

MSME forging unit reduces energy bill by 35% through energy efficiency improvements

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).

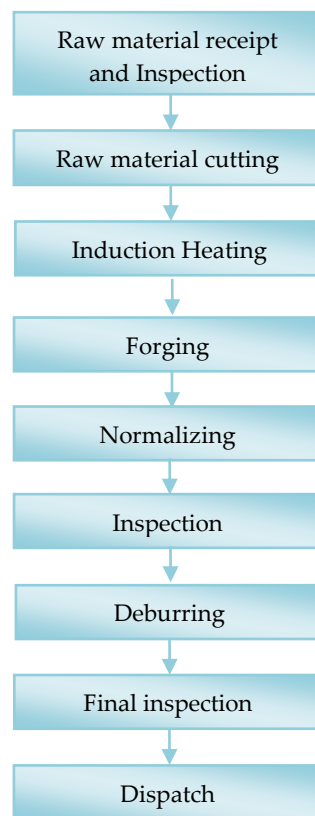
Unit profile

M/s P9 is an MSME unit that manufactures forged components like gears and shafts, producing about 3600 tonnes annually. The total annual energy bill of the unit was INR 344 lakhs, which was around 5% of turnover. The annual energy consumption was about 573 tonnes of oil equivalent (toe), of which furnace oil (FO) accounted for 55% (317 toe), light diesel oil (LDO) 25% (143 toe), grid electricity 19% (110 toe), and diesel 1% (3 toe).

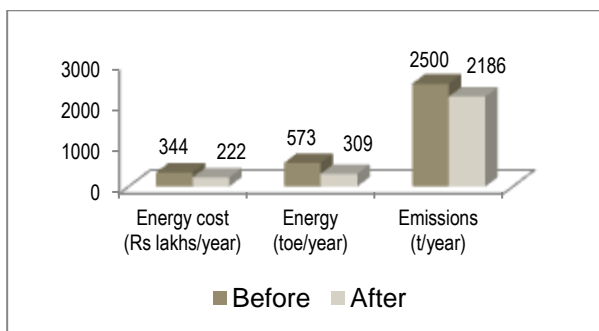
Process description

The manufacturing process involves the cutting of steel rods in the form of billets. The billets are heated in furnaces, forged with hammers and presses, subjected to heat treatment, and deburred to give the final products.

The main energy consuming equipments used were three FO-based forging furnaces; two heat treatment furnaces (one based on FO and the other on LDO); and electrical motors associated with utilities like air compressor and pumps.



Overall Impact: post- implementation



Overall Impact
 35% reduction in total energy bill (i.e. annual savings of INR 122 lakhs) with a simple payback of 1.2 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

Replacement of two existing FO-fired forging furnaces with induction billet heaters

Baseline Scenario

The unit was operating two FO-fired forging furnaces of capacity 400 kg/hour and 150 kg/hour. The efficiencies of these furnaces were low, at 7% and 6% respectively.



Recommendation

The unit was advised to replace these two FO-fired forging furnaces with induction billet heaters of rating 250 kW (625 kg per hour capacity) and 120 kW (300 kg per hour capacity) respectively.

Implemented

As recommended, the unit replaced two FO-fired forging furnaces (400 kg/hour and 150 kg/hour) with induction billet heaters of rating 250 kW (625 kg per hour capacity) and 120 kW (300 kg per hour capacity) respectively. The new systems consume 714,778 kWh of electricity annually, but save 329,292 litres of FO.



This overall investment of INR 145.3 lakhs (including auxiliaries costing INR 75.2 lakhs) is saving INR 121.6 lakhs annually. 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.

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

