MSME casting unit invests less than Rs 3 lakhs in energy efficiency measures—and saves Rs 6 lakhs annually!

Background

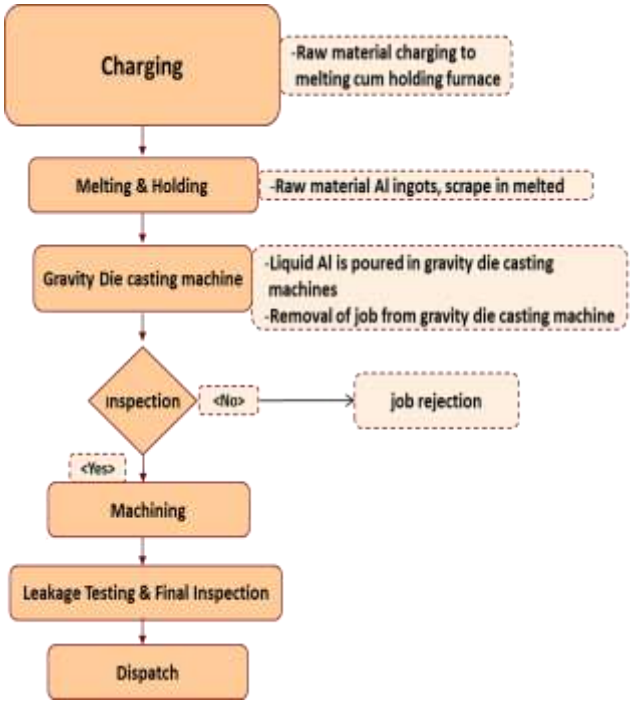
Pune, in Maharashtra, is a forging industry cluster. Large-scale units account for about 65–70% of the cluster's forging production, while MSMEs account for the remaining 30–35%. There are over 50 MSMEs producing forged components, with 20 heat treatment MSMEs functioning as their vendors. The production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

Unit profile

M/s **P20** is an MSME unit that manufactures aluminium castings for automobile parts like intercooler, valve body, ventilator fan, etc., producing about 753 tpa. The annual energy bill of the unit was INR 112 lakhs, which was around 5% of total turnover. The annual energy consumption was around 173 tonnes of oil equivalent (toe), of which furnace oil (FO) accounted for 62% (108 toe), grid electricity 32% (19 toe), and LPG 6% (10 toe).

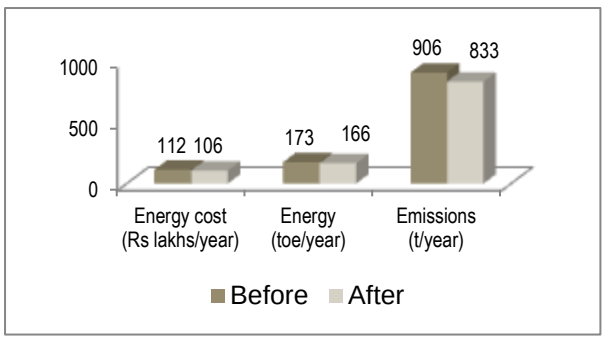
Process description

Aluminium ingots and scrap are charged into an FO-fired melting furnace, from which the molten aluminium is drawn into an electrical melting-cum-holding furnace, and then poured into a gravity die casting machine to make the castings. The castings are then machined as per specifications to give the final products.



The major energy consuming equipments used were an FO-fired melting furnace, three electrical melting-cum-holding furnaces, an electrical heating oven, LPG-based gravity die casting machine, and electrical motors associated with process equipment such as air compressor, pumps, etc.

Overall Impact: post- implementation



Overall Impact

5% reduction in total energy bill (i.e. annual savings of INR 6 lakhs) with a simple payback of 0.4 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

Relining of two electrical melting-cum-holding furnaces

Baseline Scenario

Two of the unit's three electrical holding furnaces (with batch capacities of 500 kg and 300 kg) had damaged refractory linings, resulting in high surface heat losses.

Recommendation

The unit was advised to reline these two furnaces to minimize surface heat losses.

Implemented Scenario

As advised, the unit relined two electrical holding furnaces. This measure reduced heat losses and also improved the working atmosphere near the furnace.

This investment of INR 2 lakhs is saving 45,000 kWh of electricity annually, equivalent to INR 3.4 lakhs. The simple payback period is 0.6 year.

Use of air guns instead of air pipe to reduce air consumption

The unit's 25 HP screw air compressor was using air gun pipes of 6 mm diameter for scale blowing of compressed air. As advised, the unit replaced the air guns with 4 mm diameter pipes at a cost of just INR 0.01 lakh. The energy savings are 9,841 kWh per year, equivalent to INR 0.7 lakh. The simple payback period is two months.

Energy efficient lighting

As advised, the unit replaced its existing T-12 and T-8 TFLs with energy efficient T-5 TFLs, and MVLs and halogen lamps with LED lamps. This investment of INR 0.6 lakh is saving 7838 kWh annually, equivalent to INR 0.6 lakh. The simple payback period is one year.

Providing insulation lids for two holding furnaces

Two of the electrical melting-cum-holding furnaces (500 kg and 300 kg) were open at their tops, resulting in high radiation losses. As advised, the unit provided insulation (lids) for the openings of these two furnaces at an investment of INR 0.1 lakh. The yearly electricity saving is 18,828 kWh, equivalent to INR 1.4 lakhs. The simple payback period is just one month.

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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