

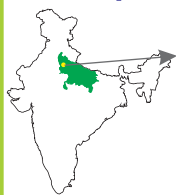
“Promoting Energy Efficiency and Renewable Energy in selected MSME clusters in India”

With an aim 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). The project supports MSME units in implementing various energy conservation measures and thus result in reduced energy consumption and Green House Gas (GHG).

A GEF-UNIDO-BEE Project

Reducing the Dead Weight of the Kiln Car Using Low Mass Kiln Furniture

Company Profile



Patna Ceramic located at GT Road, **Khurja, Uttar Pradesh** is one of the leading HT and LT insulator manufacturer in the Khurja ceramic cluster.

Objective



Improve the efficiency of tunnel kiln by reducing the dead weight of the kiln car with the help of improved low mass kiln furniture.

Intervention



Removed the existing insulating bricks in the bottom of the kiln car and filled the hollow space with **ultralite** (which is an improved insulated material with lowest specific heat compared to the insulating bricks) with a supporting block to give proper support and increase the strength of the kiln base.

Outcomes



- 10 to 13% fuel saved per cycle
- Almost 30% reduction in dead weight of the kiln car
- Easy maintenance
- Durability

Principle



- ❖ Low thermal mass materials, when used for kiln car construction, reduces the weight of the kiln car considerably.
- ❖ The weight reduction of the kiln cars in tunnel kilns provides significant amount of energy savings and also improve material to car weight ratio.

Implementation



- ❖ The weight of the existing kiln car was 1186 kg. Therefore the existing kiln car was reconstructed with the help of improved insulating materials such as ultralite and hollow bricks.
- ❖ The excess dead weight in the bottom of the old kiln car was removed and filled with ultralite insulating material with a supporting block to give proper support and increase the strength of the kiln base.
- ❖ Replacement of refractory bricks with the hollow ceramic coated pipes at the supporting pillars for holding the racks
- ❖ Use of ceramic fiber blankets at the base of the car instead of refractory brick base
- ❖ The weight of the newly built kiln car is 983 kg and it is 17% less than the old kiln car.



**Activity conceived and implemented
with technical help from project**



Cost-Economics

Operating hours per annum*	7488
Expected fuel savings per annum	10800 Liters
Cost of fuel	₹ 28/Liter
Expected monetary savings per annum	₹ 302400
Total investment for single kiln car	₹ 55000
Payback period	2 - 3 Months

* Assumption

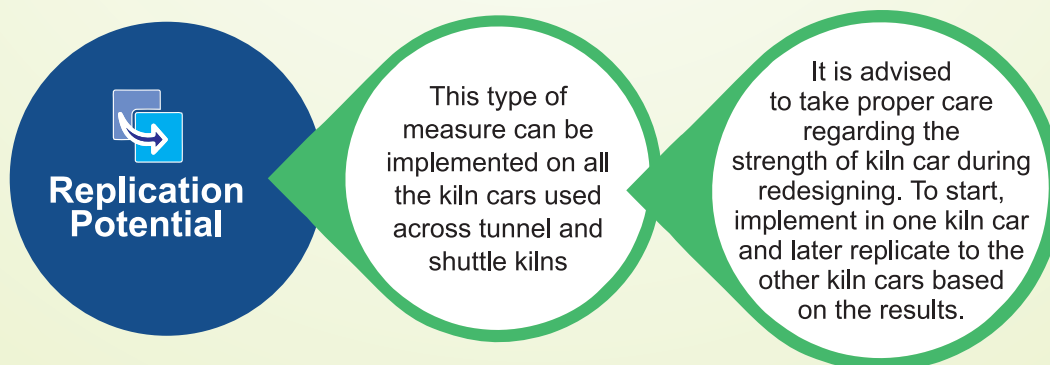
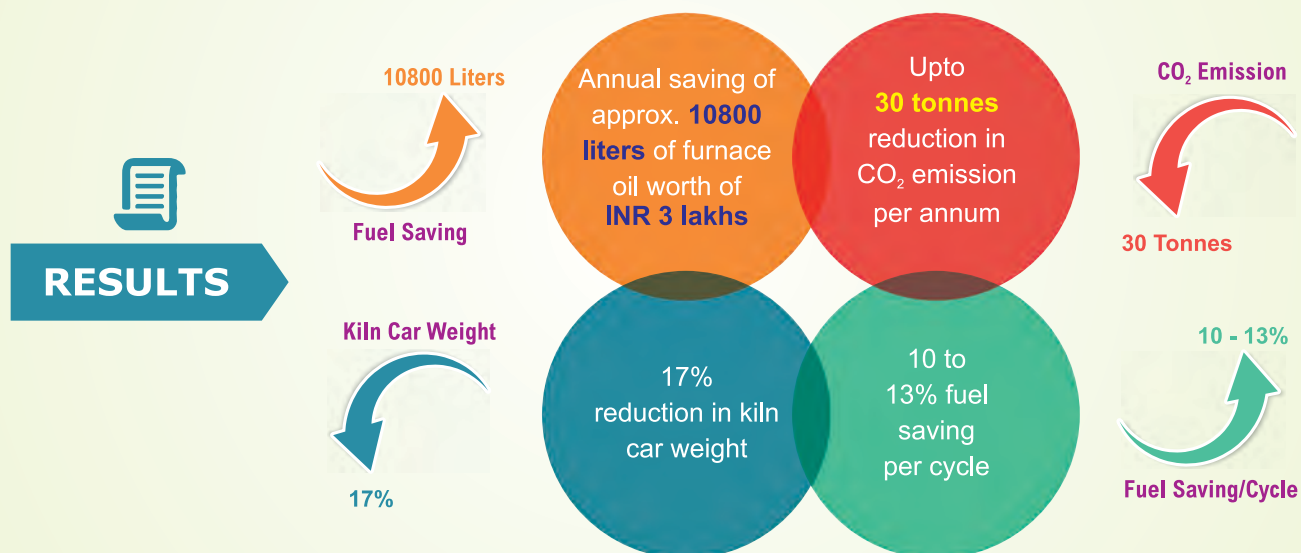
Old and New Kiln Car Structure



Old Structure



New Structure



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