



ENERGY EFFICIENCY SERVICES LIMITED
A JV of PSUs under the Ministry of Power




Ministry of Micro, Small and Medium Enterprises,
Government of India



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

Ministry of micro, small and medium enterprises (MoMSME), Government of India in association with United Nations Industrial Development Organization (UNIDO) is implementing a project funded by Global Environmental Facility (GEF) titled “Promoting Market Transformation for Energy Efficiency in Micro, Small and Medium Enterprises” in India. Energy Efficiency Services Limited (EESL) is the implementing partner for the project.

The overall project objective is to promote the implementation of energy efficiency in the MSME sector; to create and sustain a revolving fund mechanism to ensure replication of energy efficiency measures in the sector; and to address the identified barriers for scaling-up energy efficiency measures and consequently promote a cleaner and more competitive MSME industry in India. The project envisages to extend support to 470 MSME units across 10 identified energy intensive MSME clusters with a target of reduction of energy consumption by 110,000 tonnes of oil equivalent and greenhouse gas emissions by 1 million tonnes of CO₂ emission, leveraging an investment of USD 150 million towards energy efficiency, during its tenure.

CASE STUDY - 5

Installation of Automation and Control System for Withering Troughs (8 Nos. of Enclosed Troughs)

Objective:

Withering is one of key processes in the tea processing industry. The withering fans rotates to provide the air for removal of moisture, but there is no control system to regulate the air flow with respect to the ambient conditions and RH and temperature of the leaves in the troughs. Also natural gas fired burners are used to provide the heat required in the withering process. The burners have no control. In most cases, operation of the fans and the burners depends on the supervisor; wherein significant amount of energy is wasted due to lack of continuous monitoring. Converting to an automatic operation of the trough can lead to process optimization resulting in energy and cost saving.

Implementation:

The unit has 8 Nos. of enclosed withering troughs which were operated without any automation. The project supported the installation of automation and control system in the existing withering troughs helping the unit to become energy efficient and cost competitive.

Principle:

Withering is principally a drying process to remove the surface moisture and partially the internal moisture of the freshly harvested green leaves. The withering troughs are equipped with fans and natural gas fired burners which are operated to provide the required air for withering. In case of enclosed troughs, the dampers are controlled to enable free movement of air. The automation and control system installed in the withering troughs is a recipe based control system which controls the air flow in the fan using a VFD, fuel flow in the burner using a solenoid valve and automatic control of the damper. All these operates for a fixed duration as per fed data into the PLC system, leading to process optimization and energy saving.

Implementation partner





Unit Profile

Premier Tea Estate, located at Golghat, Assam was incorporated in the year 1992. The company is one of the leading bought-leaf producer in the cluster producing premium quality CTC tea. There are over 25 regular employees in the unit.

Benefits



- ◆ Reduction in electrical energy consumption by 10-15%
- ◆ Reduction in Natural Gas consumption by 10-20%
- ◆ Reduction in maintenance cost by 10-15%
- ◆ Lesser withering process time
- ◆ Better quality of withered leaves due to reduced burn-outs



Withering troughs



Automation System

Project Economic

Savings

₹ 5,91,000

Investment

₹ 15,70,000

Payback

2.6 Y (31 months)

Project Impacts



16,125 kWh of annual electrical saving



2,962 SCM of annual NG savings



4.3 TOE of annual energy savings



16.4 tCO₂ GHG emission reduction per year

Cost Economics

Electrical energy Consumption (Baseline)	73,297 kWh/year
Electrical energy Consumption (Post Implementation)	57,171 kWh/year
NG Consumption (Baseline)	13,464 SCM/year
NG Consumption (Post Implementation)	10,503 SCM/year
Electrical Energy Savings	16,125 kWh/ year
NG Saving per Annum	2,962 SCM/ year
Annual Monetary Saving	Rs. 6,28,000
Investment	Rs 15,70,000
Simple Payback	31 month

Replication Potential



The technology has significant replication potential across the sector. In Jorhat Tea Cluster, the replication potential is expected in 19% of the units i.e. around 78 units.

Calculation

Savings in terms of energy : Baseline energy consumption– Post Implementation energy consumption.



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