MSME forging unit invests Rs 16 lakhs in energy efficiency measures—and saves Rs 20 lakhs on annual energy bill!

Background

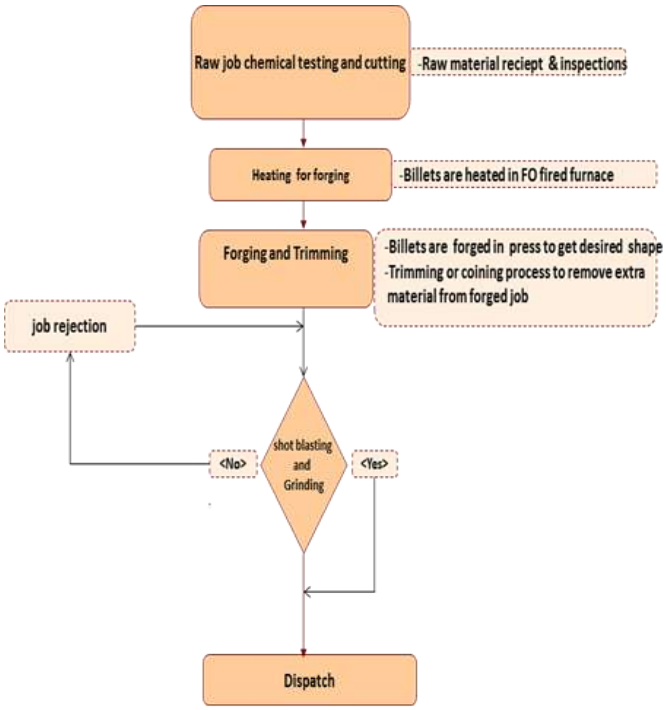
Pune, in Maharashtra, is a forging industry cluster. Large-scale units account for about 65–70% of the cluster's forging production, while MSMEs account for the remaining 30–35%. There are over 50 MSMEs producing forged components, with 20 heat treatment MSMEs functioning as their vendors. The production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

Unit profile

M/s **P15** is an MSME unit that manufactures forged auto components like axle, gear blanks, flanges and elbows, producing about 2577 tpa. The annual energy bill of the unit was INR 230 lakhs. The annual energy consumption was around 550 tonnes of oil equivalent (toe), of which natural gas (NG) accounted for 80% (440 toe) and grid electricity 20% (110 toe).

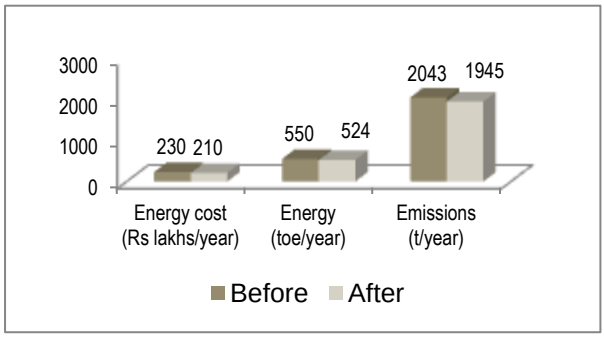
Process description

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 four NG-fired forging furnaces, one 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

9% reduction in total energy bill (i.e. annual savings of INR 20 lakhs) with a simple payback of 0.8 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 CO_2. This project is being co-implemented by Small Industries Development Bank of India (SIDBI) and Bureau of Energy Efficiency

INTERVENTIONS

Application of ceramic fibre insulation to one forging furnace

Baseline Scenario

One of the NG fired forging furnaces (capacity 200 kg/hour, associated with 300-tonne press) had a very low efficiency due to poor insulation.

Recommendation

The unit was advised to reline this furnace with ceramic fibre to minimize the surface heat loss.

Implemented Scenario

As advised, the unit relined the 200 kg/hour forging furnace with ceramic fibre.

This investment of INR 1.9 lakhs is saving 11,633 SCM of NG annually, equivalent to INR 4.9 lakhs. The simple payback period is 0.4 year.

Veneering module for hardening furnace

The 300kg/hour NG -fired heat treatment (hardening) furnace had efficiency below 13%. As advised, the unit applied veneering module inside the furnace to reduce surface heat loss and cold start-up time. This investment of INR 1 lakh is saving 12,581 SCM of NG annually, equivalent to INR 5.3 lakhs. The simple payback period is barely 3 months.

Optimization of compressed air pressure in three air compressors

As advised, the unit reset the air pressures on three air compressors to match process needs. At no cost, this measure saves electricity worth INR 2.2 lakhs annually.

Improvement of power factor

The average power factor was 0.97. As advised, the unit increased it to unity by installing additional capacitors totalling 150 kVAR in the existing APFC panel. This investment of 0.3 lakh is saving INR 5 lakhs annually. The simple payback period is 1 month.

Replacement of three old air compressors with new energy efficient screw air compressor

As advised, the unit replaced three old air compressors (15 kW, 7.5 kW and 7.5 kW) with a single energy efficient 45 kW screw air compressor. This investment of INR 11.5 lakhs is saving INR 2.1 lakhs annually in electricity charges. The simple payback period is 5.5 years.

Energy efficient lighting

As advised, the unit replaced its existing 12 halogen lamps with six 250 W induction lamps, and 20 FTLs with T-5 lights (30 W). This investment of INR 1.8 lakhs is saving 0.6 lakh annually. The simple payback period is 3.3 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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