

MSME foundry unit slashes energy bill by 61% through energy efficiency measures – and recovers investment in 6 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).

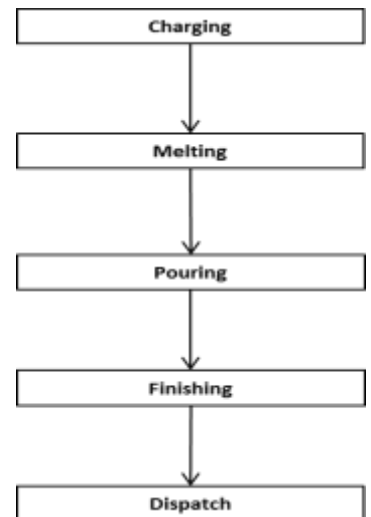
Unit profile

M/s **K2** is an MSME unit manufacturing aluminium castings. The annual production is about 70 tonnes. The total annual energy bill of the unit was about INR 14 lakhs. The total annual energy consumption was about 25 tonnes of oil equivalent (toe), of which furnace oil (FO) accounted for 94% (24 toe) and grid electricity 6% (1 toe).

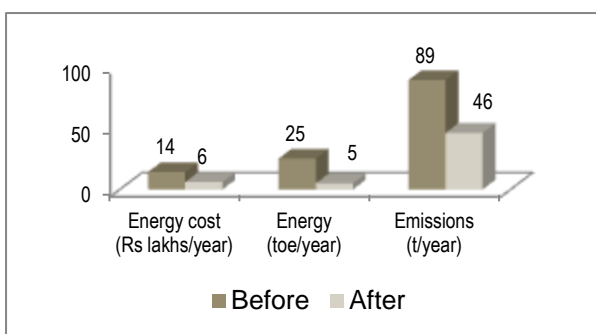
Process description

The major process steps are mould sand preparation and charge preparation followed by melting, pouring, knockout and finishing. The dies are pre-heated and coatings applied on them. The charge is melted in an FO-fired melting furnace. The liquid metal is poured into the dies. After cooling, the dies are ‘knocked out’ to yield the castings, which then undergo fettling and machining to give the finished products.

The main energy consuming equipments used were an FO-fired melting furnace and electrical motors associated with process equipment such as agitators, pumps, etc.



Overall Impact: post- implementation



Overall Impact
61% reduction in total energy bill (i.e. annual savings of INR 8 lakhs) with a simple payback of six months

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

Replacement of FO-fired furnace with electrical induction furnace

Baseline Scenario

The unit's FO-fired furnace of 100 kg capacity had a specific energy consumption (SEC) of 0.213 toe/t melting, which was very high for this category of furnace.



Recommendation

The unit was advised to replace this furnace with a 24 kW electrical induction furnace of 125 kg capacity.

Implemented Scenario

As advised, the unit replaced its FO-fired melting furnace with a 24 kW electrical induction furnace of 125 kg capacity, with digital temperature controller.



This investment of INR 3.9 lakhs is saving around 20.2 toe of energy each year, equivalent to INR 8.4 lakh. The simple payback period is 0.5 year.

Energy efficient lighting

As advised, the unit replaced all its 40W fluorescent tube lights (FTLs) having copper ballasts, with 28W FTLs having electronic ballasts. This investment of INR 0.06 lakh is saving 564 kWh annually, equivalent to INR 0.07 lakh. The simple payback period is 0.9 year.

Use of translucent sheet to reduce lighting load

The unit's shop floor had a 72W CFL, a 70W metal halide lamp and a 150W mercury vapour lamp. Earlier, these lamps were switched on in the afternoon and operated for six hours till night. As advised, the unit installed translucent sheets on both side walls of the shop floor so as to reduce the usage of lighting to about five hours daily. This investment of INR 0.1 lakh is saving 330 kWh annually, equivalent to INR 0.04 lakh. The simple payback period is 2.6 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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