

# MSME foundry unit invests in energy efficiency measures – and recovers investment in less than 18 months

## Background

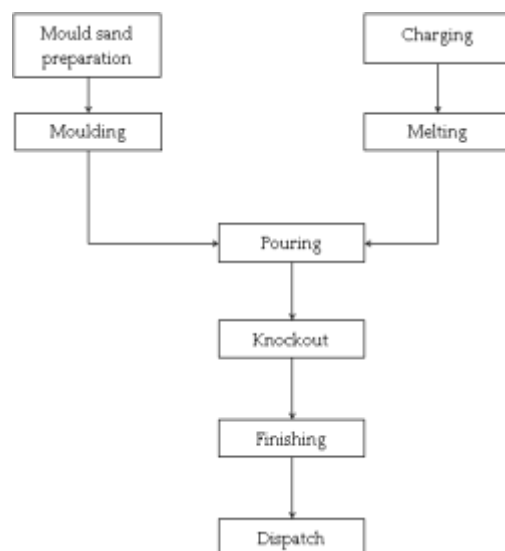
Kolhapur, in Maharashtra, is a foundry cluster. It has around 300 MSME foundries producing about 600,000 tonnes of castings annually, accounting for about 7–8% of India’s total castings production. The production capacity of these units varies from less than 1000 tonnes to over 10,000 tonnes per annum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

## Unit profile

M/s K19 is an MSME unit manufacturing graded cast iron (CI) castings. The annual production is about 1240 tonnes. The total annual energy bill of the unit was about INR 56 lakhs. The total annual energy consumption was about 110 tonnes of oil equivalent (toe), in the form of grid electricity.

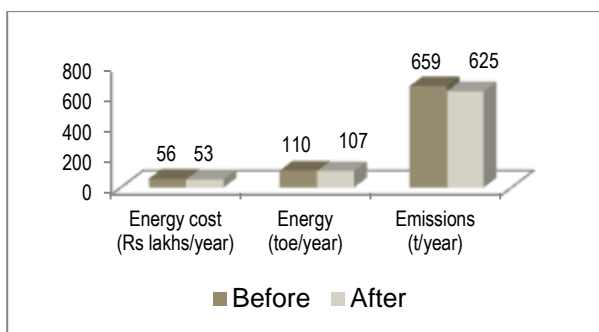
## Process description

The major process steps are mould preparation, melting, pouring, knockout and finishing. Fresh sand is mixed with adhesives in a sand mixer and then pressed into mould casings. The charge is melted in an induction furnace. The liquid metal is poured into the moulds, which are left to cool and then ‘knocked out’ manually to yield the castings. The sand is reused. The castings are sent for shot blasting, machining, and heat treatment to give the finished products.



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

## Overall Impact: post- implementation



**Overall Impact**  
 6% reduction in total energy bill (i.e. annual savings of INR 3 lakhs) with a simple payback of 1.4 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<sub>2</sub>. This project is being co-implemented by Small Industries Development Bank of India (SIDBI) and Bureau of Energy Efficiency

## INTERVENTIONS

### Replacement of existing sand mixer with energy efficient sand mixer

#### Baseline Scenario

The unit was using a sand mixer of 250 kg capacity, having a mixer motor of 10 kW and blender motor of 3.7 kW. Its efficiency was low, with cycle time of 9–12 minutes.



#### Recommendation

The unit was advised to replace this sand mixer with an energy efficient sand mixer.

#### Implemented Scenario

As advised, the unit replaced its existing sand mixer with a new sand mixer having a 15 kW mixer motor, a 7.5 kW blender motor, and a timer that is set at 2.5 minutes cycle time.



This investment of INR 4.4 lakhs is saving 15,250 kWh annually, equivalent to INR 1.3 lakhs. The simple payback period is 3.4 years.

### Reduction of compressed air leakage

The leakages in the compressed air piping system were measured to be 24%. As advised, the unit arrested the leakages to a great extent. At no cost, this measure is saving 15,990 kWh annually, equivalent to INR 1.4 lakhs.

#### Reducing rejections by improving process response

As advised, the unit conducted a process response study to analyse and address the reasons for rejections, which were brought down by about 1% (from 6% to 5.0%). At no cost, this measure is saving INR 0.4 lakh annually.

#### Re-positioning of air compressor to improve intake air quality

The unit's air compressor was positioned such that the intake air was dusty and hot (around 5° C hotter than ambient air). As advised, the unit re-positioned the air compressor such that the air intake was cooler and dust-free. At no cost, this measure is saving 582 kWh annually, equivalent to INR 0.1 lakh.

#### 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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