

# MSME casting unit invests Rs 6 lakhs in energy efficiency measures – and saves Rs 15 lakhs annually!

## Background

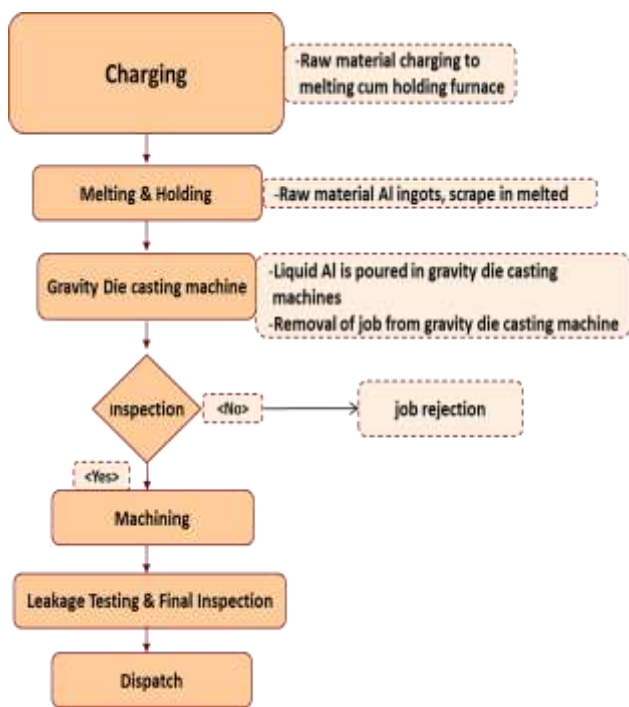
Pune, in Maharashtra, is a forging industry cluster. Large-scale units account for about 65–70% of the cluster’s forging production, while MSMEs account for the remaining 30–35%. There are over 50 MSMEs producing forged components, with 20 heat treatment MSMEs functioning as their vendors. The production capacity of these units varies from 500 tonnes to over 3500 tonnes per annum (tpa).

## Unit profile

M/s P19 is an MSME unit that manufactures aluminium castings for automobile parts like intercooler, valve body, ventilator fan, etc., producing about 1480 tpa. The annual energy bill of the unit was INR 188 lakhs, which was around 8% of total turnover. The annual energy consumption was around 307 tonnes of oil equivalent (toe), of which furnace oil (FO) accounted for 77% (238 toe), grid electricity 19% (57 toe), LPG 2% (7 toe) and diesel 2% (5 toe).

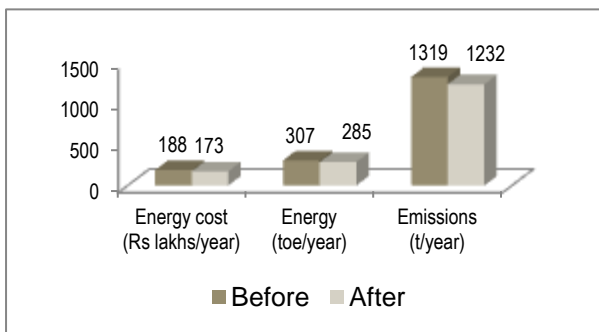
## Process description

Aluminium ingots are charged into an FO-fired melting furnace, from which the molten aluminium is drawn into an electrical melting-cum-holding furnace, and then poured into a gravity die casting machine to make the castings. The castings are then machined as per specifications to give the final products.



The major energy consuming equipments used were three FO-fired melting furnaces, three electrical melting-cum-holding furnaces, LPG-based gravity die casting machine, and electrical motors associated with process equipment such as air compressor, pumps, etc.

## Overall Impact: post- implementation



**Overall Impact**  
 8% reduction in total energy bill (i.e. annual savings of INR 15 lakhs) with a simple payback of 5 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 CO<sub>2</sub>. This project is being co-implemented by Small Industries Development Bank of India (SIDBI) and Bureau of Energy Efficiency

## INTERVENTIONS

### Relining of two FO-fired melting furnaces

#### Baseline Scenario

Two of the unit's FO fired melting furnaces (each of capacity 500 kg per batch) showed high surface heat losses, estimated at 21,593 kCal/hour and 19,063 kCal/hour respectively.



#### Recommendation

The unit was advised to reline these two furnaces to minimize surface heat losses.

#### Implemented Scenario

As advised, the unit relined its two 500 kg/hour FO-fired melting furnaces. This reduced surface heat losses and also improved the working atmosphere near the furnaces.



This investment of INR 4.6 lakhs is saving 19,567 litres of FO annually, equivalent to INR 10.2 lakhs. The simple payback period is less than six months.

### Relining of electrical holding furnace

One of the unit's electrical holding furnaces, of 500 kg capacity, showed high surface heat loss ( 9494 kCal/hour). As advised, the unit relined this furnace, reducing heat loss and improving the working atmosphere. This investment of INR 1 lakh is saving 26,601 kWh of electricity annually, equivalent to INR 2.1 lakhs. The simple payback period is six months.

#### Improving power factor to unity

The average power factor (PF) of plant was 0.90. As advised, the unit installed additional capacitors of appropriate rating totalling 36 kVAr in the existing APFC panel to maintain the PF at unity. This investment of INR 0.1 lakh is saving INR 2.1 lakhs annually. The simple payback period is less than a month.

#### Optimization of compressed air generation pressure

The unit's three reciprocating air compressors had their operating pressures set to 8 bar. As advised, the unit reset the air pressures to 7 bar. At no cost, this measure is saving 7731 kWh of electricity per year, equivalent to INR 0.6 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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