"PROMOTING ENERGY EFFICIENCY AND RENEWABLE ENERGY IN SELECTED MSME CLUSTERS IN INDIA"

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).

Installing a condensate recovery system for a boiler in a dairy plant to minimize energy consumption

Objective

To reduce energy consumption in a boiler by installing a condensate recovery system.

Implementation

Installed a condensate recovery system to recover about 85% of condensate at 80 - 85°C, which was being discarded earlier.

Principle

Steam condensate from the boiler is at 80 - 85°C. Heat content in this condensate is about 20% of the total heat utilized in the boiler for steam generation. If this condensate water is added back to the boiler (in feed water), it will decrease the energy consumed by the boiler significantly and also reduce the amount of fresh water needed for the boiler application.

Savings
₹ 7,11,111

Investment
₹ 3,20,000

Pay Back
6 months

Unit Profile

Amul Fed Dairy is the apex organization of the Dairy Cooperatives of Gujarat. It manufactures products like milk, butter milk, flavoured milk, lassi, ghee and ice cream, etc.

Benefits

➢ **Reduced fuel consumption**
➢ **Reduction in fresh water requirement**

Outcomes

148.15 T of annual biomass saving

₹ 7,11,111of annual cost saving

Cost Economics

Steam generation per hour	**5 T**
Hours of operation	**16 hours**
% of recovery of condensate	**50%**
Condensate recovered per day	**40 T at 50°C**
Heat content in the condensate per day	**12,00,000 kCal**
Efficiency of the boiler	**81%**
Biomass saved per day (CV: 3,600 kCal)	**0.411 T/day**
Biomass saved per year (360 days/year)	**148.15 T**
Cost saving per year (₹ 4,800/T)	**₹ 7,11,111**
Investment cost	**₹ 3,20,000**
Simple payback period	**6 months**

Replication Potential

In all units where condensate from boiler is not utilised back and drained out

Calculation

Fuel saved per year, kg = (heat content in the condensate per day, kCal/day * 360 days/year)/(efficiency of the boiler * calorific value of the fuel, kCal/kg)

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