MSME foundry unit invests Rs 3 lakhs on energy efficiency measures—and saves over Rs 17 lakhs annually!

Background

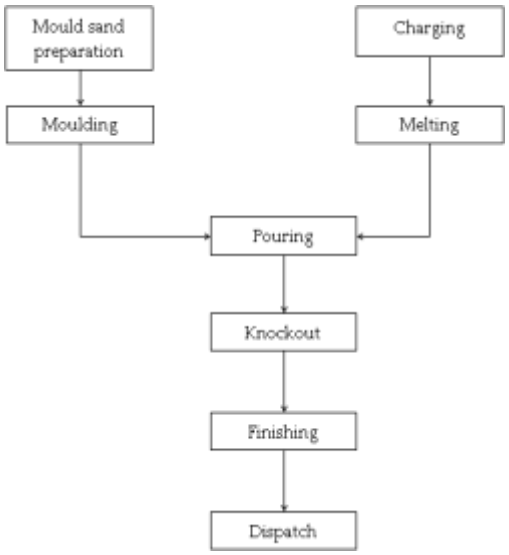
Kolhapur, in Maharashtra, is a foundry cluster. It has around 300 MSME foundries producing about 600,000 tonnes of castings annually, accounting for about 7–8% of India's total castings production. The production capacity of these units varies from less than 1000 tonnes to over 10,000 tonnes per annum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

Unit profile

M/s **K17** is an MSME unit manufacturing graded cast iron (CI) and spheroidal graphite iron (SGI) castings. The annual production is about 1560 tonnes. The total annual energy bill of the unit was about INR 167 lakhs. The total annual energy consumption was about 207 tonnes of oil equivalent (toe), in the form of grid electricity.

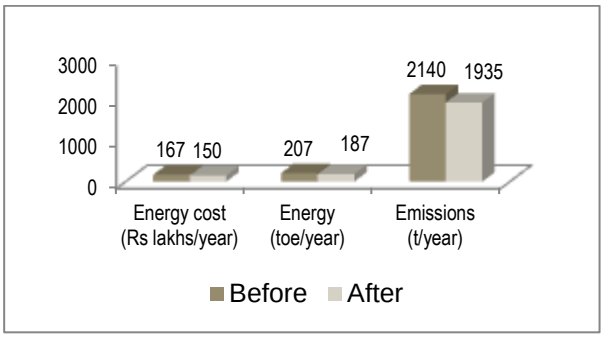
Process description

The major process steps are mould preparation, melting, pouring, knockout and finishing. Green sand is prepared using sand mixer and manually moulded. The charge is melted in an electrical induction furnace. The liquid metal is poured into moulds, which are left to cool and then 'knocked out' manually to yield the castings. The sand is reused, and the castings are subjected to shot blasting and machining to give the finished products.



The major energy consuming equipments used were an electrical induction furnace and electrical motors associated with process equipment such as reaction vessels, pumps, etc.

Overall Impact: post- implementation



Overall Impact

11% reduction in total energy bill (i.e. annual savings of INR 20 lakhs) with a simple payback of 0.2 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

1. Lid mechanism for induction furnace

Baseline Scenario

The unit's induction furnace had a 400 mm diameter circular opening. In the absence of a lid, radiation losses were high (14.6 kWh per batch).

Recommendation

The unit was advised to install a hydraulically operated lid over the furnace opening.

Implemented Scenario

As advised, the unit installed a hydraulically operated lid over the furnace opening.

This investment of INR 2.8 lakhs is saving 53,509 kWh annually, equivalent to INR 4.1 lakhs. The simple payback period is 0.7 year.

Other energy efficiency measures

No.	Energy efficiency measure	Investment (lakhs INR)	Annual savings (lakhs INR)	Simple payback period (years)
2	Reduction in tapping temperature of melting	–	1.7	–
3	Reduction in rejection by improving process response	–	1.3	–
4	Optimizing process to reduce interruptions	–	6.7	–
5	Reducing the leakage losses in compressed air system	–	3.3	–
6	Replacement of aluminium blade of cooling tower with FRP blade fan	0.3	0.6	0.5
7	Replacement of FTL T12 lighting fixtures with FTL T5 fixtures	0.03	0.03	1
	Totals	**0.3**	**13.6**	**(av.) 0.03**

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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