MSME chemical unit invests Rs 2 lakh on energy efficiency measures, recovers cost in less than a year!

Background

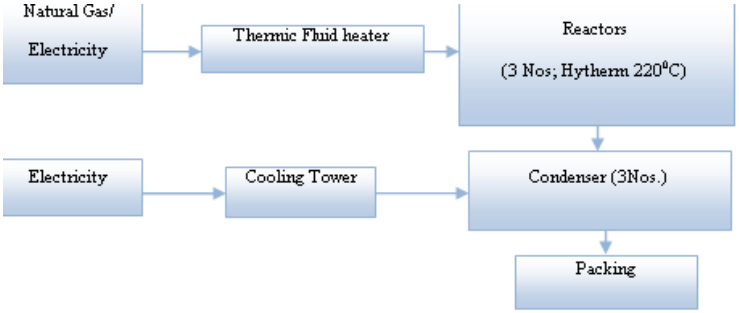
Ankleshwar is a chemical cluster in Gujarat. It has over 700 MSMEs manufacturing various kinds of chemicals (dyes and pigments—67%;pharma and pharma intermediates—27%; and pesticides and chlor-alkalis—6%). The production capacity of these units varies from 50 tonnes to over 10,000 tonnes per annum (tpa).

Unit profile

M/s **A11** is an MSME unit manufacturing resins and veneers. The annual production is about 240 tonnes. The total annual energy bill of the unit was about INR 28 lakhs, which was around 9% of total turnover. The total annual energy consumption was about 51 tonnes of oil equivalent (toe), of which natural gas (NG) accounted for 90% (46 toe), grid electricity 8% (4 toe), and diesel 2% (1 toe).

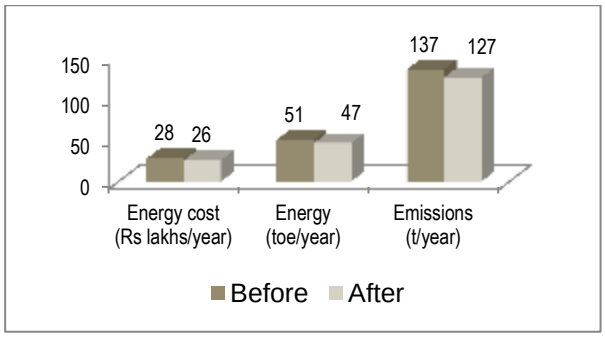
Process description

The raw materials are charged in a reaction vessel and made to react at a specific temperature, which is maintained through indirect heating by a thermic fluid heater (TFH), or cooling by chilled water from a cooling tower. The vapours from the reaction vessel are cooled in condensers to give the final liquid products.



The major energy consuming equipments used were the NG-fired TFH, electrical motors associated with cooling tower and other utilities, and lighting.

Overall Impact: post- implementation



Overall Impact

7% reduction in total energy bill (i.e. annual savings of over INR 2 lakh) with a simple payback of 0.9 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_2. This project is being co-implemented by Small Industries Development Bank of India (SIDBI) and Bureau of Energy Efficiency (BEE).

INTERVENTIONS

Installation of energy efficient burner system to optimize combustion in TFH

Baseline Scenario

The unit was operating an NG-fired TFH whose efficiency was low (73%), because its manual-type burner did not allow control over flow of NG and combustion air.

Recommendation
The unit was advised to install an automatic energy efficient burner

Implemented Scenario

As advised, the unit installed an automatic energy efficient burner that allows control over flow of NG and combustion air.

This investment of INR 1.11 lakhs is saving about 4080 SCM of NG annually, equivalent to a monetary saving of INR 1.84 lakhs. The simple payback period is just six months.

Replacement of existing cooling tower by FRP cooling tower

The unit was operating a locally fabricated pond-based cooling tower of 13 TR capacity. Its efficiency was very low (12%). The unit has also installed a new reactor to increase production. As advised, the unit has replaced the existing cooling tower by a fibre-reinforced plastic (FRP) cooling tower of 100 TR capacity. This investment of INR 66,470 saves about 1752 kWh of electricity annually, equivalent to INR 13,170. The simple payback period is 5 years.

Installation of load end capacitor bank to minimize reactive charges

Analysis of electricity bills showed that the average power factor at main incomer was 0.825. The unit had installed an all-total capacity of 20 kVAr, of which capacitor banks of 10 kVAr were not working properly. As advised, the faulty capacitor banks were replaced to minimize the reactive charges, and a 10 kVAr capacitor bank was added at main incomer. This investment of INR 8547 is saving INR 4305 annually. The simple payback period is 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

For further information please contact:
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