

MSME forging unit invests Rs 16 lakhs for improving energy efficiency – and saves Rs 26 lakhs every year!

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 P3 is an MSME unit that manufactures forged auto components like axle, gear blanks, flanges and elbows, producing about 3600 tpa. The annual energy bill of the unit was INR 128 lakhs, which was around 68% of total turnover. The annual energy consumption was around 224 tonnes of oil equivalent (toe), of which furnace oil (FO) accounted for 91% (203 toe) and grid electricity 9% (21 toe).

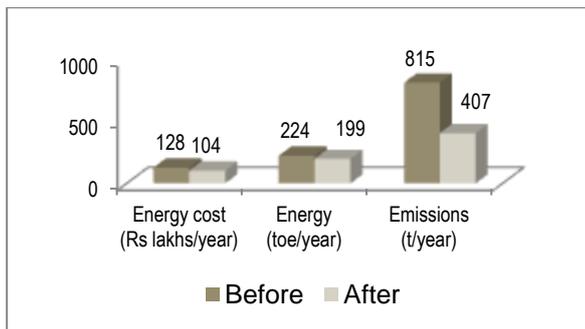
Process description

Steel rods are cut into billets, which are heated in an FO-fired furnace and forged with hammers and presses. The components are then subjected to various heat treatment processes like normalizing, hardening and annealing, and undergo shot blasting to give the final products.

The major energy consuming equipments used were three FO-fired forging furnaces, and electrical motors associated with process equipment such as air compressor, pumps, etc.



Overall Impact: post-implementation



Overall Impact

18% reduction in total energy bill (i.e. annual savings of INR 26 lakhs) with a simple payback of 0.6 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 forging furnaces

Baseline Scenario

The unit was operating three FO-fired box type forging furnaces: one of capacity 200 kg per hour, and two of capacity 250 kg per hour. These furnaces had efficiencies below 10%.



Recommendation

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

Implemented Scenario

As recommended, the unit switched from using FO to NG as fuel for its three forging furnaces. The furnaces now consume about 208,800 SCM of NG annually, but save about 206,000 litres of FO.



This investment of INR 15.1 lakhs saves INR 23.6 lakhs annually. The simple payback period is 0.6 years.

Relining of one forging furnace to reduce surface heat loss

The forging furnace of capacity 200 kg/hour (associated with one-tonne hammer) showed high surface heat loss (about 13,100 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 0.9 lakhs is saving about 5600 SCM of NG annually, equivalent to INR 2.2 lakhs. The simple payback period is 0.4 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.

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