

MSME forging unit invests Rs 1 lakh for improving energy efficiency – and saves Rs 6 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).

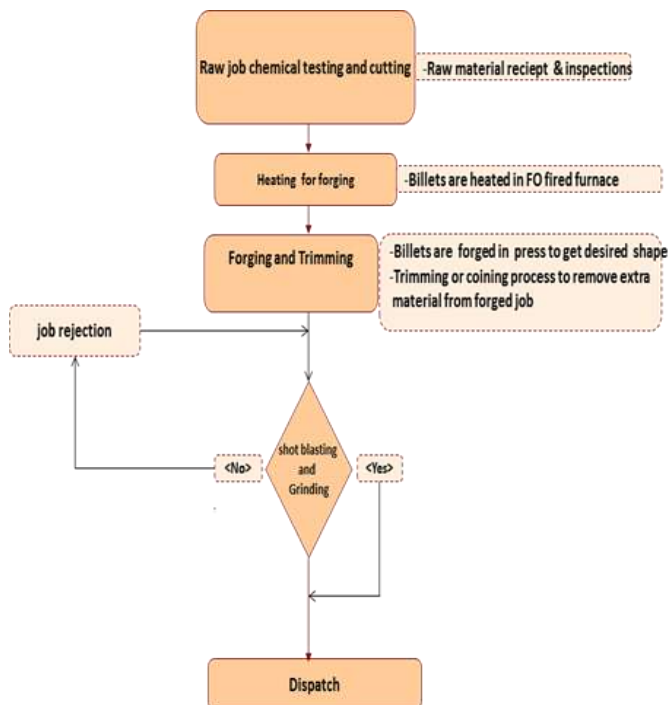
Unit profile

M/s P14 is an MSME unit that manufactures forged auto components like axle, gear blanks, flanges and elbows, producing about 936 tpa. The annual energy bill of the unit was INR 89 lakhs, which was around 32% of total turnover. The annual energy consumption was around 155 tonnes of oil equivalent (toe), of which furnace oil (FO) accounted for 89% (137 toe) and grid electricity 11% (18 toe).

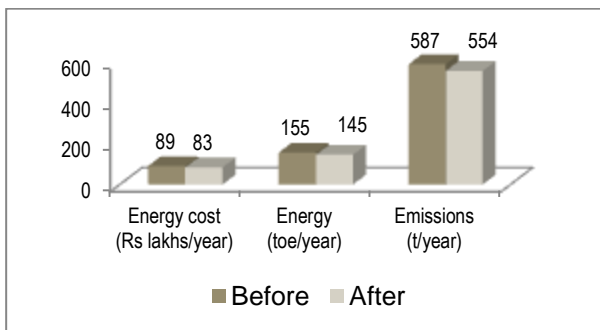
Process description

Steel bars are cut into billets, which are heated in an FO-fired furnace and forged with hammers and presses. The components are then sent for 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 two FO-fired forging furnaces, and electrical motors associated with process equipment such as air compressor, pumps, etc.



Overall Impact: post-implementation



Overall Impact
 7% reduction in total energy bill (i.e. annual savings of INR 6 lakhs) with a simple payback of 0.2 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

Relining and application of veneering modules to the two forging furnaces

Baseline Scenario

The unit was operating two FO-fired forging furnaces, of capacities 250 kg per hour (for 1.5 tonne hammer) and 200 kg per hour (for 0.75 tonne hammer). These furnaces had very low efficiencies, of 10% and 9% respectively, due to high surface heat losses.



Recommendation

The unit was advised to reline and apply veneering modules to the insides of both furnaces to minimize surface heat losses.

Implemented

As recommended, the unit relined and apply veneering modules to the insides of both furnaces. This measure has minimized surface heat losses and reduced cold start-up time.



This investment of $(0.6 + 0.5) = 1.1$ lakhs is saving $(7720 + 3586) = 11,306$ litres of FO on the two furnaces annually, equivalent to INR 6 lakhs. The simple payback period is less than three months (0.2 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.

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