

MSME pharma unit saves 20% on energy bill through energy efficiency measures!

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).

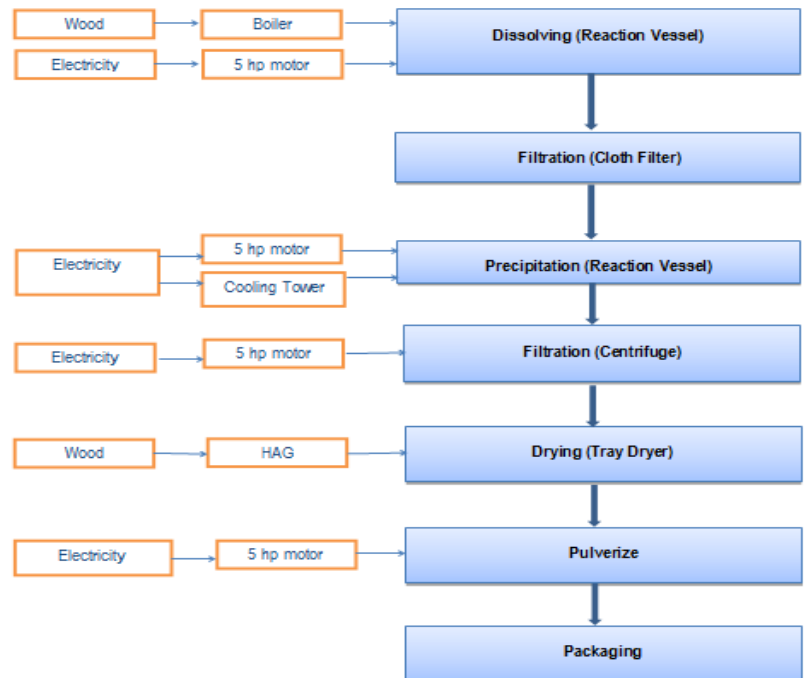
Unit profile

M/s A5 is an MSME unit that manufactures pharma intermediates, producing about 120 tonnes annually. The total annual energy bill of the unit was INR 11 lakhs, which was around 10% of turnover. The annual energy consumption was about 170 tonnes of oil equivalent (toe), of which natural gas (NG) accounted for 92% (69 toe), grid electricity 6% (5 toe), and diesel 2% (1 toe).

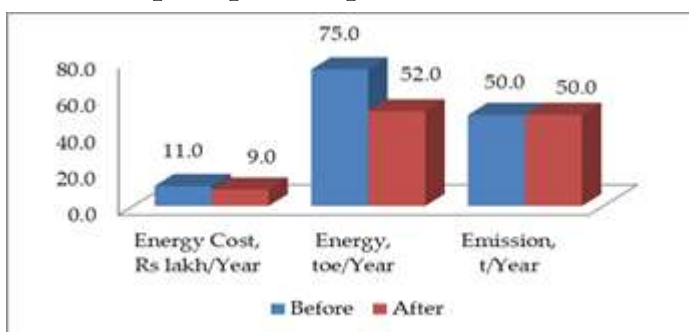
Process description

The pre-prepared batch materials are charged in a reaction vessel with suitable solvent, and made to react at a specific temperature, which is maintained using indirect heating by steam and cooling by chilled water from cooling tower. The mixture is continuously stirred to ensure uniform heat transfer. After reaction, the output of the reaction vessel is filtered using filter press or centrifuge, dried using tray dryers, and pulverized to give the final product.

The main energy consuming equipments being used were a wood-fired boiler of capacity 300 kg/hour steam, and electrical motors associated with pumps, agitators and centrifuges.



Overall Impact: post- implementation



Overall Impact

20% reduction in total energy bill (i.e. annual savings of INR 2.24 lakhs) with a simple payback of 34 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 existing wood-fired boiler with energy efficient wood-fired boiler of larger capacity

Baseline Scenario

The unit was operating a wood-fired boiler of capacity 300 kg/hour of steam, which had a very low efficiency of about 48%. Also, its capacity was insufficient to meet the plant's requirements for steam (for process heating and drying) and hot water.



Recommendation

The unit was advised to replace the existing wood-fired boiler with an energy efficient wood-fired boiler of higher capacity.

Implemented Scenario

Based on the project's recommendation, the unit replaced the existing boiler with an 800 kg/hour wood-fired boiler, with a design efficiency of 60%. The new boiler is able to meet the steam requirements for process heating & drying as well as hot water needs in batch preparation.

This investment of INR 6.3 lakhs is saving around 77 tonnes of fire wood annually, equivalent to INR 2.2 lakhs. The simple payback period is 2.8 years.

Installation of power factor controller at main incomer to improve the billing power factor

Analysis of electricity bills showed that the average power factor of the unit at main incomer was 0.943. As suggested, a power factor controller (PFC) was installed to improve the average power factor to about 0.99 at main incomer level to avoid penalty, maintain plant demand, reduce distribution losses and avoid fluctuations in voltage. This investment of INR 2489 is saving INR 1304 annually. The simple payback period is 1.9 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

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, these agencies will not be in any way liable for any inadvertent mistakes/omissions in the publication.

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