

MSME forging unit reduces energy bill by 23% through energy efficiency measures

Background

Pune, in Maharashtra, is a forging industry cluster. Large-scale units account for about 65–70% of the cluster’s forging production, while MSMEs account for the remaining 30–35%. There are over 50 MSMEs producing forged components, with 20 heat treatment MSMEs functioning as their vendors. The production capacity of these units varies from 500 tonnes to over 3500 tonnes per annum (tpa).

Unit profile

M/s P4 is an MSME unit that undertakes heat treatment of forged automobile and engineering components (job works), producing about 918 tpa. The annual energy bill of the unit was INR 62 lakhs, which was around 42% of total turnover. The annual energy consumption was around 106 tonnes of oil equivalent (toe), of which furnace oil (FO) accounted for 83% (88 toe), grid electricity 15% (16 toe), and diesel 2% (2 toe).

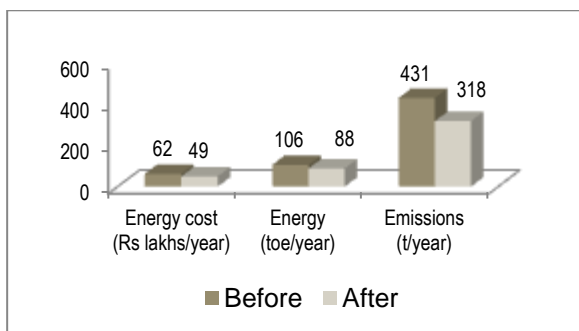
Process description

The components requiring heat treatment are cleaned and degreased, fitted on to appropriate fixtures, and then subjected to heat treatment processes like hardening, tempering, nitrating and annealing to give the final products.

The major energy consuming equipments used were nine furnaces for hardening, tempering, nitriding etc., of which three were electricity-powered and six were FO-fired; and electrical motors associated with process equipment such as air compressor, pumps, etc.



Overall Impact: post-implementation



Overall Impact
 23% reduction in total energy bill (i.e. annual savings of INR 15 lakhs) with a simple payback of 1.5 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 CO₂. This project is being co-implemented by Small Industries Development Bank of India (SIDBI) and Bureau of Energy Efficiency

INTERVENTIONS

Fuel switching from furnace oil to natural gas for three heat treatment furnaces

Baseline Scenario

Among the FO-fired heat treatment furnaces being used by the unit, three were found to have low efficiencies of 7.8%, 4.7% and 8.8%.



Recommendation

As natural gas (NG) supply was readily available, the unit was advised to switch from FO to NG as fuel for these three heat treatment furnaces.

Implemented Scenario

As recommended, the unit switched from using FO to NG as fuel for three of its heat treatment furnaces. Together, these three furnaces now consume about 83,260 SCM of NG annually, but save about 89,630 litres of FO.



This investment of INR 22.1 lakhs saves INR 13.3 lakhs annually. The simple payback period is 1.7 years.

Relining of hardening furnace to reduce surface heat loss

One of the hardening furnaces (earlier fired by FO, now by NG) showed high surface heat loss (about 11,200 kCal/hour) due to damaged refractory lining. As advised, the unit undertook relining of the furnace to cut down on surface heat losses. This investment of INR 0.4 lakh is saving about 3150 SCM of NG annually, equivalent to INR 1.3 lakhs. The simple payback period is 0.3 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.

For further information please contact:

Energy Efficiency Centre, Small Industries Development Bank of India (SIDBI), Ground Floor, E-1, Videocon Tower, Jhandewalan Extension, Rani Jhansi Road, New Delhi-110055, India, Ph. 011 23682473-77, www.sidbi.in

