

CASE STUDY

Engineering unit saves over 3 lakh rupees annually by replacing diesel forklift truck with electric forklift truck

BACKGROUND

Forklift trucks (FLT) are used in multiple applications in the workshop involving the movement of goods and materials from storage areas or from one workstation to another. Some uses involve transport at ground level, while others involve lifting or lowering. The load carrying capacity of the FLT in the workshop ranges between 3–10 tonnes (t). Forklifts can be used from a few hours to 8–12 hours per day, 6 days a week. Some forklifts are used indoors, while others serve outdoor purposes. Diesel is used as fuel in the existing FLT.

Many of the FLT work in indoor shed areas of the plant. The noise and fugitive emissions from diesel FLT are detrimental to the workplace environment. Replacing the diesel FLT with electric FLT can eliminate emissions and also lead to significant reductions in direct operating and maintenance costs.

Baseline

An engineering unit in Hooghly, West Bengal, had a 3t diesel FLT for material handling. The annual fuel consumption of the diesel FLT was estimated as follows:

| | |
|---|-------|
| No. of diesel operated forklift running (#) | 1 |
| Capacity of the forklift (t) | 3 |
| Average fuel consumption (litres/h) | 2.5 |
| Annual running time (h) | 1,800 |
| Annual diesel consumption (litres) | 4,500 |



Figure 1: Electric Forklift

Electric FLT offers several environmental and practical advantages. These are fume-free during operation, emitting no harmful emissions into the environment. This is particularly important for indoor use or in areas where air quality is a concern. Electric FLT are also much quieter compared to their diesel or gas counterparts.

While the initial cost of purchasing an electric FLT may be higher than that of a diesel one, the cost of recharging the battery on solar power or low-rate night tariff is less. Overall, electric FLT offer a more environmentally friendly and cost-effective solution for businesses, particularly those focused on sustainability and reducing their carbon footprint.

ELECTRIC FORKLIFT & ENERGY SAVINGS

As recommended by an energy audit in 2023, the unit replaced its diesel FLT with an electric FLT of the same capacity. The average electricity consumption of the electric FLT was estimated as follows:

| | |
|--------------------------------------|--------|
| No. of electric forklift | 1 |
| Capacity of the forklift (t) | 3 |
| Average power consumption (kW) | 8.37 |
| Annual running time (h) | 1,800 |
| Annual electricity consumption (kWh) | 15,066 |

Implementation of the electric FLT resulted in reduction of energy consumption by 3.6 toe/year, equivalent to saving 3300 litres diesel per year and a yearly monetary saving of INR 3.1 lakhs. The investment required for the new electric forklift was INR 9 lakhs. The simple payback period

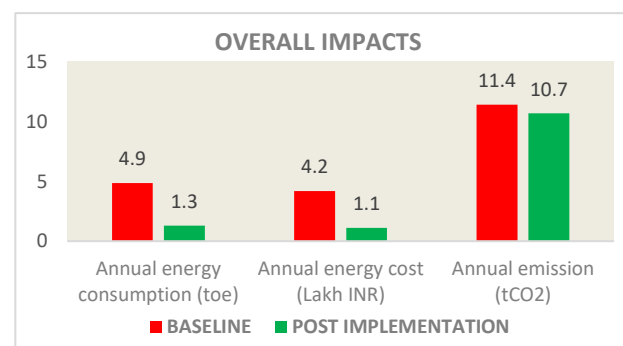


Figure 2: Energy and cost savings and emission reduction on investment was 2.9 years. The annual emission reduction was about 0.7 tCO₂. The overall impact of this measure is depicted in Figure 2.

For more details, please contact

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