

MSME pharma unit invests Rs 13 lakhs in energy efficiency measures—and saves Rs 12 lakhs annually!

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).

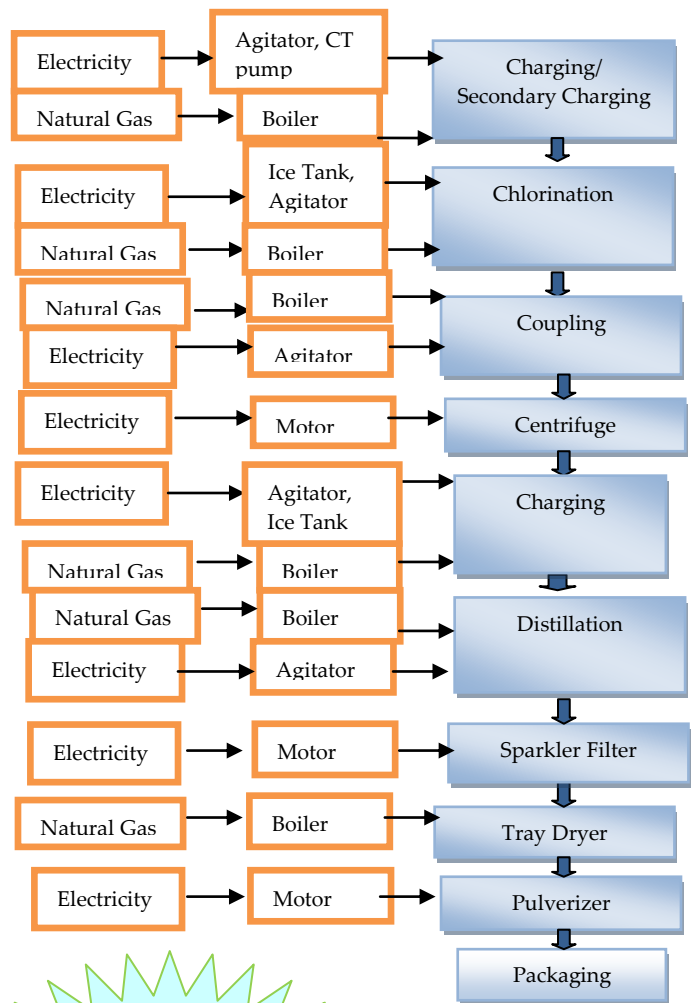
Unit profile

M/s A25 is an MSME unit manufacturing pharma intermediates. The annual production is about 60 tonnes. The total annual energy bill of the unit was about INR 43 lakhs, which was around 17% of total turnover. The total annual energy consumption was about 87 tonnes of oil equivalent (toe), of which natural gas (NG) accounted for 83% (72 toe) and grid electricity 17% (15 toe).

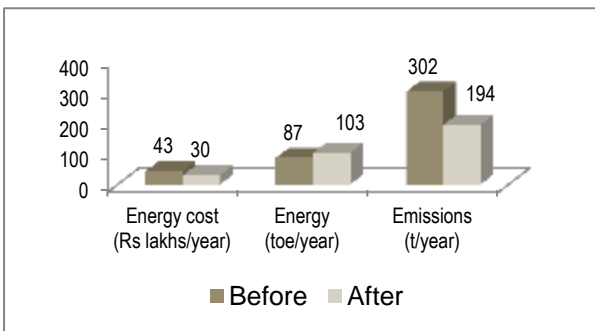
Process description

The raw materials are charged in a reaction vessel, which is indirectly heated or cooled as required, using steam from an NG-fired boiler or ice/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, distilled, filtered using sparkler filter, dried in tray dryers, and pulverized to give the final product.

The main energy consuming equipments used were a NG-fired boiler and electrical motors associated with agitator, cooling tower pumps, FBD and other utilities.



Overall Impact: post- implementation



Overall Impact
 29% reduction in total energy bill (i.e. annual savings of over INR 12 lakhs) with a simple payback of 1.1 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

Replacement of existing NG-fired boiler by wood-fired IBR boiler of larger capacity

Baseline Scenario

The existing boiler of 600 kg/hour steam generation capacity was NG-fired and of non-IBR type. Its efficiency was low (74%) mainly due to high dry flue gas losses.

Recommendation

The unit was advised to replace the existing with a wood-fired IBR boiler of 1000 kg/hour steam generation capacity.

Implemented Scenario

As advised, the unit replaced the existing boiler with a wood-fired IBR boiler of capacity 1000 kg/hour. This investment of INR 11 lakhs has increased electricity and wood consumption by 63,900 kWh and 257 tonnes respectively, but saves 84,513 SCM of NG annually.



The overall annual saving is INR 11.1 lakhs, giving a simple payback period of one year.

Installation of VFD for cooling tower pump

The 7.5 kW cooling tower pump had a satisfactory efficiency of 62%, but provided a constant flow, irrespective of the flow requirement of the process. As advised, the unit installed a variable frequency drive (VFD) on the pump to control and optimize the flow. This investment of INR 1 lakh is saving around 11,258 kWh annually, equivalent to INR 0.8 lakh. The simple payback period is 1.3 years.

Installation of energy saving star delta convertor for motors

Electrical motors are used on centrifuge and reaction vessel for filtration and mixing respectively. The load on these motors varies during the day. As advised, the unit installed an automatic star delta convertor which optimizes the efficiency of motor operation under variable loads. This investment of INR 0.3 lakh is saving INR 0.1 lakh annually. The simple payback period is three years.

Replacement of existing lighting with energy efficient lighting

Tests conducted on the unit's air compressor revealed that the air suction filter was completely choked. This reduced its energy efficiency. As advised, the unit is conducting regular maintenance on the suction filter. This investment of INR 4000 is saving INR 13,000 annually in electricity costs. The simple payback period is four months.

**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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