

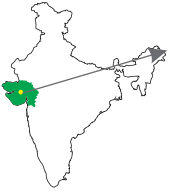
“Promoting Energy Efficiency and Renewable Energy in selected MSME clusters in India”

With an aim to develop and promote a market environment for introducing energy efficiency and enhanced use of renewable energy technologies in process applications in the selected energy-intensive MSME clusters, United Nations Industrial Development Organization (UNIDO), in collaboration with Bureau of Energy Efficiency (BEE), is implementing a project titled “Promoting Energy Efficiency and Renewable Energy in selected MSME clusters in India” funded by Global Environment Facility (GEF) and co-financed by Ministry of Micro, Small and Medium Enterprises (MoMSME) and Ministry of New and Renewable Energy (MNRE). The project supports MSME units in implementing various energy conservation measures and thus result in reduced energy consumption and Green House Gas (GHG).

A GEF-UNIDO-BEE Project

Installation of Fiber Reinforced Plastic (FRP) Blades

Company Profile



Mogar Chocolate Production Plant, located at **Mogar, Gujarat**, is the only chocolate plant in the entire network of the Gujarat Co-operative Milk Marketing Federation (GCMMF). GCMMF is the apex body of all the district milk unions of Gujarat that markets brand 'Amul' - fourth largest chocolate brand in the country after Cadbury, Ferrero and Nestle.

Objective



Improve the cooling tower fan efficiency by introducing Fiber Reinforced Plastic (FRP) bladed fans. The FRP bladed fans have a better aerodynamic profile and are light-weight. These light-weight blades reduce the load on the motor and as a consequence energy consumption is also reduced.

Intervention



Replacement of existing metallic bladed fans installed at cooling tower with lightweight and more efficient FRP bladed fans.

Outcomes



- Annual electricity savings : 9720 kWh
- Annual monetary savings : ₹ 0.65 lakhs



Principle

- ❖ Metallic blades used for cooling towers are heavy. This results in more energy consumption by the fan motor.
- ❖ Lighter Fiber Reinforced Plastic (FRP) bladed fans results in lower power consumption as compared to metallic bladed fans.



Implementation

- ❖ The existing heavier metallic bladed fans installed at cooling tower were replaced with latest lightweight and more efficient FRP bladed fans.
- ❖ Lighter FRP bladed fans consume approx. 15% lesser energy as compared to conventional metallic bladed fans.



Metallic Bladed Fan



Fiber Reinforced Plastic Bladed Fans



Activity conceived and implemented with technical help from project



Cost-Economics

Total no. of cooling tower fans	02
Saving per day	27 kWh
No. of working days per annum *	360 days
Expected savings per annum	9720 kWh
Cost of electricity	₹ 6.88/kWh
Expected savings per annum	₹ 66874
Cost of two CT fans (as specified above)	₹ 70000
Total investment (including installation)	₹ 84000
Payback period	~ 15 Months

* Assumption

FRP Bladed Fans inside Cooling Tower



RESULTS

Annual electrical energy saving of around **66874 kWh/annum** worth **INR 0.65 lakhs**.

Annual reduction of **55 tonnes of CO₂** emission.

FRP Impeller has better air flow rate

Lower energy consumption for same air flow

Improved corrosion and erosion resistance.

Light in weight compared to the conventional fans resulting in increased life of the mechanical drives of the fan.

Lower noise levels.



Replication Potential

This type of measure can be implemented in all existing cooling towers running with conventional metallic bladed fans.

A very well proven and simple measure to be implemented with no risk involved.

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