

"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 plate heat exchanger (PHE) to recover waste heat from a yogurt making process in a dairy unit

Objective

To reduce energy consumption in the yogurt making process by recovering the waste heat from it in a dairy unit.

Implementation

Installed a PHE to utilize the waste heat from heated milk in the yogurt making process in preheating the cold milk in the yogurt making process.

Principle

In yogurt making process, milk is first heated up to 111°C and then cooled back to 8°C. In this process, heat is rejected into the environment. By installing a PHE, this rejected heat is recovered and utilized to preheat the cold milk. This reduces the load on the boiler and results in fuel and energy saving.



₹ 8,65,200



Investment

₹ 4,20,000



Pay Back

6 months



Unit Profile

Sumul Dairy is a unit of The Surat District Co-operative Milk Producers' Union Ltd. This union is one among the 17 district unions which acts as manufacturing units of dairy products for Gujarat Co-operative Milk Marketing Federation Limited.

Benefits

- **Reduced load on boiler**
- **Reduced energy consumption and energy costs**



Outcomes



28,840 SCM of annual natural gas saving



₹ 8,65,200 of annual cost saving



65.7 T of CO₂ reduction per year (56.1 kg/GJ of Natural gas)

Cost Economics

Fuel saved due to preheating per day 82.4 SCM/day

Fuel saved per year (350 days/year) 28,840 SCM

Cost saving per year (₹ 30 / SCM) ₹ 8,65,200

Investment cost ₹ 4,20,000

Simple payback period 6months



Replication Potential

In all units with potential to recover heat, where currently heat is rejected to atmosphere



Calculation

Fuel saved per day, SCM = $\frac{\text{heat gained by the feed water, kCal/day}}{\text{calorific value of the fuel, kCal/SCM}}$

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Unit

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