

## MSME chemical unit invests 3.5 lakhs on energy efficiency measures, recovers costs in less than 3 years!

### Background

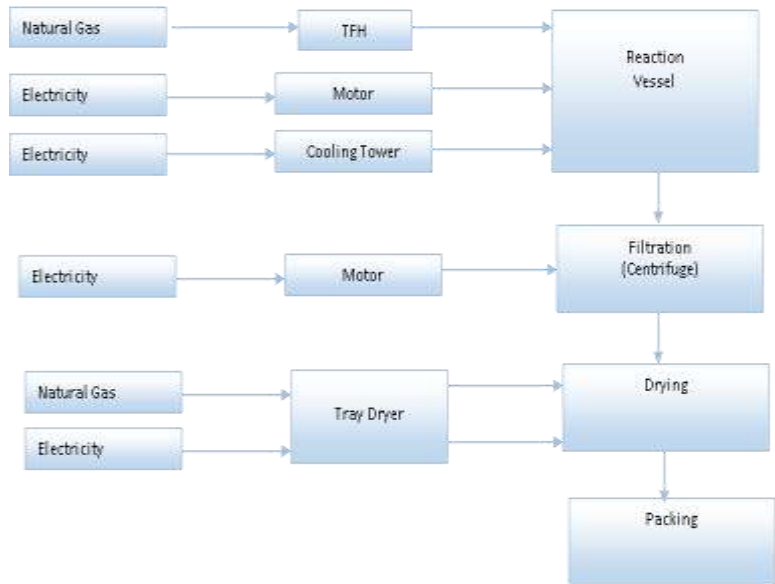
Ankleshwar is a chemical cluster in Gujarat. It has over 700 MSMEs manufacturing various kinds of chemicals (dyes and pigments—67%; pharma and pharma intermediates—27%; and pesticides and chlor-alkalis—6%). The production capacity of these units varies from 50 tonnes to over 10,000 tonnes per annum (tpa).

### Unit profile

M/s A3 is an MSME unit manufacturing Metol, a photochemical. The annual production is about 65 tonnes. The total annual energy bill of the unit was about INR 12 lakhs, which was around 15% of total turnover. The total annual energy consumption was about 24 tonnes of oil equivalent (toe), of which natural gas (NG) accounted for 82% (20 toe) and grid electricity 18% (4 toe).

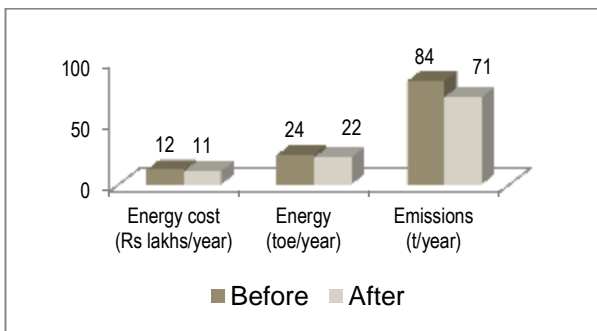
### Process description

The raw materials are charged in a reaction vessel and made to react at a high temperature, which is maintained by an NG-fired thermic fluid heater (TFH). After the desired temperature is reached, the thermic fluid is circulated through a heat exchanger (cooling tower) which meets the cooling requirements of the process. The output of the primary vessel is filtered using a filter press or centrifuge, and then dried using a tray dryer to give the final product.



The main energy consuming equipments used by the unit were TFH of 100,000 kCal/hour capacity, tray dryer, cooling tower, and the associated pumps and centrifuges.

### Overall Impact: post-implementation



**Overall Impact**  
 10% reduction in total energy bill (i.e. annual savings of INR 1.3 lakhs) with a simple payback of 2.8 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 cooling arrangement by new natural draft cooling tower

#### Baseline Scenario

The unit was using a sprinkler and tank arrangement to meet process cooling requirements. This system was found to be delivering a cooling load of only 6.3 TR, resulting a higher batch time.



#### Recommendation

The unit was advised to replace the existing sprinkler arrangement with a new natural draft cooling tower for delivering better cooling to the process.

#### Implemented Scenario

Based on the project's recommendation, the unit replaced the existing sprinkler and tank cooling system with a new natural draft cooling tower.



This investment of INR 93,433 is bringing about annual electricity saving of 5028 kWh, equivalent to INR 34,919. The simple payback period is 2.7 years.

### Installation of VFD on centrifuge

The centrifuge used for filtration was being operated continuously at uniform speed. As suggested, a variable frequency drive (VFD) was installed to enable operation at different speeds during each batch. This investment of INR 1.65 lakhs saves 7609 kWh of electricity annually, equivalent to INR 0.53 lakhs. The simple payback period is 3.1 years.

### Replacement of existing burner in TFH with energy efficient burner

The TFH burner was of fixed flow type and did not have air to fuel ratio controller, leading to high energy losses. As suggested, it has been replaced by an automatic two stage energy efficient burner. This investment of INR 90,522 saves 1015 SCM of NG annually, equivalent to INR 37,304. The simple payback period is 2.4 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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