

## "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).

### Methane capture from an anaerobic digestion of a dairy effluent and use it as fuel

#### Objective

To use the methane captured from anaerobic effluent treatment as fuel in the boiler.

#### Implementation

Modified the effluent treatment from aerobic digestion to anaerobic to produce the methane gas. This produced gas is captured to use as fuel in the boiler.

#### Principle

Dairy effluent usually has high organic carbon content. This effluent, when treated using anaerobic digestion process produces methane gas as by-product instead of producing CO<sub>2</sub> with aerobic treatment process. This methane gas can be easily captured and utilized as fuel in many applications such as boiler or canteen cooking etc.



**₹ 34,98,880**



**Investment**

**₹ 58,00,000**



**Pay Back**

**20 months**



## Unit Profile

Baroda dairy was established in the year 1961 at Vadodara. The dairy has 50 kL per day of milk processing capacity. It manufactures various milk based products such as butter, paneer, sweets, ice cream and yogurt, etc.

## Benefits

- Use of renewable energy
- Production of methane gas
- Reduced fossil fuel consumption and energy costs



## Outcomes



1,09,340 SCM of annual methane gas production



₹ 34,98,880 of annual cost savings



245.3 T of CO<sub>2</sub> reduction per year (56.1 kg/GJ of methane gas)

## Cost Economics

Methane gas produced per day	308 SCM
Methane gas produced per year	1,09,340 SCM
Annual cost savings ( ₹ 32/SCM)	₹ 34,98,880
Investment cost	₹ 58,00,000
Simple Payback period	20 months



## Replication Potential

In all the units with aerobic treatment of effluent with high organic carbon content



## Calculation

Cost savings = biogas produced per day, m<sup>3</sup> \* cost of biogas, ₹ /m<sup>3</sup> \* no of operating days per year

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