

MSME forging unit invests Rs 14 lakhs in energy efficiency measures – and saves Rs 20 lakhs every year!

Background

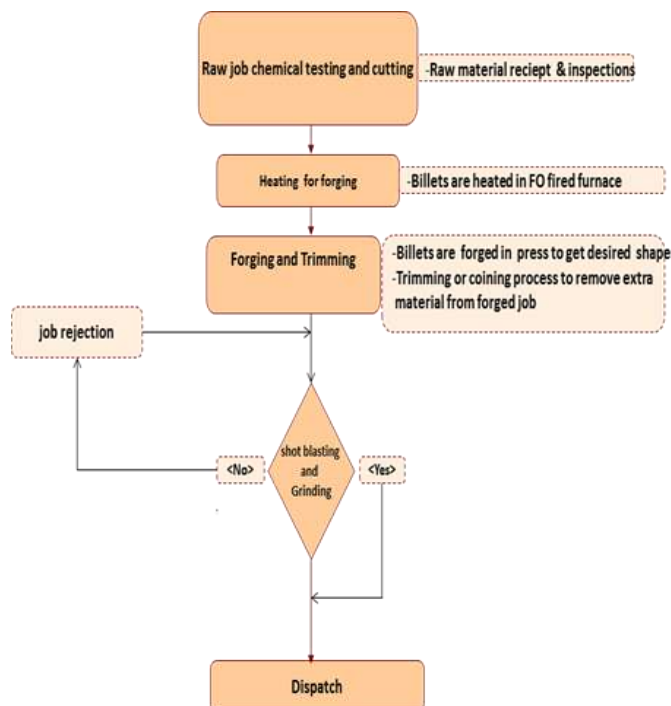
Pune, in Maharashtra, is a forging industry cluster. Large-scale units account for about 65–70% of the cluster’s forging production, while MSMEs account for the remaining 30–35%. There are over 50 MSMEs producing forged components, with 20 heat treatment MSMEs functioning as their vendors. The production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

Unit profile

M/s P13 is an MSME unit that manufactures forged auto components like axles, gear blanks, connecting rods, flanges and valves, producing about 1248 tpa. The annual energy bill of the unit was INR 108 lakhs, which was around 10% of total turnover. The annual energy consumption was around 144 tonnes of oil equivalent (toe), of which furnace oil (FO) accounted for 51% (74 toe), grid electricity 48% (68 toe) and high speed diesel (HSD) 1% (1 toe).

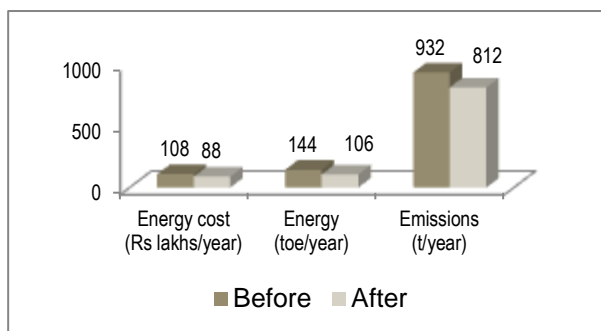
Process description

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, and undergo trimming and shot blasting to give the final products.



The major energy consuming equipments used were two FO-fired forging furnaces, an FO-fired heat treatment furnace, an electrical induction furnace for billet heating, and electrical motors associated with process equipment such as air compressor, pumps, etc.

Overall Impact: post- implementation



Overall Impact
 19% reduction in total energy bill (i.e. annual savings of INR 20 lakhs) with a simple payback of 9 months

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 existing 250 kg/hour FO-fired forging furnace with energy efficient furnace

Baseline Scenario

The unit was operating an FO-fired forging furnace of capacity 250 kg per hour, associated with 1 tonne hammer. The efficiency of this furnace was only about 7%.



Recommendation

The unit was advised to replace this furnace with an energy efficient furnace of same capacity.

Implemented Scenario

As advised, the unit replaced the 250 kg/hour forging furnace with an energy efficient furnace. The new furnace has better automated control systems to reduce heat losses.



This investment of INR 3.4 lakhs is saving about 21,250 litres of FO annually, equivalent to INR 11.1 lakhs. The simple payback period is just four months.

Replacement of existing 400 kg/hour FO-fired forging furnace with energy efficient furnace

The existing 400 kh/hour FO-fired forging furnace had an efficiency of only about 7%. As advised, the unit replaced it with an energy efficient furnace with automatic controls to reduce heat losses. This investment of INR 3.8 lakhs is saving 8500 litres of FO annually, equivalent to INR 4.4 lakhs. The simple payback period is 0.9 year.

Installation of new LPG-fired furnace for annealing process

The unit was using the FO-fired normalizing furnace for annealing too. As advised, the unit installed a new LPG-fired annealing furnace which anneals components directly after trimming, at high temperature, thus saving energy. This investment of INR 3.5 lakhs is effectively saving INR 4 lakhs annually. The simple payback period is 0.9 year.

Replacement of all old reciprocating air compressors with new energy efficient screw air compressor

As advised, the unit replaced its two 10 HP reciprocating air compressor with new energy efficient screw air compressors of rating 15 HP each. This investment of INR 3.6 lakhs is saving INR 0.9 lakhs annually in electricity charges, with a simple payback period of 3.9 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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