

MSME pharma unit invests Rs 12 lakhs in energy efficiency measures—and saves Rs 17 lakhs every year!

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).

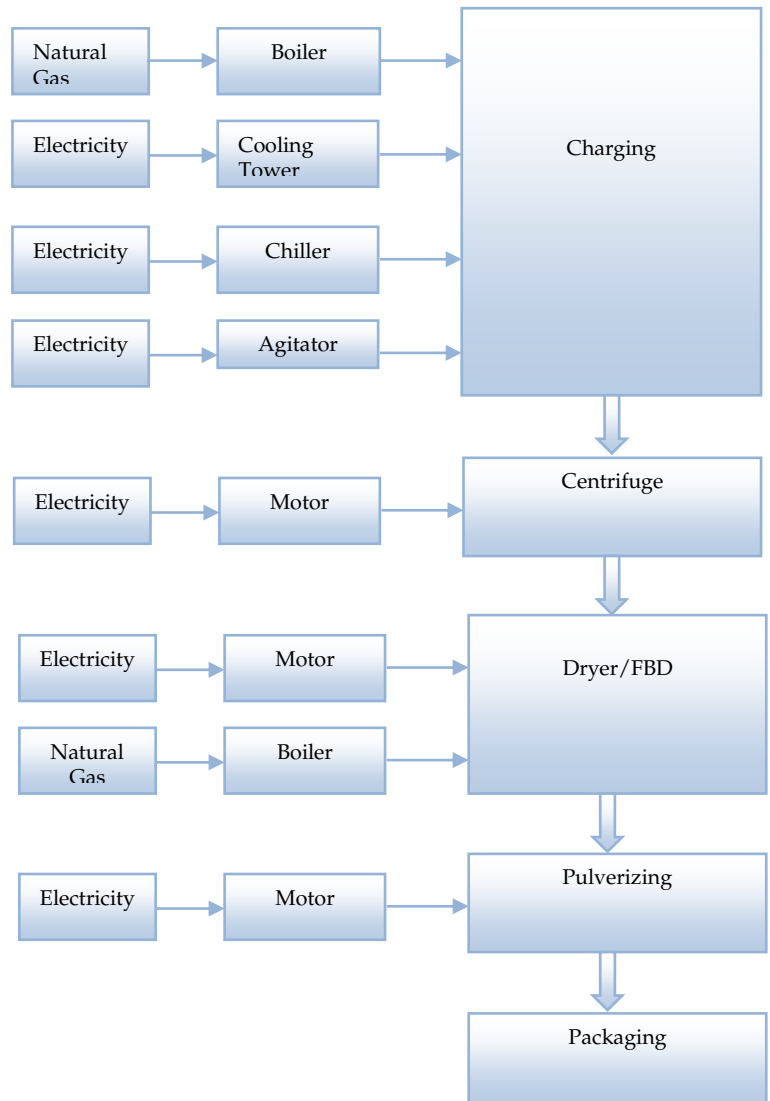
Unit profile

M/s A14 is an MSME unit manufacturing bulk drugs and intermediates. The annual production is about 144 tonnes. The total annual energy bill of the unit was about INR 135 lakhs, which was around 3% of total turnover. The total annual energy consumption was about 275 tonnes of oil equivalent (toe), of which natural gas (NG) accounted for 82% (223 toe) and grid electricity 18% (52 toe).

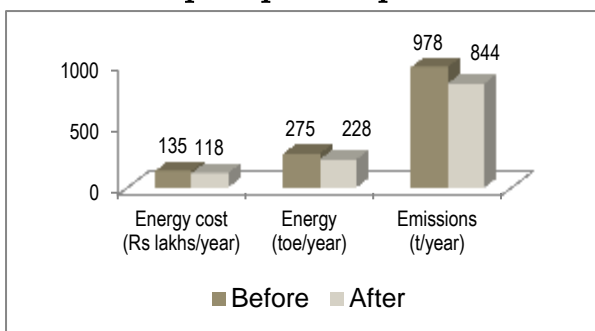
Process description

The raw materials are charged in a reaction vessel, which is heated or cooled as required, using steam from NG-fired boilers or chilled water from cooling tower/chiller. The mixture is continuously stirred to ensure uniform heat transfer. After reaction, the output of the reaction vessel is centrifuged, dried in a fluid bed dryer (FBD), and pulverized to give the final product.

The major energy consuming equipments used were two NG-fired steam boilers and electrical motors associated with agitator, cooling tower, pumps and other utilities.



Overall Impact: post- implementation



Overall Impact
 12% reduction in total energy bill (i.e. annual savings of INR 17 lakhs) with a simple payback of 7 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 NG-fired steam generation system by NG-fired thermic fluid heater

Baseline Scenario

The unit was operating two NG-fired steam boilers: one of 850 kg/hr capacity during normal operations, and the other of 600 kg/hr capacity to meet additional steam demand during peak production. The efficiency of the 850 kg/hr boiler was only low (about 69%) due to design deficiencies. The overall efficiency dropped further when both boilers were in use.



Recommendation

The unit was advised to replace the existing steam-based heating system with an NG-fired thermic fluid heater (TFH) system.

Implemented Scenario

As advised, the unit replaced the two steam boilers with an NG-fired TFH of capacity 400,000 kCal/hour. The TFH reduces NG consumption by about 8.7 SCM/hour for the same output.



This investment of INR 10.4 lakhs saves about INR 15.2 lakhs annually. The simple payback period is 0.7 years (i.e. nine months).

Replacement of all condenser water pumps with a single energy efficient pump with VFD

The unit was using four water pumps to serve the condensers. Their average efficiency was only about 28%. As advised, the unit replaced all four pumps with a single energy efficient pump with a variable frequency drive (VFD) that helps save energy during reduced loading periods. This investment of INR 0.97 lakh is saving 18,720 kWh of electricity annually, equivalent to INR 1.3 lakhs. The simple payback period is 0.8 year.

Improvement of power factor

The unit had installed an automatic power factor controller (APFC) bank of total capacity 135 kVAR. It was observed that some of the banks, with total capacity 85 kVAR, were faulty. As advised, the unit replaced these faulty capacitor banks. This investment of INR 13,346 is saving INR 6259 annually. The simple payback period is 2.1 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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