of 1.79M kcal per annum.



The Investment of Rs.4 lakh made by the unit has resulted in monetary savings in energy cost of Rs.5 lakh per year with simple payback period of ten months.

Installation of capacitor bank to improve power factor

The average power factor of the unit was low, at 0.890. As suggested, the unit has installed a fixed capacitor bank to improve the power factor to about 0.99. This has helped the unit to reduce distribution losses and voltage fluctuation besides avoiding penalty.

Replacement of Low Efficiency Fixtures by High Efficiency Fixtures

The unit was lighting the production area through 52W & 32W FTL lamps. With the suggested recommendation, the unit has replaced FTL lamps by 30W & 32W T5 lamps. This has resulted in an annual energy saving of 4618 kWh of electricity, equivalent to about Rs. 34000 per year with simple payback period of seven 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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