

# MSME foundry unit invests in energy efficiency measures, recovers investment in less than a year

## Background

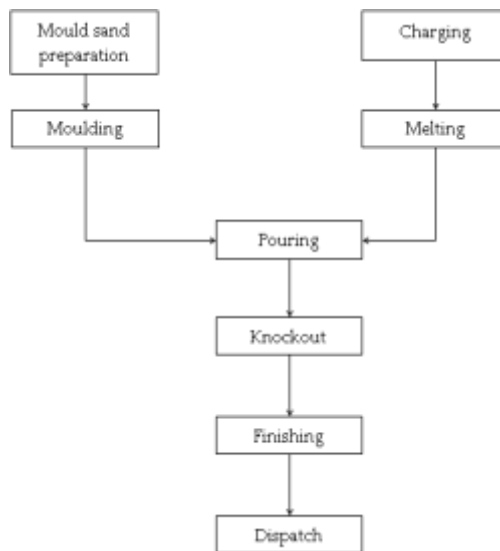
Kolhapur, in Maharashtra, is a foundry cluster. It has around 300 MSME foundries producing about 600,000 tonnes of castings annually, accounting for about 7–8% of India’s total castings production. The production capacity of these units varies from less than 1000 tonnes to over 10,000 tonnes per annum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

## Unit profile

M/s K14 is an MSME unit manufacturing graded cast iron (CI) and spheroidal graphite iron (SGI) castings. The annual production is about 2021 tonnes. The total annual energy bill of the unit was about INR 171 lakhs. The total annual energy consumption was about 210 tonnes of oil equivalent (toe), in the form of grid electricity.

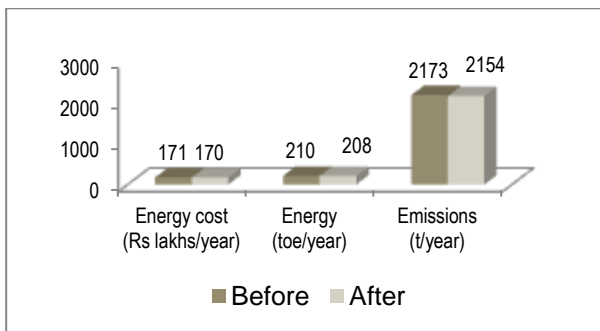
## Process description

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**  
 0.5% reduction in total energy bill (i.e. annual savings of INR 1 lakh) 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<sub>2</sub>. This project is being co-implemented by Small Industries Development Bank of India (SIDBI) and Bureau of Energy Efficiency

## INTERVENTIONS

### Retrofitting existing screw air compressor with variable frequency drive

#### Baseline Scenario

The unit's existing air compressor was being operated in unload position for about 58% of time. The power consumption during load-time was 17.7 kW and that of unload-time was 6.5 kW. The specific energy consumption of the air compressor was calculated to be 0.208 kW per cfm.

The unit retrofitted the air compressor with variable frequency drive (VFD) to minimize the power consumption. This investment of INR 1.2 lakhs is saving 21,670 kWh of electricity annually, equivalent to INR 1 lakh. The simple payback period is 0.8 year.

#### Recommendation

The unit was advised to downsize the air compressor to reduce the power consumption.

#### Implemented Scenario

Based on the project findings, the unit retrofitted the air compressor with variable frequency drive (VFD) to minimize the power consumption.

This investment of INR 1.2 lakhs is saving about 21,670 kWh of electricity annually, equivalent to INR 1 lakh. The simple payback period is 0.8 year.

#### 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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