MSME chemical unit invests Rs 1 lakh in energy efficiency measures, recovers investment in 6 months!

Background

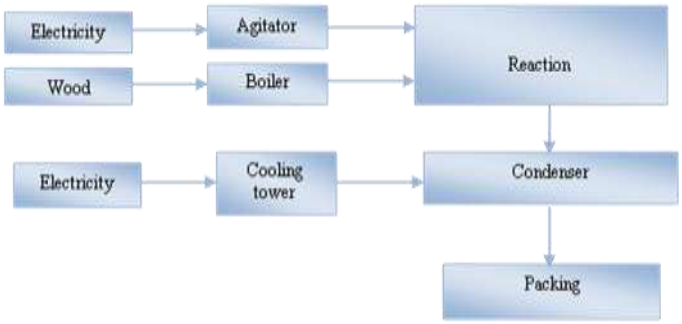
Ankleshwar is a chemical cluster in Gujarat. It has over 700 MSMEs manufacturing various kinds of chemicals (dyes and pigments—67%; pharma and pharma intermediates—27%; and pesticides and chlor-alkalis—6%). The production capacity of these units varies from 50 tonnes to over 10,000 tonnes per annum (tpa).

Unit profile

M/s **A12** is an MSME unit engaged in the manufacture of distilled solvents, producing about 120 tonnes per annum (tpa). The total annual energy bill of the unit was about INR 10 lakhs, which was around 26% of total turnover. The total annual energy consumption was 87 toe, of which wood accounted for 96% (84 toe) and grid electricity 4% (3 toe).

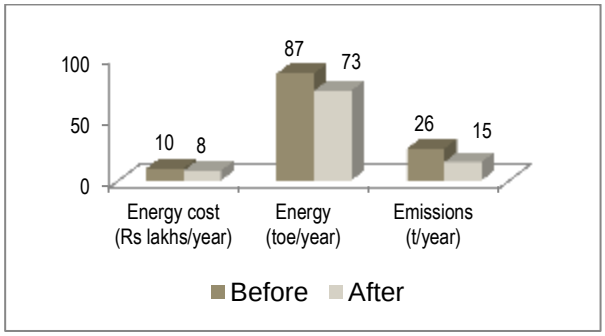
Process description

The manufacturing process involves reaction of the raw materials at high temperature, which is maintained by steam from a wood-fired boiler. The reactants are stirred to ensure uniform heat transfer. The output of the reaction vessel, in the form of vapor, is condensed to the liquid product by passing through a water-cooled condenser.



The major energy consuming areas in the unit were the wood-fired boiler, cooling tower, associated pumps and air compressor.

Overall Impact - Post implementation



Overall Impact

22% reduction in total energy bill (i.e. annual cost savings of INR 2 lakhs) with a simple payback of just 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 CO_2. This project is being co-implemented by Small Industries Development Bank of India (SIDBI) and Bureau of Energy Efficiency (BEE).

INTERVENTIONS

Renovation of boiler and associated systems

Baseline Scenario

The unit was operating a wood-fired boiler of 600 kg/hour capacity. The overall efficiency of the boiler was low (about 43%), mainly due to improper draft arrangement and leakages in the draft system and ID fan casing. The fuel handling system too was poor. The firewood was kept in the open even during the monsoon season, leading to high moisture content in the fired fuel.

Recommendation

The unit was advised to replace the two existing boilers with a single wood-fired boiler of IBR type having steam generation capacity of 2000 kg per hour.

Implemented Scenario

Based on the project's recommendation, the unit renovated the boiler and installed a fuel storage system.



This investment of Rs 0.73 lakh is saving about 39 tonnes of firewood annually, equivalent to INR 1.41 lakhs. The simple payback period is 6 months.

Replacement of process cooling water pump with energy efficient pump

The cooling water requirement of the three condenser units was being met by a submerged pump, which was drawing excessive power. As advised, the unit replaced it with an energy efficient pump. This investment of INR 0.21 lakh is saving 10,260 kWh of electricity annually, equivalent to INR 0.71 lakh. The simple payback period is 4 months.

Installation of power factor controller at main incomer

Analysis of electricity bills showed an average power factor of 0.66 at main incomer. A power factor controller was installed to improve the power factor to about 0.98. This investment of INR 6410 is saving INR 2880 annually. The simple payback period is 2.2 years.

Support provided under the project

- Walk-through&Detailed energy audit
- Identification of energy efficiency interventions in the unit
- Finalization of specifications for the energy efficiency interventions
- Identification of technology providers/vendors
- Facilitation for interactions between unit and technology providers
- Technical support during commissioning
- Monitoring & Verification

For further information please contact:
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