

5.4% reduction in Energy bill of a Textile MSME unit through Energy Efficiency Measures

Background

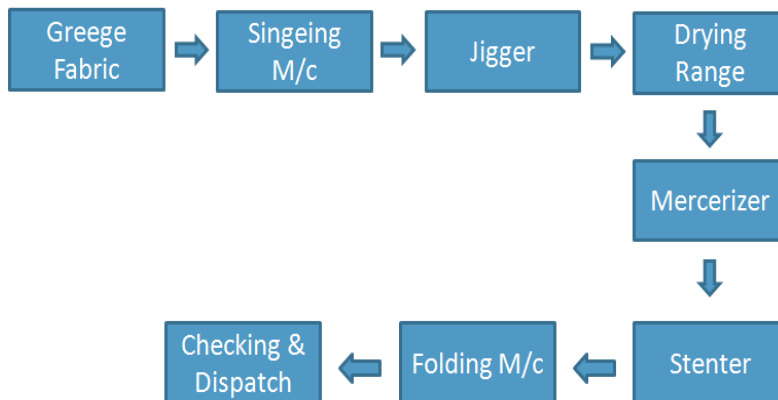
Faridabad is a mixed cluster in Haryana having over 12000 MSMEs majorly manufacturing various kinds of automobile parts, sheet metal components and fabrics. There are majorly 15 industrial segments in the cluster with a high range of products from soaps to tractors.

Unit Profile

M/s ABC is a MSME unit engaged in dyeing and processing of woven fabrics (Cotton, polyester, Viscose and Blends). Total Energy bill of the unit was Rs.431.0 lakh per annum which was around 17% of total turnover. About 34.7% of the unit's energy bill was on account of Grid electricity, 16.2 % accounted for Diesel-DG and remaining 49.1% accounted for Petcoke as thermal energy.

Process description

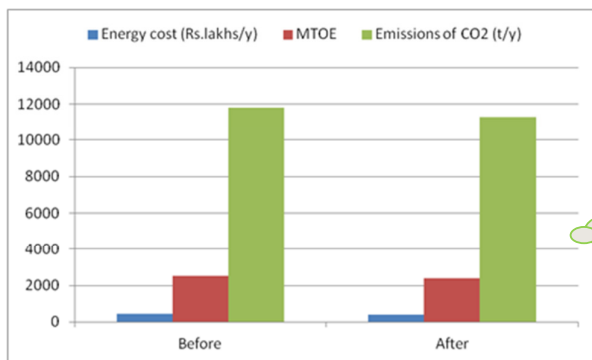
The manufacturing process involves Singeing in which the protruding fibers and loose threads on both faces of the fabric are removed. The fabric is given an enzyme treatment so that the impurities such as starch, gum etc., are degraded into water-soluble products, which are then easily removed by washing followed by Bleaching where the natural color of Grey fabric is removed and rendered white by treating it with sodium hydrochloride



or hydrogen peroxide. The purpose of mercerizing is to impart luster and strength to the fabric. During dyeing, a single shade is applied to the material, which can be a batch or continuous process. Heat setting is normally carried out in a Stenter to impart dimensional stability to synthetic fabric. The temperature and time for heat setting depends on the fabric count. Finishing process is done to improve the attractiveness of the fabric

Diesel-DG, Petcoke and Grid Electricity were used to operate major energy consuming equipments in the unit i.e. compressors, jiggers, stenter and other utilities i.e. pumps, motors associated with equipments, and lighting.

Overall Impact - Post implementation



Overall Impact

5.4% reduction in Total Energy bill (i.e. savings of INR 18 lakh p.a.) 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

Condensate Recovery from Drying Range, Jet Dyeing, Maxi & Zero Zero Machines

Baseline Scenario

The condensate from drying range, jet drying, maxi machines and zero zero machine was not being recovered. As a result, the pure condensate instead of using it as boiler feed water was being wasted and therefore the boiler feed water temperature was only 60°C. Non recoverable condensate leads to huge energy loss and affects overall efficiency of the boiler.

Recommendation

The unit was advised to recover the condensate and use it with feed water of the boiler using condensate recovery pipe line with insulation to minimize heat loss.

Implemented Scenario

Based on the project's recommendation, the unit installed a condensate recovery line with insulation to recover condensate from various machines.

Newly installed system saves 73 ton of fuel per annum.

The Investment of Rs.1.30 lakh made by the unit has resulted in monetary savings in energy cost of Rs.5.12 lakh per year with simple payback period of three months.

Insulation Over Steam line & Thermopack Surface

The Various steam lines were without insulation and the average surface temperature of each line was in the range of 60-210°C. As suggested, the unit has optimized the insulation of steam line to reduce skin losses. This has helped the unit to reduce heat losses and fuel consumption.

Performance Improvement of Thermopack by Oxygen Tuning

The % oxygen in flue gas is higher than the recommended value and % CO₂ monitored in flue gas is only 8.2% against the recommended value of at least 13% leading to heat loss. With the suggested recommendation, the unit has optimized the oxygen and CO₂ level. This has resulted in an annual energy saving of Rs. 1.66 lakh per year.

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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