

MSME foundry unit invests Rs 8 lakhs on energy efficiency measures – and saves Rs 7 lakhs year after year!

Background

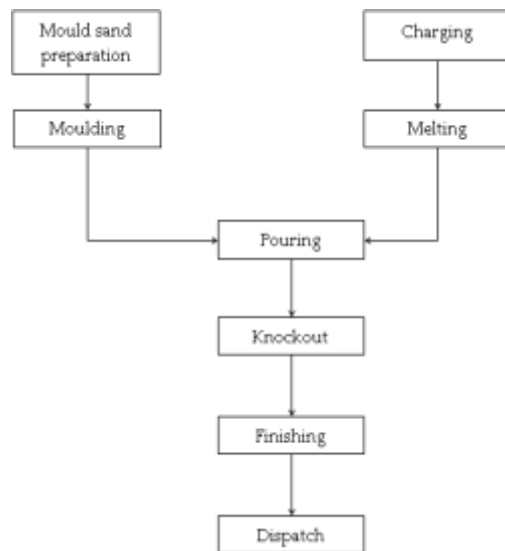
Kolhapur, in Maharashtra, is a foundry cluster. It has around 300 MSME foundries producing about 600,000 tonnes of castings annually, accounting for about 7–8% of India’s total castings production. The production capacity of these units varies from less than 1000 tonnes to over 10,000 tonnes per annum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

Unit profile

M/s K9 is an MSME unit manufacturing graded cast iron (CI) and spheroidal graphite iron (SGI) castings. The annual production is about 2910 tonnes. The total annual energy bill of the unit was about INR 236 lakhs, which was around 14% of total turnover. The total annual energy consumption was about 319 tonnes of oil equivalent (toe), in the form of grid electricity.

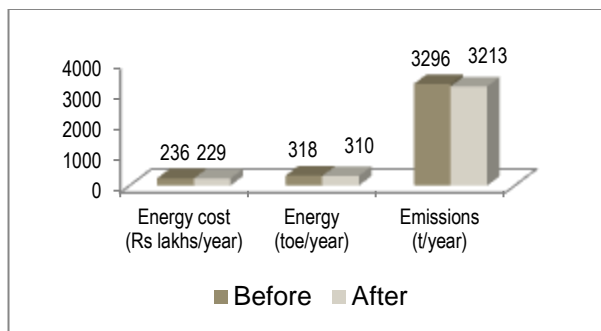
Process description

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 the electrical induction furnace and electrical motors associated with process equipment such as reaction vessels, pumps, etc.

Overall Impact: post- implementation



Overall Impact
 3% reduction in total energy bill (i.e. annual savings of INR 7 lakhs) with a simple payback of 1.2 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 CO₂. This project is being co-implemented by Small Industries Development Bank of India (SIDBI) and Bureau of Energy Efficiency

INTERVENTIONS

Down-sizing of existing screw air compressor

Baseline Scenario

The unit's existing screw air compressor was operating in unloading condition for about 61% of the cycle.



Recommendation

The unit was advised to replace this compressor with a new air compressor of lower capacity to improve reliability.

Implemented Scenario

As advised, the unit replaced its existing air compressor with a new air compressor of lower capacity. The old compressor is kept as standby.



This investment of INR 4.5 lakhs is saving 37,110 kWh of electricity annually, equivalent to INR 2.6 lakhs. The simple payback period is 1.7 years.

Replacement of existing raw water pump with energy efficient pump

The unit's existing heat exchanger cooling pump had an overall efficiency of 26%, which was lower than design efficiency. As advised, the unit replaced its existing raw water pump with a new energy efficient pump having the following specifications: flow rate—10.5 m³/hour; discharge head—43 m; motor power—2.8 kW; efficiency—51%. This investment of INR 0.7 lakh is saving 15,974 kWh annually, equivalent to INR 1.1 lakhs. The simple payback period is 0.6 year.

Replacement of existing soft water pump with energy efficient pump

The unit's existing furnace coil cooling pump had an overall efficiency of 28%, which was lower than design efficiency. As advised, the unit replaced it with an energy efficient pump having the following specifications: flow rate—10.5 m³/hour; discharge head—43 m; motor power—2.8 kW; efficiency—51%. This investment of INR 0.7 lakh is saving 15,254 kWh annually, equivalent to INR 1.1 lakhs. The simple payback period is 0.6 year.

Reducing pressure drop and leakage losses in compressed air system

The leakages in the existing compressed air piping system were very high (34%). As advised, the unit resized the piping and took steps to reduce the leakages to about 5%. This investment of INR 2.1 lakhs is saving 24,523 kWh annually, equivalent to INR 1.7 lakhs. The simple payback period is 1.2 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

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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