MSME forging unit reduces energy bill by 26% through energy efficiency measures

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).

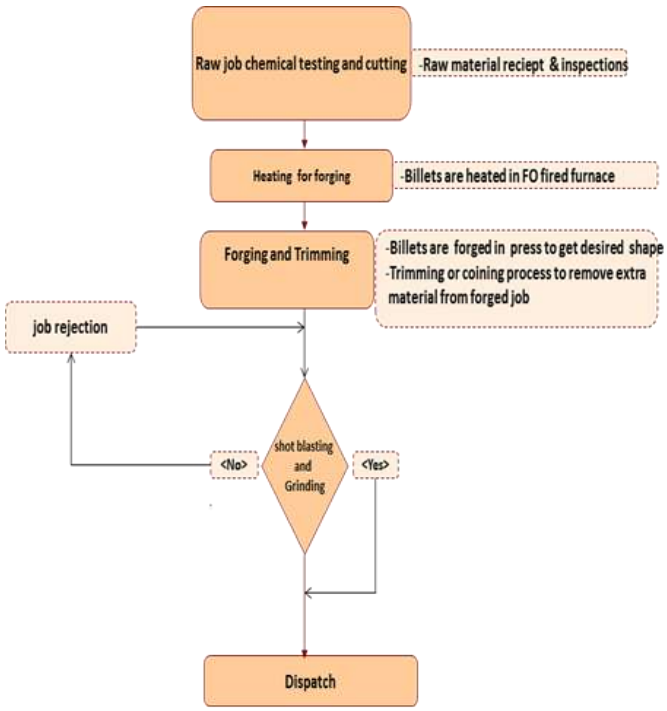
Unit profile

M/s **P11** is an MSME unit that manufactures forged auto components like gears, shafts and so on, producing about 1160 tpa. The annual energy bill of the unit was INR 119 lakhs, which was around 23% of total turnover. The annual energy consumption was around 259 tonnes of oil equivalent (toe), of which natural gas (NG) accounted for 90% (234 toe) and grid electricity 10% (25 toe).

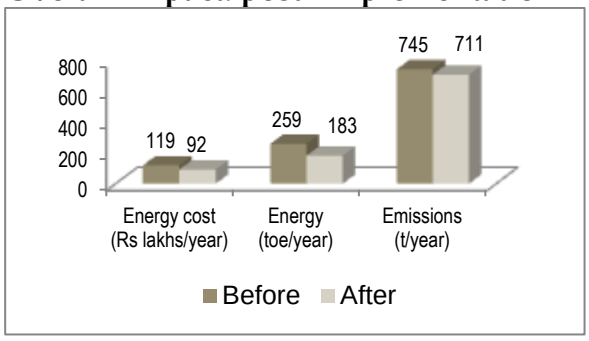
Process description

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, shot blasting and grinding to give the final products.

The major energy consuming equipments used were three NG-fired forging furnaces, and electrical motors associated with process equipment such as air compressor, pumps, etc.



Overall Impact: post- implementation



Overall Impact

26% reduction in total energy bill (i.e. annual savings of INR 31 lakhs) with a simple payback of 2.1 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

Replacement of existing NG-fired forging furnace with induction billet heater

Baseline Scenario

The unit was operating an NG-fired forging furnace of capacity 200 kg/hour, associated with 800 tonne forging press. The efficiency of this furnace was barely 7%.

Recommendation

The unit was advised to replace the NG-fired forging furnace with an. energy efficient induction billet heater of rating 175 kW (450 kg per hour capacity).

Implemented

Based on the project's recommendation, the unit replaced the NG-fired forging furnace with an. energy efficient induction billet heater of rating 175 kW (450 kg per hour capacity). The new system uses 173,086 kWh of electricity annually, but saves 106,623 SCM of NG.

This investment of INR 64.1 lakhs is saving INR 26 lakhs annually. The simple payback period is 2.5 years.

Change of blower for forging furnace

The unit was operating an NG-fired forging furnace of capacity 250 kg per hour, which had an efficiency of only 7%. As advised, the unit replaced the existing blower with a new blower in order to optimize combustion air supply. This investment of INR 0.4 lakhs is saving 11,668 SCM of NG annually, equivalent to INR 4.90 lakhs. The simple payback period is just 2 months.

Replacement of old hammer motor with high efficiency motor

The unit was using a 1-tonne hammer which had a low-efficiency Eff3 class motor. As advised, the unit replaced this old motor with a new energy efficient Eff1 class motor. This investment of INR 1.3 lakhs is saving 5848 kWh of electricity annually, equivalent to INR 0.5 lakh. The simple payback period is 2.4 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:

Energy Efficiency Centre, Small Industries Development Bank of India (SIDBI), Ground Floor, E-1, Videocon Tower, Jhandewalan Extension, Rani Jhansi Road, New Delhi-110055, India, Ph. 011 23682473-77, www.sidbi.in

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