

45% reduction in energy bill of a chemical MSME unit through Energy Efficiency Measures

Background

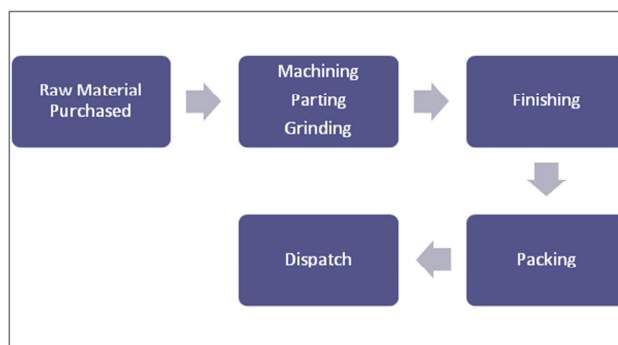
Ankleshwar is a Chemical cluster in Gujarat having over 700 MSMEs manufacturing various kinds of chemicals (dyes and pigments - 67%, pharma and pharma intermediates - 27%, and pesticides & chlor-alkalis - 6%). The production capacity of these units varies from 100 tonnes to 1000 tonnes per annum (tpa).

Unit Profile

M/s ABC is a MSME unit engaged in manufacturing of machined auto components producing about 1000 tpa. Total Energy bill of the unit was Rs.38.45 lakh per annum which was around 13% of total turnover. About 66% of the unit's energy bill was on account of Grid electricity and remaining 12.5% accounted for Diesel-DG.

Process description

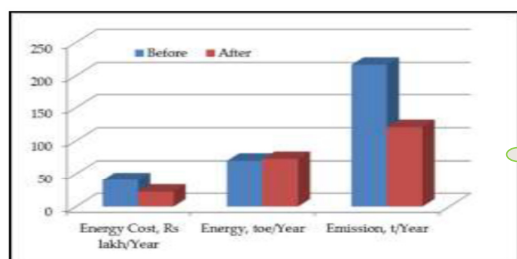
The manufacturing process involves the cutting of raw materials in the form of cylindrical rods with the help of band saw machines. The cut pieces are then machined in the lathe, drilling or traub machines into the required dimensions. The cut pieces either pre machined or machined directly in to CNC machines. Either 1 machine or series of CNC machines



are used to obtain the desired results. The single CNC machine can be used for various operations such as grinding, facing, turning, chamfering operations

Diesel and Grid Electricity were used to operate major energy consuming equipments in the unit i.e. CNC machines, grinding machines, lathe machines and other utilities i.e. pumps, motors associated with equipments, and lighting.

Overall Impact - Post implementation



Overall Impact
 45% reduction in Total Energy bill (i.e. savings of INR 4.2 lakh p.a.) Simple payback of 17 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

Replacement of the existing NG-fired TFH with wood/biomass briquette-fired TFH

Baseline Scenario

TFH with heating capacity of 400000 kcal/hour was consuming around 62,000 standard cubic metres (SCM) of NG annually and other utilities i.e. thermic fluid circulation pumps & agitator systems associated with the reaction vessels were consuming 16114 kWh/Yr. It was operating at 62% efficiency, which was relatively low due to High excess air-resulting in high flue gas heat loss, Inadequate insulation-leading to high heat loss from surface and incompatible burners-resulting in poor combustion efficiency.



Recommendation

The unit was advised to replace the existing NG-fired TFH with a energy efficient wood/biomass briquette-fired TFH.

Implemented Scenario

Based on the project's recommendation, the unit replaced NG-fired TFH with a wood/biomass briquette-fired TFH of same capacity.

Newly installed TFH consumes 217 MT of Briquettes per annum.



The Investment of Rs.9 lakh made by the unit has resulted in monetary savings in energy cost of Rs.18 lakh per year with simple payback period of six months.

Comment [p1]: Told by Mr. Sunil to leave this case study as it is because of the EPIA's

Installation of capacitor bank with APFC to improve power factor

The average power factor of the unit was low, at 0.930. As suggested, the unit has installed an additional capacitor bank with APFC panel 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 efficient fixtures by high efficient lighting fixtures

The unit was lighting the production area through T12 and T8 FTL lamps. With the suggested recommendation, the unit has replaced no. of T12& T8 FTL lamps with T5 tubes with electronic ballast. This has resulted in an annual energy saving of 3643 kWh of electricity, equivalent to about Rs. 24,000 per year with simple payback period of ten 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 TERI 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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