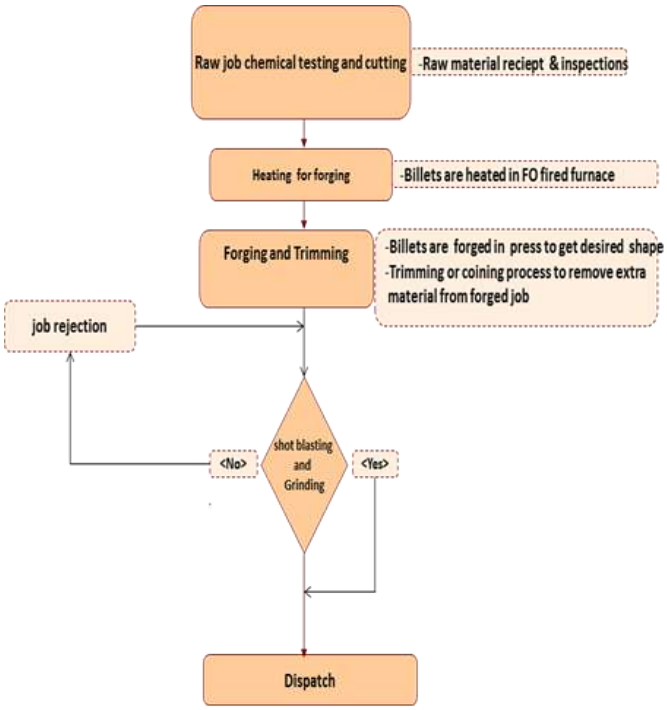
MSME forging unit invests Rs 7 lakhs in energy efficiency measures—and saves Rs 15 lakhs annually!

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 **P16** is an MSME unit that manufactures forged auto components like shafts, crankshafts, gears and flanges, producing about 871 tpa. The annual energy bill of the unit was INR 124 lakhs, which was around 4% of total turnover. The annual energy consumption was around 229 tonnes of oil equivalent (toe), of which natural gas (NG) accounted for 92% (210 toe) and grid electricity 8% (19 toe).

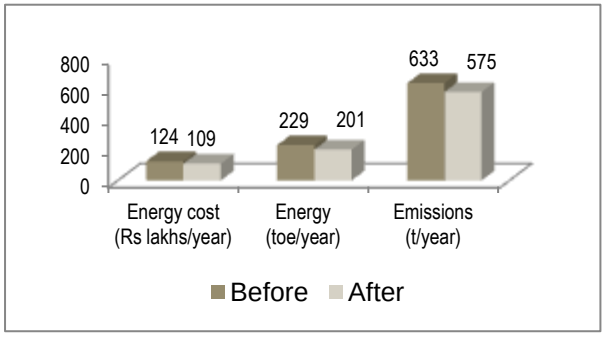


Process description

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 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 NG-fired forging and heat treatment furnaces, one electrical induction furnace, a powder-coating oven, and electrical motors associated with process equipment such as air compressor, pumps, etc.

Overall Impact: post- implementation



Overall Impact

12% reduction in total energy bill (i.e. annual savings of INR 15 lakhs) with a simple payback of 6 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 module to heat treatment furnace

Baseline Scenario

The unit was operating an NG- fired hardening furnace of capacity 200 kg per hour, which had low efficiency due to poor insulation.

Recommendation
The unit was advised to apply veneering modules on the inside surfaces of this furnace to minimize heat loss and reduce cold start-up time.

Implemented Scenario

As advised, the unit applied veneering modules on the inside surfaces of the 200 kg/hour heat treatment furnace.

This investment of INR 1.1 lakhs is saving 12,204 SCM of NG per year, equivalent to INR 5.17 lakhs. The simple payback period is less than 3 months.

Application of ceramic blanket to heat treatment furnace

The unit was operating an NG- fired tempering furnace of capacity 700 kg per hour, which showed high levels of surface heat losses. As advised, the unit applied ceramic blanket inside the furnace to minimize surface heat losses and reduce cold start-up time. This investment of INR 0.7 lakh is saving 11,898 SCM of NG per year, equivalent to INR 5.04 lakhs. The simple payback period is less than 2 months.

Providing insulation for powder-coating oven

The unit was operating an NG-fired powder coating oven which was poorly insulated. As advised, the unit applied ceramic fibre insulation to the inside of the oven to reduce the surface heat loss. This measure has also improved the working atmosphere, and saves residual heat during non-firing time. This investment of INR 0.9 lakh is saving 8918 SCM of NG annually, equivalent to INR 3.7 lakhs. The simple payback period is less than 3 months.

Improvement of power factor

The average power factor was 0.96. As advised, the unit installed capacitors at the main panel to maintain power factor at unity. This investment of INR 4.1 lakhs is saving INR 1 lakh annually, with a simple payback period of 4.4 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

For further information please contact:
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