



UTPRERAK उत्प्रेरक

A CENTRE OF EXCELLENCE TO ACCELERATE ADOPTION OF ENERGY EFFICIENT TECHNOLOGIES



BACKGROUND

Ministry of power has initiated several flagship programme to advance clean energy technologies in Indian economy. These initiatives would not only reduce the cost of energy to industry and other potential sectors but at the same time will contribute towards achieving India's climate commitment. In this endeavor Bureau of Energy Efficiency under the guidance of MOP has established **UTPRERAK - Unnat Takniki Pradarshan Kendra** to recognize the need for massive scale awareness and capacity building requirements on energy efficiency in the wake of Energy Conservation Act implementation process in the NCR region.

The demonstration centre shall serve to be a single window centre for display of non-working models on proven technologies identified under Perform, Achieve and Trade scheme of Bureau of Energy Efficiency. The centre also envisages providing key inputs for national energy policy information, links education and research for energy efficiency solutions, and develops innovative applied research solutions.

In the centre, Initially 5 Nos. of PAT sectors namely Cement, Iron & Steel, Paper, Textile and Chlor-Alkali has been identified for which the following technology models has been proposed.

AIM

The centre aims to promote Energy Conservation and sustainable development in India by improved access to modern Energy Efficiency services, Technologies and knowledge base” The Centre would implement and support projects and activities in the 5 result areas:

- As an institution to provide value added Training/ Capacity Building and Education in energy efficiency.
- As a showcase for Energy efficient technologies of key industry sector.
- As an Exhibition/Information center and knowledge repository.
- As a forum for conferences/continuing education/ Latest energy efficiency /fresh capacity building/Tailored policy and regulatory support frameworks.
- With future potential to establish collaboration with International Centres/Institutions on technology transfer.



OBJECTIVE

The centre is mandated to become the key reference and resource institution on industrial energy efficiency technologies in order to: -

- Foster adoption of applications and facilitate technology demonstration of Energy-Efficient industrial equipment by development, outreach and educational activities.
- Create/build institutional capacity to enhance business opportunities in manufacturing and use of energy efficient technologies.
- Establish key market connections by providing practitioners, eg. Energy Managers and Energy Auditors, an opportunity to explore and learn about state of the art energy efficient technologies.
- Coordinate outreach and support efforts, offering exhibits, demonstrations materials and technical inputs in the adoption of emerging technologies.
- Provide a forum for capacity building and continuing education on energy efficient technologies being practiced in India and abroad.



ECO-SYSTEM

The Centre's ecosystem includes Industry participation and besides show casing specific end-use technology and providing hands-on training, its activities shall include conducting awareness sessions, facilitating technology information sourcing, showcasing energy efficient technologies, promoting technology collaboration and transfer, and organizing information dissemination seminars.

When fully functional, the center will have state-of-art facilities for networking, conferencing, training, and information dissemination on energy efficient technologies.

The Centre is established as a strategic institution acting as a one stop solution provider as per requirements of the Energy professional across pan-India for capacity building and training with a proportion of 50% lab training and 50% classes covering concepts, case studies related to lab and industry. This centre will be further developed as research cum centre of excellence for energy transition and facilitating technology transfer.

This Centre will also function, under the guidance of BEE to undertake collaboration and technology transfer on advanced technologies with potential institutes across the world.



SECTOR-WISE ENERGY EFFICIENT TECHNOLOGIES

CEMENT SECTOR



ALTERNATE FUELS AND RAW MATERIALS RE-PROCESSING SYSTEM

In AFR processing system different types of alternate fuels like MSW, plastics, wood, textiles are shredded to less than 50 mm size for co-processing them into the kiln calciner.

Potential Savings

70 – 210 kg CO₂/tonne of cement (net reduction) for PSC.

The tentative cost of the project is 4000 Lakhs. Payback period is 3-4 years.

ALTERNATE FUELS AND RAW MATERIALS FEEDING ARRANGEMENT INTO KILN CALCINER (CO-PROCESSING)

The Alternative Fuel from pre-processing area is fed to the different hopper comprising MSW, Biomass, Rice-husk etc. From these hoppers, the Alternate fuel is then weighed through the weigh feeders & transferred to the belt conveyors for taking it to precalciner side.

Potential Savings

Energy saving is 0.32 GJ/ton of clinker (with 10% TSR). The tentative cost of the project is 3000 Lakhs. Payback period is 3-4 years.



WASTE HEAT RECOVERY FROM PRE-HEATER OUTLET

In a cement plant, nearly 35% heat is lost, primarily from the preheater and cooler waste gases. In the Waste Heat Recovery System, waste heat from the flue gas of Kiln and Cooler is utilized to generate power.

Potential Savings

The potential of power generation is 25 KWh/tonne to 45 KWh/tonne of clinker production. For a typical project, the cost is approximately Rs. 10 Crore per MW with a payback of roughly 4-5 years.

VERTICAL ROLLER MILL

Vertical Roller Mill (VRM) is used for grinding the raw materials, clinker and other additives in cement plant. VRM leads to higher throughput rates of more than 1400 tph

Potential Savings

Energy savings upto 40%. Payback period is 4 years.



IRON & STEEL SECTOR



WASTE HEAT RECOVERY IN SINTER PLANT

In a sinter plant, sensible heat can be recovered both from the exhaust gases of the sinter machine and the off-air of the sinter cooler

Potential Savings

Total Cost: Rs 207 Crore for 1MTPA capacity. Electrical Savings 22.1 kWh/t sinter and CO₂ reduction 23.86 kg-CO₂/t-sinter.

COKE DRY COOLING PLANT

CDQ is a system where hot coke is removed from coke ovens at a temperature of approximately 1,000°C & is cooled and kept dry with inert gas and the resulting steam produced in a waste heat recovery boiler is used to generate steam.

Potential Savings

Steam production for 1 MT of coke is 68 tph which can generate power of 13 MW. Payback period is 3-4 years



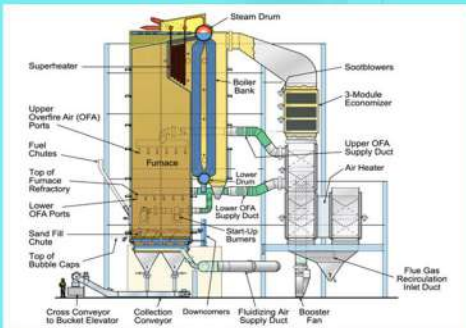
PULP & PAPER SECTOR

BUBBLING TO SPOUTED BED COMBUSTION CONVERSION FOR ENHANCED GENERATION IN AFBC BOILER

After the application of this technology, the boiler operates on full load on sustained basis maintaining bed temperature less than 900 degree Celsius with no appreciable change in superheater performance.

Potential Savings

Annual Energy saving of 24.5 million kWh and 10TPH steam. Payback period 11 months approx.

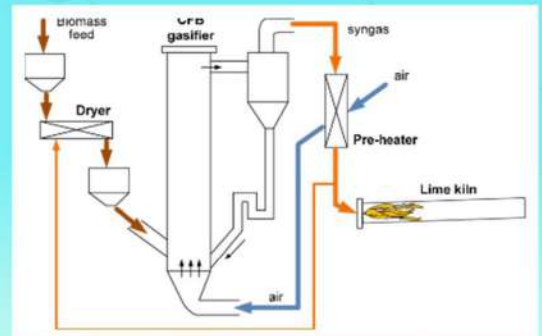


BIOGAS FIRING IN ROTARY KILN

In the lime kiln used for making calcinations of lime, the primary heat energy used is furnace oil which is partly replaced with Biogas obtained by means of treatment of foul condensate along with bagasse effluent biologically for generation of biogas.

Potential Savings

Replacement of LDO by biomass.



TEXTILE SECTOR



WASTE HEAT RECOVERY FROM CENTRIFUGAL AIR COMPRESSOR FOR HOT WATER GENERATION

The existing System comprises of battery of water-cooled screw compressors replacing with centrifugal compressor with waste heat recovery system for hot water generation.

Potential Savings

Fuel saving of 1050 MT annually. Electricity savings of 1.5 million units.

AIR-FLOW DYEING MACHINES

The Air Flow dyeing Machine uses low MLR ratio and uses jet of air for coloration of the fabric, which leads to saving in water consumption and less steam requirement for Dyeing of the Fabric compared to soft flow dyeing machine.

Potential Savings

Saving of 1085 Tonne of Coal and Electrical saving of 0.62 million units, water saving of 71400m³.

Investment: 55 Lakh

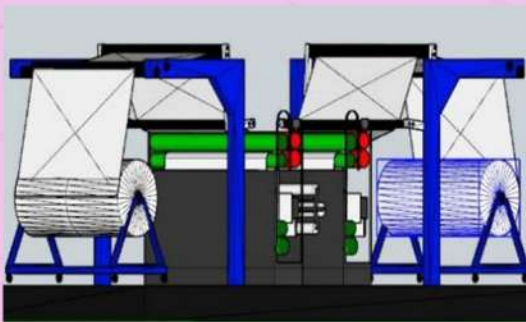


ULTRASONIC-ASSISTED WET PROCESSING

The use of ultrasound wet processing unit offers many potential advantages in textile industry including energy savings and reduced processing time

Potential Savings

It saves 60% steam, 30% water 30% electricity. Payback period is @ 1 year.



CHLOR-ALKALI SECTOR



MICRO-TURBINE

The unutilized pressure energy in the process plant PRV / PRDS, which is otherwise simply throttled, can be conserved by installation of a micro-turbine in the steam line to generate power/captive power. In the process, the micro turbine is installed parallel to the PRV and the exit line from the turbine is connected to the process line.

Potential Savings

Total Cost is Rs. 15 Lakh for 0.5 MW. Payback period less than a year.



BENEFITS TO ENERGY PROFESSIONAL

The centre shall be established as a strategic institution acting as a one stop solution provider as per requirements of the Energy professional across pan-India for capacity building and training with a proportion of 50% lab training and 50% classes covering concepts, case studies related to lab and industry. This centre will be further developed as research cum centre of excellence for energy transition and facilitating technology transfer.



The Centre is expected to provide intensive training to **more than 10,000 Energy Professionals** from industry & other potential sectors over next 5 years.

WAY FORWARD

- Apart from training, shall also operate as a Regional hub for conducting Research and Development activities for clean energy technologies in energy intensive sectors such as Cement, Iron & Steel, Pulp & Paper, Textile & Chlor-Alkali (other energy intensive sectors will be included subsequently) where MoU would be signed between BEE and various research institutions such as IIT, NCCBM, CPPRI, NISST, JNARRDC, SITRA, and NITRA etc., for carrying out the research based activities in the centre and could be demonstrated in plants after successful completion of R&D projects.
- The emerging technologies such as Hydrogen, CCUS, Solar Thermal can also be developed for the decarbonization of above sectors.
- This Centre will also function, under the guidance of BEE to undertake collaboration and technology transfer on advanced technologies with potential institutes across the world.
- The Centre shall also be the facility for knowledge exchange platform where best available practices across the sectors could be disseminated to the Designated Consumers through workshops/seminars.





Bureau of Energy Efficiency

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