MSME foundry unit invests Rs 17 lakhs on energy efficiency measures—and saves Rs 22 lakhs annually!

Background

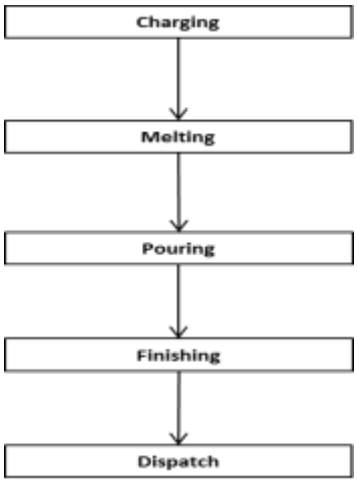
Kolhapur, in Maharashtra, is a foundry cluster. It has around 300 MSME foundries producing about 600,000 tonnes of castings annually, accounting for about 7–8% of India's total castings production. The production capacity of these units varies from less than 1000 tonnes to over 10,000 tonnes per annum (tpa).

Unit profile

M/s **K4** is an MSME unit manufacturing aluminium castings. The annual production is about 1010 tonnes. The total annual energy bill of the unit was about INR 102 lakhs. The total annual energy consumption was about 121 tonnes of oil equivalent (toe), in the form of grid electricity.

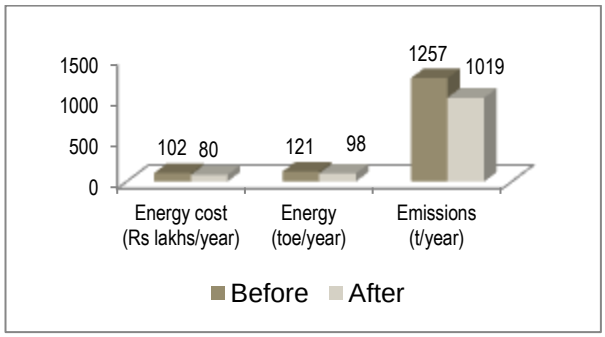
Process description

First, aluminium ingots are melted in an electrical resistance melting furnace. The molten metal is then drawn into an electrical induction furnace where it is mixed and melted with alloying elements and some raw aluminium. The melt is poured into moulds; after cooling, the moulds are 'knocked out' to yield the castings, which then undergo fettling and machining to give the finished products.



The main energy consuming equipments used were an electrical resistance furnace, an electrical induction furnace, and electrical motors associated with process equipment such as agitators, pumps, etc.

Overall Impact: post- implementation



Overall Impact

21% reduction in total energy bill (i.e. annual savings of INR 22 lakhs) with a simple payback of 0.8 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 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 resistance melting furnace by new resistance furnace

Baseline Scenario

The unit's resistance melting furnace was found to consume less power for melting aluminium than the induction furnace. Despite this, the unit was melting some of the aluminium in the induction furnace, because the resistance furnace was small in size.

Recommendation

The unit was advised to replace its existing resistance furnace with one of larger capacity.

Implemented Scenario

As advised, the unit replaced its resistance furnace with a resistance furnace of higher capacity (500 kg).

This investment of INR 6.7 lakhs is saving 2,38,360 kWh annually, equivalent to INR 19.2 lakhs. The simple payback period is 0.4 year.

Automation in pouring system of molten metal

Molten metal was being poured manually from the resistance furnace into the induction furnace, and from the latter into the moulds. This practice led to temperature drops, due to which the molten metal was being heated to higher temperatures than required. As advised, the unit installed an automatic pouring system that has brought down pouring time and hence temperature drop. This investment of INR 9.6 lakhs is saving 23,389 kWh per year, equivalent to INR 1.9 lakhs. The simple payback period is 5.1 years.

Energy efficient lighting

As advised, the unit replaced its existing 40W fluorescent tube lights (FTLs) having conventional copper ballasts with 28W FTLs having electronic ballasts and its existing mercury vapour lamps with metal halide lamps. This investment of INR 0.6 lakh is saving about 5592 kWh annually, equivalent to INR 0.4 lakh. The simple payback period is 1.3 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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