MSME forging unit invests less than Rs 2 lakhs on energy efficiency measures—and saves Rs 12 lakhs every year!

Background

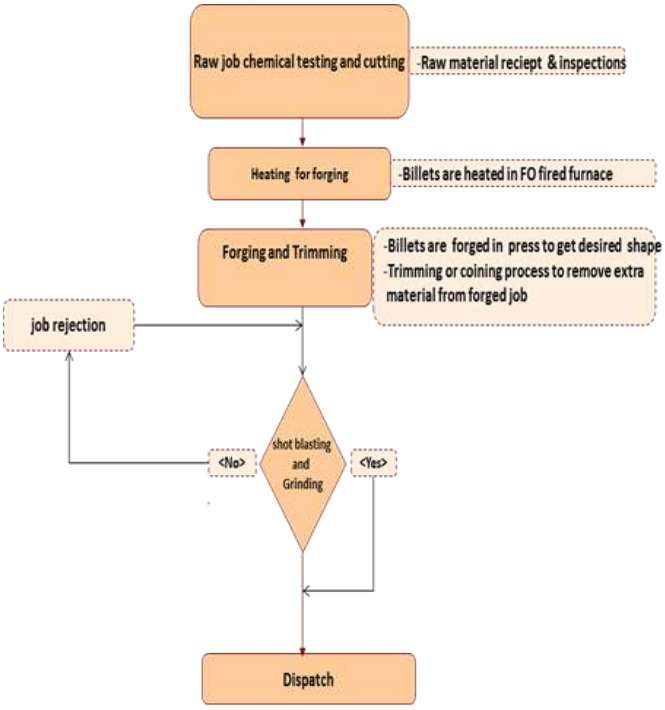
Pune, in Maharashtra, is a forging industry cluster. Large-scale units account for about 65–70% of the cluster's forging production, while MSMEs account for the remaining 30–35%. There are over 50 MSMEs producing forged components, with 20 heat treatment MSMEs functioning as their vendors. The production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

Unit profile

M/s **P18** is an MSME unit that manufactures forged auto components like shafts, crankshafts, gears, hubs and flanges, producing about 1640 tpa. The annual energy bill of the unit was INR 119 lakhs, which was around 13% of total turnover. The annual energy consumption was around 279 tonnes of oil equivalent (toe), of which natural gas (NG) accounted for 72% (202 toe), grid electricity 21% (58 toe) and light diesel oil (LDO) 7% (19 toe).

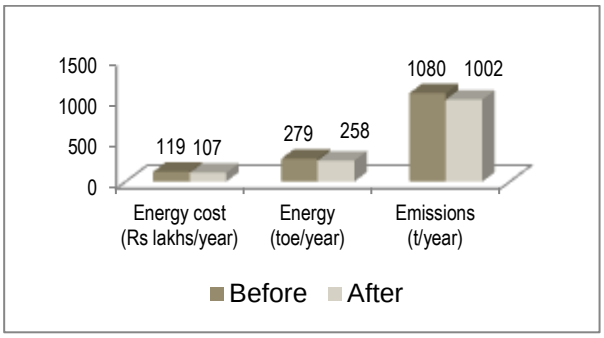
Process description

Steel rods are cut into billets, which are heated in an NG-fired furnace and forged with hammers and presses. The components are then subjected to heat treatment processes in an LDO-fired furnace, and shot-blasted to give the final products.



The major energy consuming equipments used were four NG-fired forging furnaces, one LDO-fired heat treatment furnace, and electrical motors associated with process equipment such as air compressor, pumps, etc.

Overall Impact: post- implementation



Overall Impact

10% reduction in total energy bill (i.e. annual savings of INR 12 lakhs) with a simple payback of less than two 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 CO_2. This project is being co-implemented by Small Industries Development Bank of India (SIDBI) and Bureau of Energy Efficiency

INTERVENTIONS

Application of veneering to one forging furnace

Baseline Scenario

One of the NG-fired forging furnaces (of capacity 400 kg per hour) had efficiency below 11% due to poor insulation.

Recommendation
The unit was advised to apply veneering modules on the inside of the arch of the furnace to minimize heat losses.

Implemented Scenario

As advised, the unit applied veneering modules on the inside of the arch of the 400 kg/hour forging furnace.

This investment of INR is saving 4031 SCM of NG annually, equivalent to INR 1.7 lakhs. The simple payback period is 0.2 year.

Installation of doors on three furnaces to avoid radiation losses

Three of the NG-fired forging furnaces (associated with hammers of 1 tonne, 1.25 tonne and 3 tonnes) did not have doors on their loading sides. This was resulting in high radiation losses. As advised, the unit installed a door on each of these three furnaces. This measure required a total investment of INR 0.3 lakhs, and is saving an estimated 16,542 SCM of NG annually, equivalent to INR 7 lakhs. The simple payback period is just 15 days.

Replacement of existing blowers in three forging furnaces with new blowers

Three of the NG-fired forging furnaces (associated with hammers of 1 tonne, 1.25 tonnes and 3 tonnes) had low efficiencies (10–11%) because the blowers used in these furnaces were of higher ratings than required. As advised, the unit replaced the existing blowers with new blowers of appropriate capacities. This investment of INR 0.9 lakh is saving a total of around 47,300 kWh of electricity annually, equivalent to INR 3.2 lakhs. The simple payback period is four months.

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

For further information please contact:
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