

MSME forging unit invests Rs 6 lakhs in energy efficiency improvements – and saves Rs 8 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).

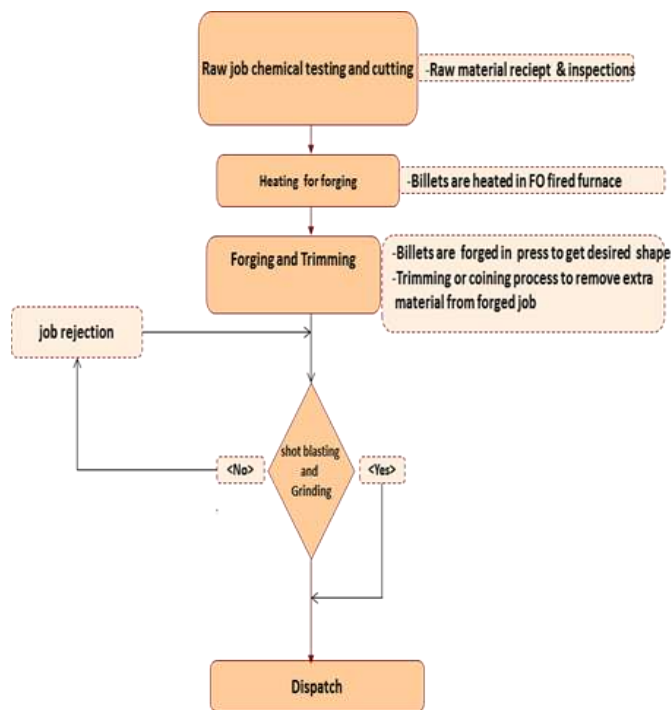
Unit profile

M/s P24 is an MSME unit that manufactures bars/squares, discs, rings, and shafts through open die forging process for the power and automobile industries, producing about 755 tonnes annually. The total annual energy bill of the unit was INR 97 lakhs, which was around 58% of turnover. The annual energy consumption was about 596 tonnes of oil equivalent (toe), of which furnace oil (FO) accounted for 90% (317 toe) and grid electricity 10% (110 toe).

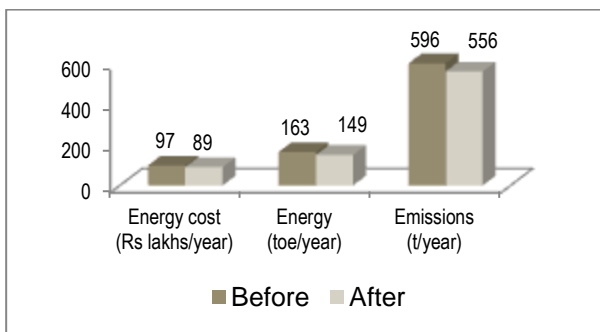
Process description

The manufacturing process involves the cutting of steel rods in the form of billets. The billets are heated in furnaces, forged with hammers and presses, subjected to heat treatment, and shot-blasted and ground to give the final products.

The main energy consuming equipments used were an FO-based forging furnace, an FO-based heat treatment furnace, and electrical motors associated with utilities like air compressor and pumps.



Overall Impact: post- implementation



Overall Impact
 8% reduction in total energy bill (i.e. annual savings of INR 8 lakhs) with a simple payback of 0.7 year

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 of forging furnace to reduce heat losses

Baseline Scenario

The unit was operating an FO-fired forging furnace of capacity 10 tonnes per batch (associated with 1000 tonne press). Poor insulation was resulting in high surface heat losses (estimated at 76,449 kCal per hour).



Recommendation

The unit was advised to reline the furnace with veneer insulation to minimize surface heat losses.

Implemented Scenario

As advised, the unit relined the forging furnace with veneer insulation. This measure has not only reduced surface heat losses but also improved the working atmosphere near the furnace.



This investment of INR 1.2 lakhs is saving 13,722 litres of FO annually, equivalent to INR 7.1 lakhs. The simple payback period is 3 months.

Improvement of power factor to unity by installation of APFC panel

The average power factor was observed to be 0.97. As advised, the unit installed new capacitors at the APFC panel to maintain the PF at unity. This investment of INR 4.6 lakhs is saving electricity worth INR 1 lakh annually. The simple payback period is 4.6 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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