



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 - 6

Installation of Energy Efficient Scroll Chiller (5 TR Air Cooled)

Objective:

Chiller is one of the key utilities in Chemical units. Chillers are used in the cluster for jacket cooling in the process. At present, most of the units in the cluster have reciprocating chillers or use ice based system for their cooling requirement. Reciprocating chillers have higher specific energy consumption compared to scroll / screw chillers.

Implementation:

The unit was using a 10 TR old reciprocating chiller. The project supported installation of a 5 TR energy efficient scroll chiller, thus helping the unit become energy efficient and cost competitive.

Principle:

A chiller is a machine that removes heat from a liquid via a vapor-compression or absorption refrigeration cycles. This liquid can then be circulated through a heat exchanger to cool equipment or product. As per process requirement, the chilled water is delivered at 5 to 7 degree Celsius. A scroll chiller system makes use of a scroll compressor which has a better efficiency compared to reciprocating compressors. A scroll compressor is a specially designed compressor that works in a circular motion, as opposed to up-and-down piston action.



Unit Profile

M/s **Sunshine Chemicals** is a chemical manufacturing company located at GIDC, Ankleshwar Gujarat. The unit is involved in the manufacturing and distribution of various ranges of mix solvents, industrial solvents and distill solvents.

Benefits



- ◆ Reduction in specific energy consumption by 30-35 %
- ◆ Maintenance cost reduction by 40-50%
- ◆ Reduction in breakdown by 30-40%
- ◆ Noise free operation
- ◆ Highly reliable



Before



After

Project Economic

₹ Savings

₹ 1,20,000/yr

₹ Cost of Equipment

₹ 1,64,000

Payback

1.8 Y (22 months)

Project Impacts



12,070 kWh/y of annual electricity saving



1 TOE of annual energy savings



10 tCO₂ GHG emission reduction per year

Cost Economics

Specific power consumption (Baseline)	1.6 kW/TR
Specific power consumption (Post Implementation)	1.05 kW/TR
Annual electricity saving	12,070 kWh/h
Annual Monetary saving	Rs 1,20,000
Cost of Equipment	Rs. 1,64,000
Payback	22 months

Replication Potential



The technology has significant replication potential in across all industrial process. In Ankleshwar chemical cluster, the replication potential is expected in 8 % of the units i.e. around 50 units.

Calculation

Energy Savings = Baseline Specific power consumption – Post Implementation Specific power consumption



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