

31% reduction in Energy bill of a Die Casting MSME unit through Energy Efficiency Measures

Background

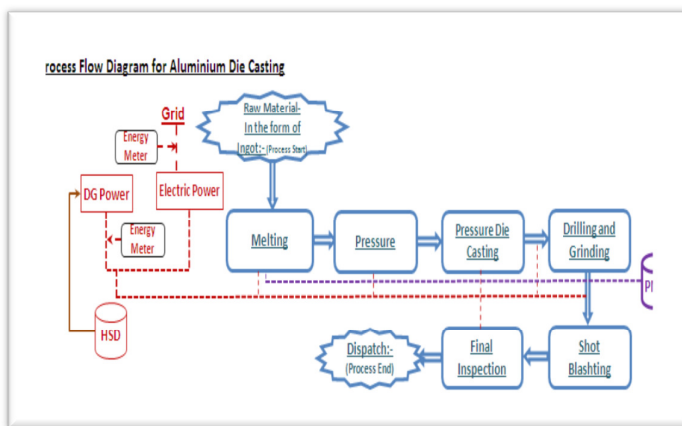
Faridabad is a mixed cluster in Haryana having over 12000 MSMEs majorly manufacturing various kinds of automobile parts, sheet metal components and fabrics. There are majorly 15 industrial segments in the cluster with a high range of products from soaps to tractors.

Unit Profile

M/s ABC is an MSME unit engaged in manufacturing of Aluminium & Zinc die casting components and brake lining. Total Energy bill of the unit was Rs.232 lakh. per annum which was around 10% of total turnover. About 65% of the unit’s energy bill was on account of Piped Natural Gas, 21% accounted for Grid electricity and remaining 14% accounted for HSD-DG.

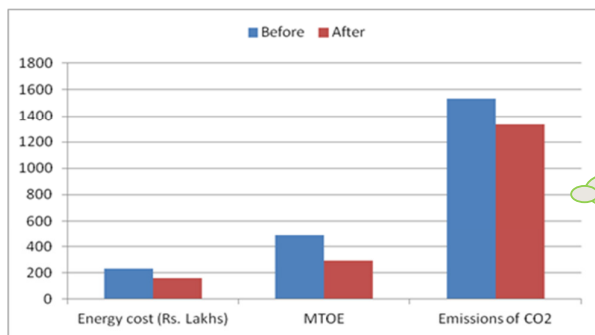
Process description

The manufacturing process involves the melting of aluminium ingot in a furnace up to 700°C and manually fed to Pressure Die Casting (PDC) Machine. Here cold chamber process is used for Die Casting in Horizontal Pressure Die Casting (PDC) Machine. These casted components are inspected for the casting defects. There after casted component sent to machine shop for drilling & Grinding. These machined components sent for quality checking. Final products are packed and stored for dispatch.



Piped natural Gas, Grid Electricity and HSD were used to operate major energy consuming equipments in the unit i.e. air compressors cooling towers and other utilities i.e. HVAC, pumps, motors associated with, and lighting.

Overall Impact - Post implementation



Overall Impact

31% reduction in Total Energy bill (i.e. savings of INR 79.27 lakh p.a.) Simple payback of 9 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 (BEE).

INTERVENTIONS

Replacement of the existing PNG fired furnace With Electric powered furnace

Baseline Scenario

All the furnaces in the unit were PNG fired furnaces. They were operating at average 7% efficiency, which was relatively low due to high flue gas temperature causing high heat loss in flue gas and high percentage of oxygen in flue gas causing loss of fuel and unaccounted loss in furnace due to opening, leakage etc. Furnaces with a total production capacity of 1177MT/year were consuming around 198488 standard cubic meter (SCM) of PNG annually

Recommendation

The unit was advised to replace the existing PNG-fired furnace with a energy efficient electric powered furnace.

Implemented Scenario

Based on the project's recommendation, the unit replaced PNG-fired furnace with electric powered furnace of same capacity.

Newly installed furnaces consume 412020 kWh per annum.

The Investment of Rs.23 lakh made by the unit has resulted in monetary savings in energy cost of Rs.44 lakh per year with simple payback period of only seven months.

Preheating of Combustion Air

The average flue gas temperature coming out of melting furnace is in the range of 700-800°C. Flue gas was directly being exhausted to atmosphere.. As suggested, the unit has installed a waste heat recovery system to preheat the combustion air. This has helped the unit to reduce heat loss in flue gas and fuel consumption.

Cooling Tower Optimization

The unit had a cooling tower fan which ran for whole year without any automation. With the suggested recommendation, the unit has installed an automation system which automates the CT fan by monitoring hot and cold water temp. This has resulted in an annual energy saving of 32,000 kWh of electricity, equivalent to about Rs. 2.53 lakh per year.

Support provided under the Project

- Walk Through & Detailed Energy Audit
- Identification of Energy Efficiency Interventions in the unit
- Finalization of the specifications for the Energy Efficiency Interventions
- Identification of technology providers/vendors
- Facilitation for an interactions between the unit and technology providers;
- Technical support during commissioning
- Monitoring & Verification

Disclaimer: This case study has been compiled by DESL on behalf of SIDBI under WB GEF Project. While every effort has been made to avoid any mistakes or omissions, any agency would not be in any way liable to any person by reason of any mistake/ omission in the publication.

For Further Information please contact at

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