

# MSME chemical unit invests 9 lakhs for improving energy efficiency—and saves 18 lakhs annually!

## Background

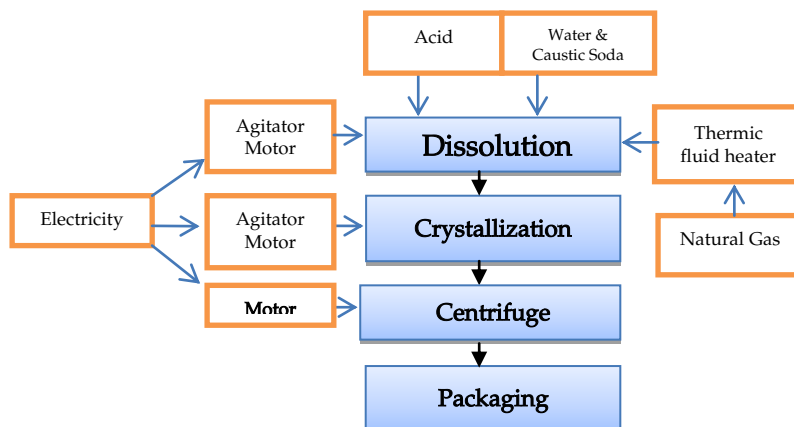
Ankleshwar is a chemical cluster in Gujarat. It has over 700 MSMEs manufacturing various kinds of chemicals (dyes and pigments—67%; pharma and pharma intermediates—27%; and pesticides and chlor-alkalis—6%). The production capacity of these units varies from 50 tonnes to over 10,000 tonnes per annum (tpa).

## Unit profile

M/s **A4** is an MSME unit that manufactures organic and inorganic salts such as sodium formate, sodium acetate, etc., producing about 1000 tpa. The annual energy bill of the unit was INR 40.5 lakhs, which was around 13% of total turnover. The annual energy consumption was around 70 tonnes of oil equivalent (toe), of which natural gas (NG) accounted for 61 toe (87%) and grid electricity 9 toe (13%).

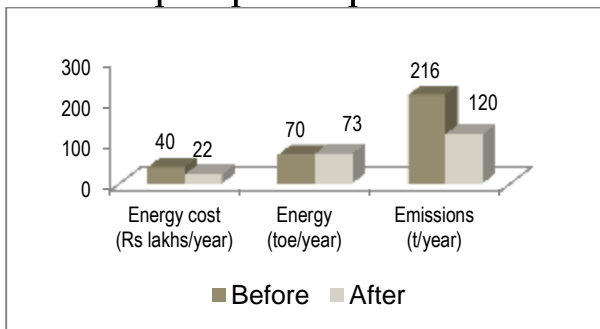
## Process description

The pre-mixed batch materials are charged in a reaction vessel and made to react at a specific temperature, which is maintained by an NG-fired thermic fluid heater (TFH). After reaction, the contents are transferred to an open container for cooling and crystallization. The crystals are separated in the form of wet cakes, and their moisture content reduced by filter press or by centrifuge before being packed for dispatch.



The major energy consuming equipments used were the NG-fired TFH with a heating capacity of 400,000 kcal/hour, and electrical motors associated with utilities like pumps, agitators, centrifuges, etc.

## Overall Impact: post- implementation



**Overall Impact**  
 45% reduction in total energy bill (i.e. annual savings of INR 18 lakhs) with a simple payback of 6 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 wood/biomass briquette-fired TFH

#### Baseline Scenario

The existing NG-fired TFH, with heating capacity of 400,000 kcal/hour, was consuming 62,000 SCM of NG annually and operating at a relatively low efficiency of 62%. This was due to high flue gas heat losses, inadequate insulation, poor combustion efficiency, etc.



#### Recommendation

The unit was advised to replace the NG-fired TFH with an energy efficient wood/biomass briquette-fired TFH.

#### Installation of capacitor bank to improve power factor

The average power factor of the unit was low, at 0.940. As suggested, the unit has installed a fixed capacitor bank to improve the power factor to about 0.995. This investment of INR 12,000 is saving about INR 2000 annually. The simple payback period is 4.6 years.

#### Implemented Scenario

Based on the project's recommendation, the unit replaced the NG-fired TFH with a wood/biomass briquette-fired TFH of same capacity. The new TFH uses 217 tonnes of briquettes and 16,114 kWh of electricity annually, but saves 62,000 SCM of NG.



This investment of INR 9 lakhs is saving INR 18 lakhs annually in energy costs. The simple payback period is six months.

#### Replacement of mercury vapour lamps by metal halide lamps

The unit was using five 160-W mercury vapour lamps to light up the production area. As suggested, these have been replaced by five 70-W metal halide lamps. This investment of INR 6750 is saving 1767 kWh of electricity annually, equivalent to INR 11,700. The simple payback period is seven 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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