

## 10% reduction in energy bill of a fastener manufacturing MSME unit through Energy Efficiency Measures

### Background

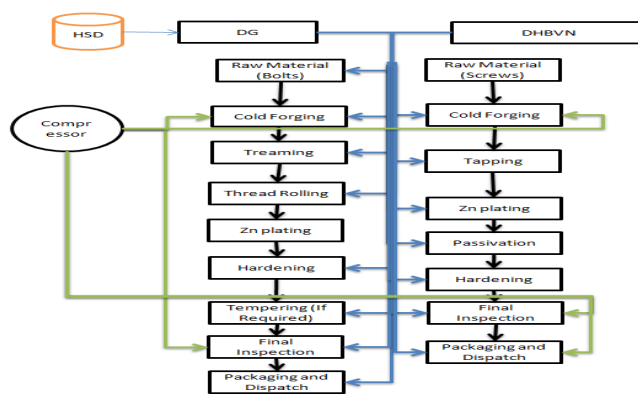
Faridabad is a mixed cluster in Haryana having over 12000 MSMEs majorly manufacturing various kinds of automobile parts, sheet metal components and fabrics. There are majorly 15 industrial segments in the cluster with a high range of products from soaps to tractors.

### Unit Profile

M/s ABC is an MSME unit engaged in manufacturing of nuts and screw parts and assemblies for automobile companies producing about 560 tpa. Total Energy bill of the unit was Rs.17.5 lakh per annum which was around 7% of total turnover. About 86% of the unit's energy bill was on account of Grid Electricity and remaining 14% accounted for Diesel-DG.

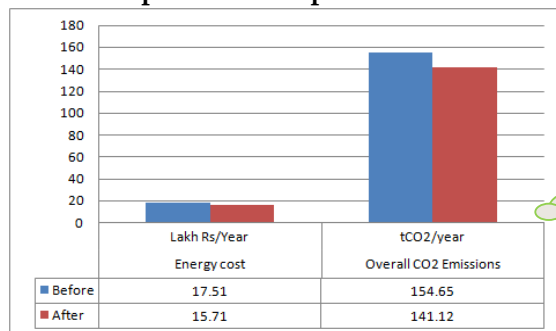
### Process description

The manufacturing process is as follows: For nut, the raw material generally is in the form of metal coils. After inspection of raw material it is sent for nut forming. Raw material is sent for Nut forging machines where these are drawn into nuts. Then these nuts are taken for tapping using tapping machine, diesel is used for lubrication of these nuts. Tapping is followed by zinc plating, and then final final inspection is done. For making screw, same raw material, i.e. metals coils are send to header machine, followed by forging. To maintain particular carbon content in the component, ammonia is used in the furnace. Then the screw is trimmed; followed by thread rolling machine the final material is packed and dispatched.



Diesel and Grid Electricity were used to operate major energy consuming equipments in the unit i.e. furnace, nut former machines, tapping machines and other utilities i.e. pumps, motors associated with equipments, and lighting.

### Overall Impact - Post implementation



**Overall Impact**  
 10% reduction in Total Energy bill (i.e. savings of INR 2 lakh p.a.) Simple payback of 27 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 (BEE).*

## INTERVENTIONS

### Replacement of Reciprocating compressor with Screw compressor

#### Baseline Scenario

In the unit, the requirement of compressed air was not found to be high and for same air requirement, the two nos of compressors of 7.5 kW rating were operated and the energy consumption was very high. The average power consumption was 11.17 kW and the specific energy consumption was 0.22 kW/CFM. The annual energy consumption was around 40,000 kWh.

#### Recommendation

The unit was advised to replace the 2 nos of reciprocating compressor with one screw compressor of 11.1 kW.

#### Implemented Scenario

Based on the project's recommendation, the unit replaced reciprocating compressors with screw compressor.

Newly installed system consumes 29253 kWh of energy per annum.



The Investment of Rs.2.7 lakh made by the unit has resulted in monetary savings in energy cost of Rs.1 lakh per year with simple payback period of 37 months.

#### Cut off pressure reduction of compressed air

The average cut off pressure of the compressed air was 9 kg/cm<sup>2</sup>. As suggested, the unit has reduced the cut off pressure to 8 kg/cm<sup>2</sup>. This has helped the unit to reduce the loading period of the compressor and the overall energy consumption by the compressor.

#### Optimization of DG frequency

The average frequency of the DG was around 50.15 Hz. With the suggested recommendation, the unit has maintained the frequency at 49.5 Hz. This has resulted in an annual fuel saving of 635 liters, equivalent to about Rs. 30,000 per year with simple payback period of four months.

#### 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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