

MSME pharma unit reduces energy bill by 18% through energy efficiency measures—and recovers costs in 11 months!

Background

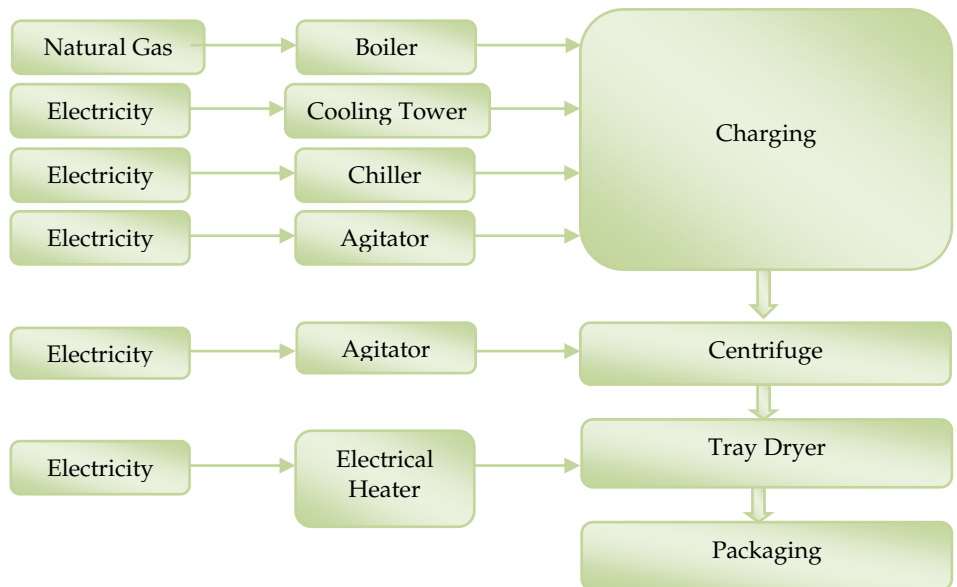
Ankleshwar is a chemical cluster in Gujarat. It has over 700 MSMEs manufacturing various kinds of chemicals (dyes and pigments—67%; pharma and pharma intermediates—27%; and pesticides and chlor-alkalis—6%). The production capacity of these units varies from 50 tonnes to over 10,000 tonnes per annum (tpa).

Unit profile

M/s **A13** is an MSME unit manufacturing nitro-chlorobenzoic acid and other bulk drug intermediates. The annual production is about 720 tonnes. The total annual energy bill of the unit was about INR 17 lakhs, which was around 10% of total turnover. The total annual energy consumption was about 36 tonnes of oil equivalent (toe), of which natural gas (NG) accounted for 57% (20 toe), diesel 27% (10 toe) and grid electricity 16% (6 toe).

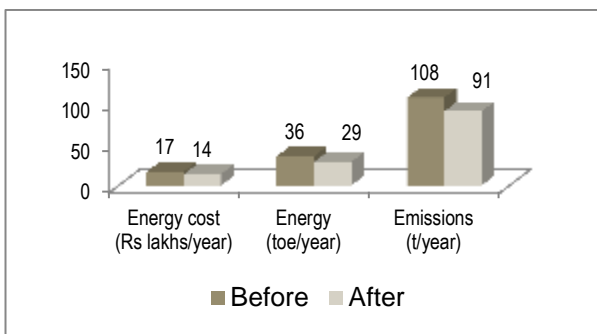
Process description

The raw materials are charged in a reactor which is maintained at a particular temperature, through indirect heating either by saturated steam from a boiler or by hot oil from a thermic fluid heater (TFH). The output of the reaction vessel is centrifuged and dried using a tray dryer to give the final product.



The major energy consuming equipments used were the NG-fired steam boiler and TFH, and electrical motors associated with cooling tower, pumps and other utilities.

Overall Impact: post- implementation



Overall Impact
 18% reduction in total energy bill (i.e. annual savings of INR 3 lakh) with a simple payback of 0.9 years

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

Reduction of flue gas losses by optimizing oxygen level; interlocking the boiler and boiler feed pump operation with pressure and water level indicator

Baseline Scenario

The unit was operating an NG-fired boiler of 300 kg/hour capacity. The oxygen level in the flue gas was nearly 14%, indicating energy loss due to excess air. Manual operation of feed pump system and ignition system added to operational inefficiency.

Recommendation

The unit was advised to optimize oxygen level in flue gas; install a flow level indicator interlocked with boiler feed pump system; and install an automatic ignition system interlocked with steam pressure.

Implemented Scenario

As advised, the unit optimized oxygen level in flue gas to about 3%, and installed a flow level indicator and automatic ignition system interlocked with boiler feed pump system and steam pressure respectively.

This investment of INR 60,000 saves 5752 SCM of NG annually, equivalent to INR 1.84 lakh. The simple payback period is 3 months.

Improvement in boiler combustion chamber to reduce heat surface losses

The existing boiler showed high surface heat losses due to lack of proper insulation. As advised, the unit enhanced insulation of the boiler shell and superheater zones. This investment of INR 0.4 lakh is saving 2060 SCM of NG annually, equivalent to INR 0.7 lakh. The simple payback period is six months.

Replacement of existing cooling tower with new natural draft cooling tower of 200 TR capacity

The unit was operating a locally fabricated natural draft cooling tower, which generated about 33 TR against the unit's requirement of up to 50–150 TR. As advised, the unit replaced it with a new natural draft cooling tower of 200 TR capacity. This investment of INR 1.48 lakhs saves 4025 kWh of electricity annually, equivalent to INR 0.27 lakh. The simple payback period is 5.5 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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