

MSME casting unit invests in energy efficiency measures – and recovers investment in 9 months!

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).

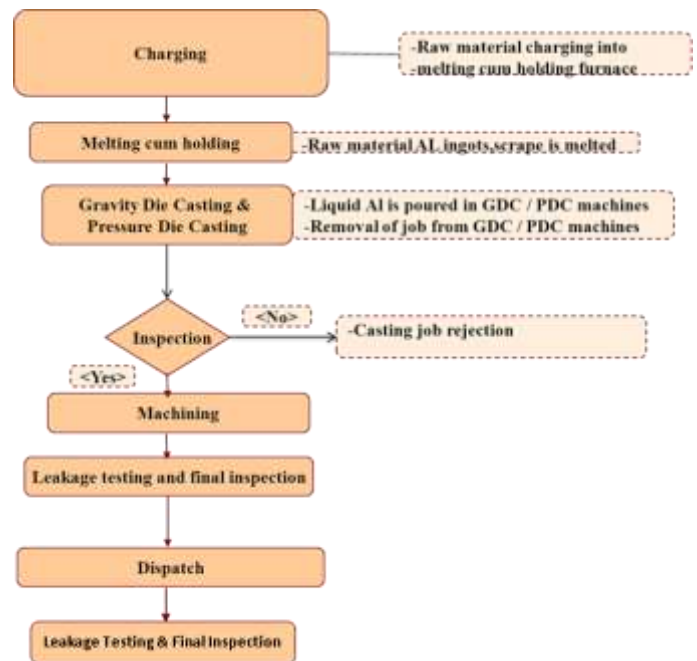
Unit profile

M/s P17 is an MSME unit that manufactures aluminium castings for auto components like casings, exhaust pipes, levers etc., producing about 549 tpa. The annual energy bill of the unit was INR 147 lakhs, which was around 15% of total turnover. The annual energy consumption was around 166 tonnes of oil equivalent (toe), of which grid electricity accounted for 83% (139 toe) and furnace oil (FO) 17% (27 toe).

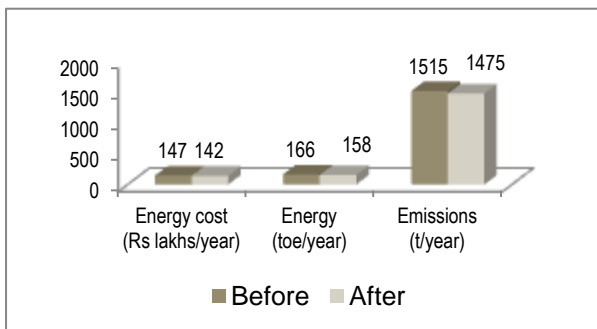
Process description

Aluminium bars and/or ingots are charged in an FO-fired melting furnace, from which the liquid aluminium is transferred into an electrical melting-cum-holding furnace. The melt is then moulded into the required shapes in pressure die casting machines, and machined to give the final products.

The major energy consuming equipments used were an FO-fired melting furnace, electrical melting-cum-holding furnaces, and electrical motors associated with process equipment such as air compressor, pumps, etc.



Overall Impact: post- implementation



Overall Impact
3% reduction in total energy bill (i.e. annual savings of INR 5 lakhs) with a simple payback of 0.7 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 CO₂. This project is being co-implemented by Small Industries Development Bank of India (SIDBI) and Bureau of Energy Efficiency

INTERVENTIONS

Relining of FO-fired melting furnace

Baseline Scenario

The unit was operating an FO-fired melting furnace which showed high surface heat losses.



Recommendation

The unit was advised to reline the furnace to minimize surface heat loss.

Implemented Scenario

As advised, the unit relined the FO-fired melting furnace.



This investment of INR 0.3 lakh annually, equivalent to INR 0.3 lakh, and has also improved the working atmosphere near the furnace. The simple payback period is 2.5 years.

Replacement of two old burners in melting furnace with new burner

The FO-fired melting furnace had two old burners with high firing rate, leading to higher fuel consumption. As advised, the unit replaced these burners with a single efficient burner. This investment of INR 1.8 lakhs is saving 4596 litres of FO annually, equivalent to INR 2.4 lakhs. The simple payback period is 0.8 years.

Application of insulation over holding furnace

The unit was operating two electrical crucible type holding furnaces of capacity 500 kg/batch and rating 36 kW. Radiation losses were occurring through the furnace opening. As advised, the unit applied insulation (lid) over the opening of the holding furnaces. This investment of INR 0.1 lakh is saving 23,298 kWh of electricity annually, equivalent to INR 1.9 lakhs. The simple payback period is one month.

Energy efficient lighting

As advised, the unit replaced its existing 250-W mercury vapour lamps with energy efficient LED lamps of 100 W. This investment of INR 0.9 lakhs is saving 5372 kWh of electricity annually, equivalent to INR 0.4 lakh. The simple payback period is 2 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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