Replacing standard motor with energy efficient motor in hammer in a forging unit

Tags

Type: Unit case study

Sub-sector: Forging

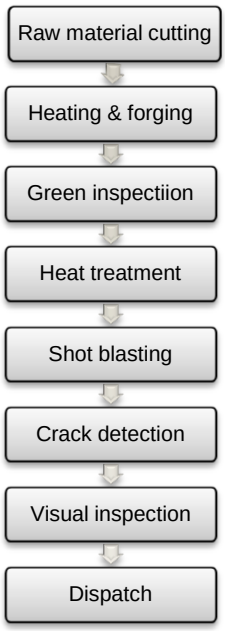
Location: Pune

Partners: GEF, World Bank, SIDBI, BEE, TERI, Association of Indian Forging Industry (AIFI)

Year: 2012–14

Cluster background

Pune (Maharashtra) is one of the important forging industry clusters located in India. There are more than 50 MSMEs in the cluster involved in the production of forged components, with 20 heat treatment MSMEs functioning as their vendors. The production capacity of MSME units is in the range of 500–3500 tonnes per annum (tpa).Large forging units account for about 65–70% of total production in the cluster, while MSMEs account for about 30–35%.



Unit profile

The MSME forging unit **P11** manufactures forged components such as gears and shafts. The average production of the unit is about 1160 tonnes per year. The total annual energy bill of the unit was Rs 119 lakhs, which was around23% of the total turnover. The first step in the manufacturing process in the forging unit involves cutting of steel rods in the form of billets. The billets are heated in the forging furnace, forged with hammers and presses, trimmed, and subjected to heat treatment to give the final products.

Energy consumption

The main energy consuming equipment used in the unit were three natural gas (NG)-fired forging furnaces. Other equipment included hammer, press, air compressor, pump, etc. The annual energy consumption was around 259 tonnes of oil equivalent (toe), of which natural gas (NG) accounted for 90% (234 toe) and grid electricity 10% (25 toe).

Intervention

The energy audit revealed that the 1-tonne hammer in the unit had a low-efficiency Eff3 class motor. As recommended by the energy audit, the unit replaced this inefficient motor in the hammer with a new energy efficient Eff1 class motor. This investment of Rs 1.3 lakhs is saving 5848 kWh of electricity

The unit replaced the old, rewound inefficient motor in hammer with an energy efficient motor

annually, equivalent to Rs 0.5 lakhs. The simple payback period is 2.4 years. The GHG reductions with installation of energy efficient motor are about 5.2 tonnes CO_2 per year.