



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




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



PROMOTING MARKET TRANSFORMATION FOR ENERGY EFFICIENCY IN MICRO, SMALL & MEDIUM ENTERPRISES

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 - 1

Installation of Energy Efficient Modulating Burner in Tea Dryers (Dryer 1 @450 kg/h; Dryer 2@250kg/h)

Objective:

Tea industries have a significant demand for piped natural gas for drying operation. Most of the dryers are equipped with pipe burners in the dryers; these burners are controlled manually based on experience of the operator. These burners consume significant energy. The project envisaged saving in terms of energy through technology up gradation.

Implementation:

The unit replaced two numbers of conventional pipe burners with step-less modulating burners in dryers of 450kg/h and 250 kg/h capacity each. The project supported replacement of the existing pipe based conventional burner with energy efficient modulating burners equipped with a closed loop PID based control system.

Principle:

Drying is a simultaneous heat and mass transfer process, where heat is supplied to wet tea by heated air and the evaporated moisture is carried away by the air. The purposes of drying tea are to hold fermentation, remove moisture and produce good quality tea with good keeping quality. Dryers are used in Tea cluster for the drying purpose.

The burners implemented under this project are with **variable gas/air ratio setting**, which is set automatically by the servo motor of the burner. The gas flow and corresponding air flow is controlled based on closed loop PID controller which monitors and controls the dryer temperature to its set value. The burner keeps the air to gas ratio fixed throughout the firing range which results in gas savings as compared to conventional pipe burners. This type of burner is called step-less modulating burner.

Implementation partner

DESL



Unit Profile

Dhanshree Tea Industries, incorporated in the year 2005, is a leading CTC tea producer in the region. The unit produces close to 15,00,000 kg of made-tea annually. Located at Titabor, Jorhat, Assam, the plant has state-of-the-art facilities to produce good quality tea. The unit is equipped with two numbers of dryers to cater to their drying requirements.

Benefits



- ◆ 10% to 15 % cost saving
- ◆ Proper Air-fuel ratio
- ◆ Step less fully modulating operation over the range
- ◆ 3% to 5% maintenance cost reduction



Before



After

Project Economic

₹ Savings

₹ 9,33,000

₹ Investment

₹ 6,55,000



Payback

0.70 years

Project Impacts



₹ 3, 80,000 of annual energy savings



59,988 scm/per year of annual fuel savings



161.53 tCO₂ GHG emission reduction per year

Cost Economics

NG Consumption (Baseline)	0.27 scm/kg
NG Consumption (Post Implementation)	0.23 scm/kg
Annual made-tea production	14,81,977 kg-made tea
NG Saving per Annum	59,988 scm/y
Annual Monetary Saving	Rs. 9,33,000
Investment	Rs 6, 55,000
Simple Payback	0.7 years

Replication Potential



The technology has significant replication potential in across all industrial process. In Jorhat Tea Cluster, the replication potential is expected in 20% of the units

i.e. around 44 units.

Calculation

Savings in terms of energy: Baseline fuel consumption (scm/y) – Post Implementation fuel consumption (scm / y).



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