

**MSME chemical unit slashes energy bill by 62% through energy efficiency measures— and recovers investment in 5 months!**

**Background**

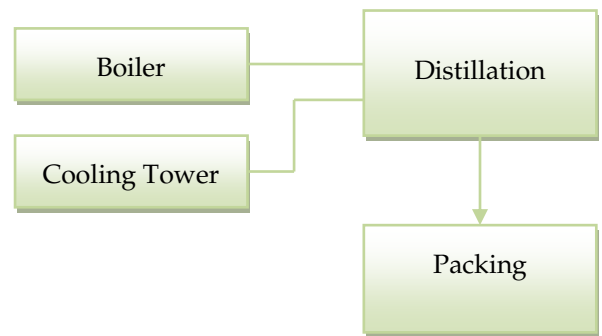
Ankleshwar is a chemical cluster in Gujarat. It has over 700 MSMEs manufacturing various kinds of chemicals (dyes and pigments—67%; pharma and pharma intermediates—27%; and pesticides and chlor-alkalis—6%). The production capacity of these units varies from 50 tonnes to over 10,000 tonnes per annum (tpa).

**Unit profile**

M/s **A18** is an MSME unit that manufactures industrial solvents producing about 3000 tpa. The annual energy bill of the unit was INR 37 lakhs, which was around 7% of total turnover. The annual energy consumption was around 67 tonnes of oil equivalent (toe), of which natural gas (NG) accounted for 59 toe (88%) and grid electricity 8 toe (12%).

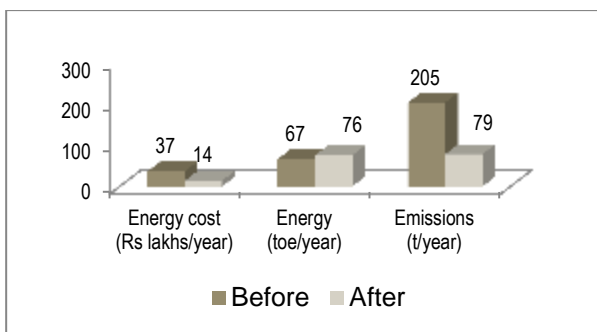
**Process description**

The manufacturing process involves reaction of the raw materials at a particular temperature, which is maintained by circulation of hot thermic fluid from a thermic fluid heater (TFH) around the jacket of the reaction vessel. The products of reaction are distilled, and the vapours are condensed using chilled water from a cooling tower to give the final product.



The major energy consuming equipments used were the NG-fired TFH and electrical motors associated with process equipment such as cooling tower pumps, etc.

**Overall Impact: post-implementation**



**Overall Impact**  
 62% reduction in total energy bill (i.e. annual savings of INR 23 lakhs) with a simple payback of 5 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 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 NG-fired TFH with energy efficient solid fuel-fired TFH

#### Baseline Scenario

The unit was operating an NG-fired TFH of 4 Lakh kCal/hour capacity. The efficiency of the TFH was estimated to be about 81.5%, with energy lost through dry flue gases on account of low combustion efficiency.



#### Recommendation

The unit was advised to replace the existing NG-fired TFH with an energy efficient solid fuel-fired TFH of 4 lakh kCal/hour capacity.

#### Implemented Scenario

As advised, the unit has replaced the existing TFH with a biomass briquette-fired TFH of 4 lakh kCal/hour capacity. The new system consumes about 6250 kWh of electricity and 157 tonnes of biomass briquettes, but saves 69960 SCM of NG annually.

This investment of INR 8.7 lakhs is saving INR 21.9 lakhs annually. The simple payback period is 0.4 year, i.e. just five months.

### Replacement of inefficient cooling tower pump with energy efficient pump

The operating efficiency of the electrical pump installed on the cooling tower was found to be only about 30%, which is low in comparison to the standard operating efficiency of pumps of similar capacity. As advised, the unit has replaced this pump with a pumping system of higher efficiency (57%) available in the local market. This investment of INR 0.4 lakh is saving about 10,500 kWh of electricity annually, equivalent to INR 0.7 lakh. The simple payback period is 0.5 year, i.e. six 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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