Replacing NG-fired forging furnace with induction billet heater in a forging unit

Tags

Type: Unit case study

Sub-sector: Forging

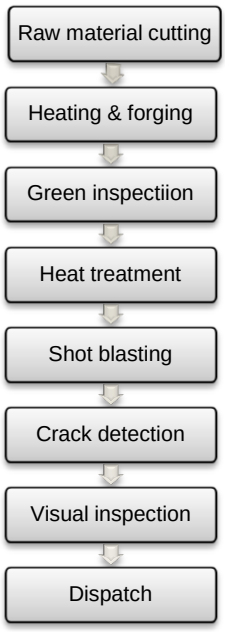
Location: Pune

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

During the energy audit, it was found that one of the NG-fired forging furnaces (of capacity 200 kg/hour, associated with 800 tonne forging press), was operating with very low efficiency, measured at under 7%. As per the recommendations of the energy audit, the unit replaced the inefficient NG-fired forging furnace with an energy efficient, 175 kW induction billet heater having capacity of 450 kg per hour. The induction billet heater consumes 173,086 kWh of electricity annually, but avoids

The unit replaced its inefficient NG-fired forging furnace with an energy efficient induction billet heater

consumption of 106,623 standard cubic metres (SCM) of NG. This investment of Rs 64.1 lakhs is saving Rs 26 lakhs annually. The simple payback period is 2.5 years. The GHG reductions with veneering of the normalizing furnace are about 33 tonnes CO_2 per year.