

**MSME chemical unit reduces energy bill by 17% through energy efficiency measures, saves more than Rs 1 lakh annually!**

**Background**

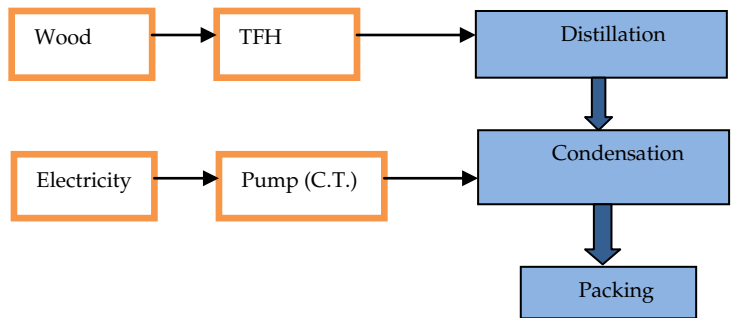
Ankleshwar is a chemical cluster in Gujarat. It has over 700 MSMEs manufacturing various kinds of chemicals (dyes and pigments—67%; pharma and pharma intermediates—27%; and pesticides and chlor-alkalis—6%). The production capacity of these units varies from 50 tonnes to over 10,000 tonnes per annum (tpa).

**Unit profile**

M/s A8 is an MSME unit that manufactures acetic acid, formic acid and sodium sulphate, producing about 475 tonnes annually. The total annual energy bill of the unit was INR 7 lakhs, which was around 9% of turnover. The annual energy consumption was about 57 tonnes of oil equivalent (toe), of which firewood accounted for 97% (55 toe) and grid electricity 3% (2 toe).

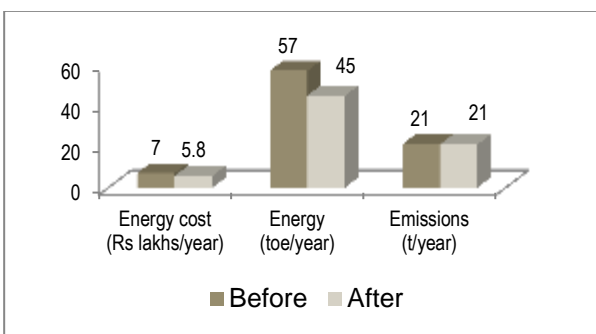
**Process description**

The manufacturing process involves reaction of the raw materials at high temperature, which is maintained by circulation of hot oil from a thermic fluid heater (TFH) through the jacket of the reactor. The output of the primary vessel, in the form of vapor, is condensed to the liquid product by passing through a water-cooled condenser.



The main energy consuming equipments used were a wood-fired TFH of 70, 000 kcal/hour capacity, and electrical motors associated with utilities like pumps.

**Overall Impact: post- implementation**



**Overall Impact**  
 17% reduction in total energy bill (i.e. annual savings of INR 1.2 lakhs) with a simple payback of 14 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

Modification in the TFH system by reconstruction of furnace chamber, replacement of TFH shell and insulation of the shell

### Baseline Scenario

The unit was operating a wood-fired TFH of 70,000 kCal/hour capacity. High energy losses took place through flue gas in the absence of a chimney or induced draft/forced draft fan. Further energy losses resulted from leaks in the heat exchanger and poor insulation.



#### Recommendation

The unit was advised to replace the existing heat exchanger section and install a chimney to create a natural draft system for proper combustion.

### Implemented Scenario

As advised, the unit carried out modification in the TFH system by reconstruction of furnace chamber, replacement of TFH shell and insulation of the shell. This has increased the heat transfer rate in the heat exchanger and ensured controlled combustion in the combustion chamber.



This investment of INR 1.4 lakhs is saving about 37 tonnes of firewood annually, equivalent to INR 1.2 lakhs. The simple payback period is 1.2 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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