

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

Background

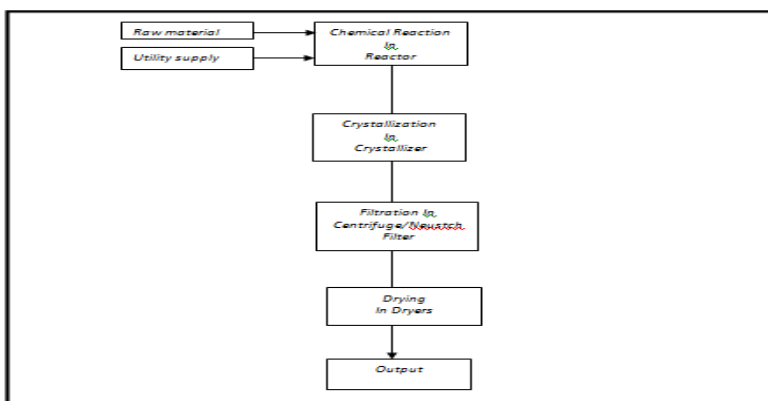
Faridabad is a mixed cluster in Haryana having over 12000 MSMEs majorly manufacturing various kinds of automobile parts, sheet metal components and fabrics. There are majorly 15 industrial segments in the cluster with a high range of products from soaps to tractors.

Unit Profile

M/s ABC is a MSME unit engaged in manufacturing of chemical blowing agents producing about 3900 tpa. Total Energy bill of the unit was Rs.122.8 lakh per annum. About 53% of the unit’s energy bill was on account of Thermal-Firewood, 33% accounted for Grid-Electricity and remaining 14% accounted for Diesel-DG.

Process description

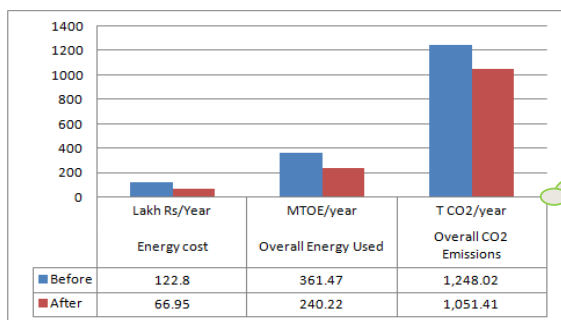
The manufacturing process involves the procurement of raw material in the form of chemicals to make DBH, DNPT and OBSC chemicals. DNPT is chemical compound named as Di-Nitroso Penta methylene tetra amine (DNPT). DBH is chemical compound named dopamine beta hydroxylase. OBSC is chemical compound named oxide bonded Silicon Carbide. There



are 3 types of reactors- DBH Reactor, DNPT Reactor and OBSC Reactor. Chemical reactions take place in these three reactors leading to formation of three different compounds. . After chemical reaction, the salt so obtained undergoes crystallization process in the crystallizers. Then it is subjected to filtration process in a centrifuge. The product is dried in ovens and dispatched to the clients.

Thermal-Firewood and Grid Electricity were used to operate major energy consuming equipments in the unit i.e. ammonia compressor, plant and machinery 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 68 lakh p.a.) Simple payback of 8 months

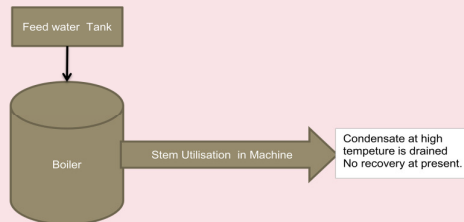
This case study has been prepared under WB GEF Project titled “Financing Energy Efficiency at MSMEs in India”. The project aims to identify, design & implement Energy Efficiency (EE) solutions in 500 MSMEs in 5 clusters with potential of EE investment of more than Rs. 100 crore and reduction in GHG emissions 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

Recovery of the condensate in Boiler

Baseline Scenario

The boiler was generating steam at a pressure of 6.0 kg/cm², at corresponding temperature of 164.18 deg C. No condensate recovery was there in the unit. The boiler feed water temperature was around 35 deg C which is almost at ambient condition. The corresponding enthalpy of feed water was around 36 kcal/kg which is very low, leading to high fuel consumption of 325 kg/ton of steam.



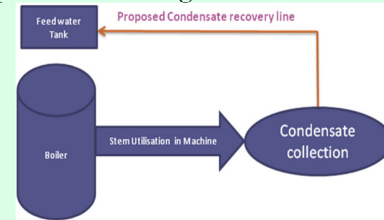
Recommendation

The unit was advised to recover the condensate by installing condensate recovery pipe line.

Implemented Scenario

Based on the project's recommendation, the unit installed condensate recovery system for the boiler

Newly installed system consumes 303 kg of fuel per ton of steam generation.



The Investment of Rs.1 lakh made by the unit has resulted in monetary savings in energy cost of Rs.2.7 lakh per year with simple payback period of five months.

Installation of Energy Monitoring System

The metering system in the unit was only at input level. As suggested, the unit has installed a metering system for all major equipments. This has helped the unit to improve in-house operational efficiency of the equipments.

Optimization of Power Factor

The average PF of the unit was 0.69. With the suggested recommendation, the unit installed an APFC panel to optimize the PF to 0.99. This has resulted in an annual energy saving of 167440 kVAh of electricity, equivalent to about Rs. 10.6 lakh per year with simple payback period of sixmonths.

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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