

MSME foundry unit invests Rs 23 lakhs on energy efficiency measures – and saves over Rs 36 lakhs annually in energy bill!

Background

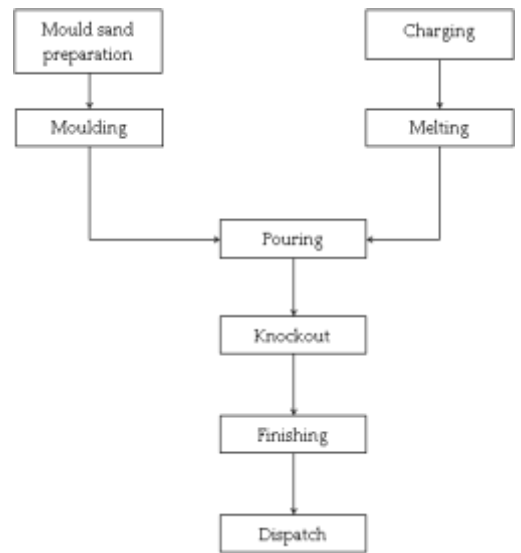
Kolhapur, in Maharashtra, is a foundry cluster. It has around 300 MSME foundries producing about 600,000 tonnes of castings annually, accounting for about 7–8% of India’s total castings production. The production capacity of these units varies from less than 1000 tonnes to over 10,000 tonnes per annum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

Unit profile

M/s **K22** is an MSME unit manufacturing graded cast iron (CI) and spheroidal graphite iron (SGI) castings. The annual production is about 2672 tonnes. The total annual energy bill of the unit was about INR 258 lakhs. The total annual energy consumption was about 370 tonnes of oil equivalent (toe) in the form of grid electricity.

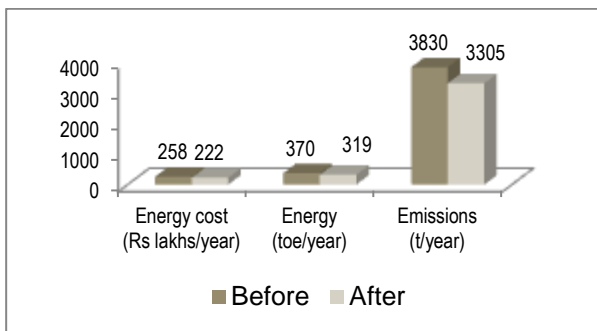
Process description

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
 14% reduction in total energy bill (i.e. annual savings of INR 36 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

Lid mechanism for the induction furnace

Baseline Scenario

The unit's induction furnace had a circular opening of 400 mm diameter without lid. As a result, radiation losses were high (32.7 kWh per batch).

Recommendation

The unit was advised to install a lid mechanism for the furnace.

Implemented Scenario

As advised, the unit installed a lid mechanism for its induction furnace to minimize radiation losses.



This investment of INR 5.6 lakhs is saving 208,380 kWh annually, equivalent to INR 12.7 lakhs. The simple payback period is 0.4 year.

Other energy efficiency measures

No.	Energy efficiency measure	Investment (lakhs INR)	Annual savings (lakhs INR)	Simple payback period (years)
2	Improving power factor and demand reduction	0.9	0.7	1.2
3	Installation of automatic voltage controller	14.2	3.9	3.6
4	Reduction in rejections by improving process response study	-	4.3	-
5	Quicker sampling, spectro-analysis, alloying and pouring	-	8.7	-
6	Arresting leakage in compressed air system	-	4.4	-
7	Optimizing pressure settings of three air compressors	-	0.3	-
8	Retrofitting air compressor with variable frequency drive (VFD)	2.5	1.1	2.3
9	Replacement cooling tower fan blades with FRP blades	0.1	0.2	0.5
10	Energy efficient lighting	0.5	0.1	5.0
Totals		18.2	23.7	0.7

**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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