

# MSME pharma unit reduces energy bill by 16% through investment in 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).

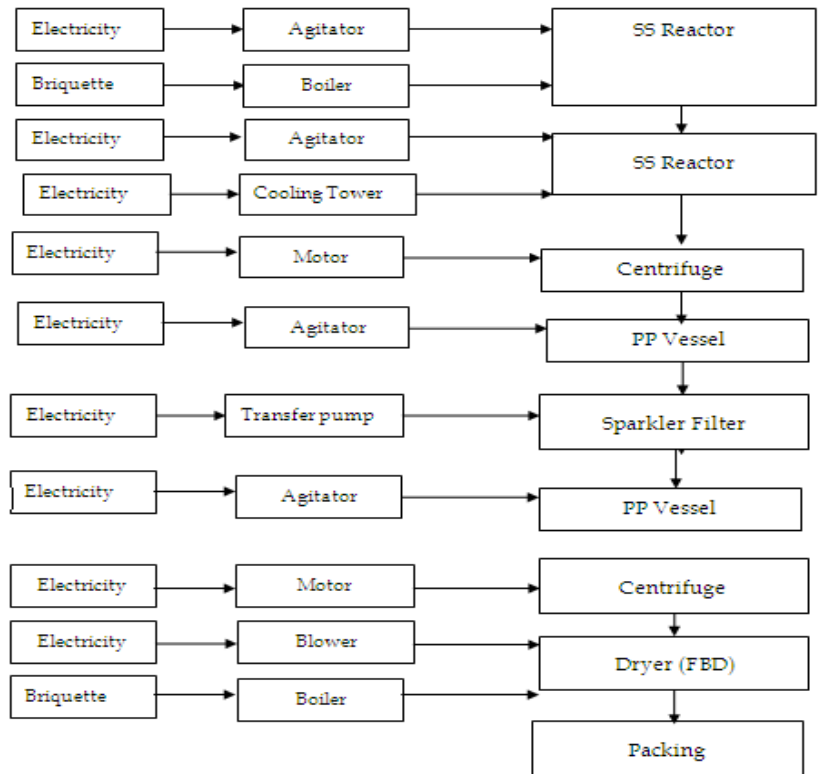
## Unit profile

M/s **A22** is an MSME unit manufacturing active pharma ingredients. The annual production is about 720 tonnes. The total annual energy bill of the unit was about INR 34 lakhs, which was around 10% of total turnover. The total annual energy consumption was about 136 tonnes of oil equivalent (toe), of which firewood accounted for 81% (110 toe) and grid electricity 19% (26 toe).

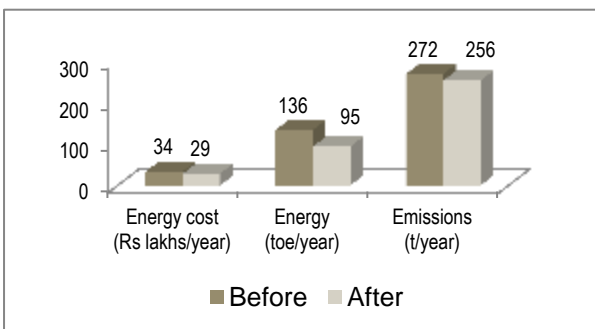
## Process description

The manufacturing process involves reaction of the raw materials at a particular temperature, which is maintained through indirect heating by steam from a boiler. The reaction products are centrifuged and dried in a fluidized bed dryer (FBD) to give the final products.

The major energy consuming equipments were a biomass briquette-fired boiler; electrical motors associated with pumps, agitators and air compressor; and lighting.



## Overall Impact: post- implementation



**Overall Impact**  
 16% reduction in total energy bill (i.e. annual savings of INR 5 lakhs) with a simple payback of 2.2 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 CO<sub>2</sub>. This project is being co-implemented by Small Industries Development Bank of India (SIDBI) and Bureau of Energy Efficiency (BEE).*

## INTERVENTIONS

### Replacement of existing boiler with IBR type boiler of larger capacity

#### Baseline Scenario

The unit was operating a biomass briquette-fired, non-IBR boiler of capacity 800 kg/hour. Its operational efficiency was low (about 57%) due to high dry flue gas losses and surface losses.



#### Recommendation

The unit was advised to replace the existing boiler with an IBR boiler of capacity of 1000 kg per hour steam generation.

#### Implemented Scenario

As advised, the unit replaced the existing boiler with an IBR boiler of capacity 1000 kg/hour capacity.

This investment of INR 9.4 lakhs is saving 56.1 tonnes of biomass briquettes annually, equivalent to INR 3.1 lakhs. The simple payback period is 3 years.

### Installation of energy efficient lighting

The unit was using a mix of mercury vapour lamps (MVLs), CFLs, tube lights (FTLs) and incandescent lamps for illumination. As advised, the unit has replaced these with energy efficient lighting such as LED lamps and CFLs. This investment of INR 0.9 lakhs is saving 12,495 kWh of electricity annually, equivalent to INR 0.8 lakh. The simple payback period is 1.1 years.

### Installation of VFD on cooling tower pump

The cooling water circulation pump was being operated continuously, even though the cooling load is variable. This led to considerable wastage of energy. As advised, the unit has retrofitted the pump with a variable frequency drive (VFD) to synchronize pump operation with cooling load variation. This investment of INR 0.7 lakh is saving 5998 kWh of electricity annually, equivalent to INR 0.43 lakh. The simple payback period is 1.8 years.

### Power factor correction

Analysis of electricity bills showed that the average power factor at main incomer was 0.772. As advised, the unit installed load-end capacitor banks of 65 kVAR to minimize the reactive charges. This investment of INR 0.3 lakh is saving INR 0.2 lakh annually. The simple payback period is 1.5 years.

### Installation of steam traps

The unit uses steam for indirect heating in the reaction vessels and FBD. As advised, the unit installed steam traps at all condensate recovery points to reduce steam losses. This investment of INR 0.2 lakh is saving 14 tonnes of briquettes annually, equivalent to INR 0.8 lakh. The simple payback period is 0.3 year.

#### 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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