

## **ACC Chanda Cement Works - A Profile**

ACC pioneered the Cement Industry in Maharashtra by setting up the State's first cement plant, the Chanda Cement Works, in 1969. The Works is located in the Vidarbha region of Maharashtra near Chandrapur at a distance of 150 kms to the south of Nagpur. It has two production lines whose initial total capacity of 0.4 million tonnes was progressively raised by introducing precalciner technology (in 1980) and by other improvements (in 1987) to 0.62 million tonnes per annum. In the year 2000, by introducing six stages preheater and a new calciner, modernization and expansion of this plant has been successfully carried out with in house engineering skills. This has helped to increase the cement production capacity @ 1.0 million tonnes per annum with reduction in the total dust load to the atmosphere.

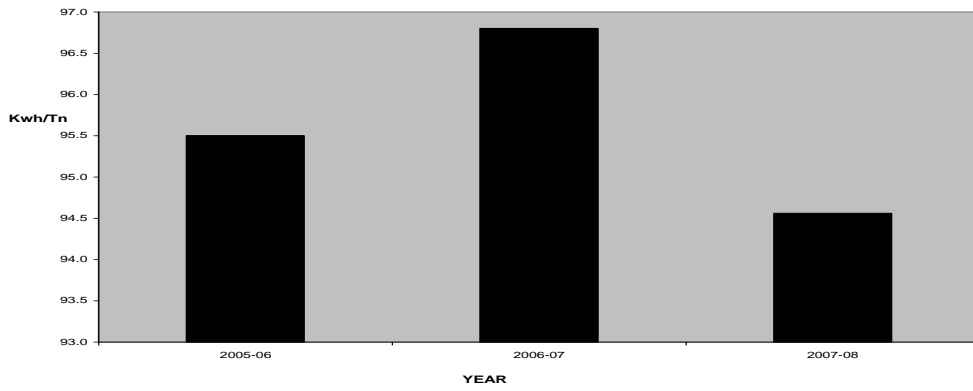
In spite of the proximity of the Works to coal mines and consequent lower cost of coal, the variable cost of production is high. The works therefore opted for and installed Captive power plant as one of its major step.

Before the installation of Power plant electricity requirement of ACC Chanda Cement Works was 18 MVA, which was met by drawing electricity from Maharashtra State Electricity Board (MSEB) through contract demand of 18 MVA.

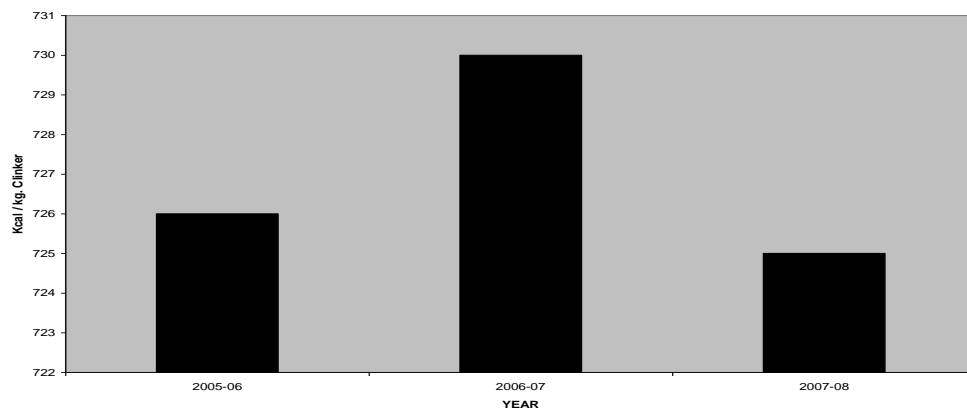
Looking at the increasing market demand and to maintain its sustainability in the region, the Chanda Cement Work is now coming up with a new state-of-art cement manufacturing unit of 3.18 MTPA capacity which will start production in early 2011. To make it self reliant in energy front, it is adding another 25 MW to the existing 15 MW captive power plant. The foundation stone of the Chanda expansion and modernization project was inaugurated by our Managing Director Mr. Sumit Banerjee on 1<sup>st</sup> May 2008. With induction of world-class technology coupled with best environmental practices, this expansion and modernization project will definitely emerge as one of the zero polluting industries in India.

Limestone mining area of Chanda Cement Works is located at about 9 km towards SW direction. Total lease area of Sindola Mine is 840.83 Hectares. Crushers are installed in this mine for limestone crushing. Another Gowari Mine has 772.74 Hectares of land on lease just 2 km from Sindola mine with a left turn just from the vicinity of the plant. Another major river is Painganga which confluences with the Wardha River near village Wadha about 4.3 km from ACC Chanda Cement Works towards SE direction. In addition, there is a local river i.e. Nirguda River which meets Wardha River adjacent to the existing plant at about 0.75 km towards south direction.

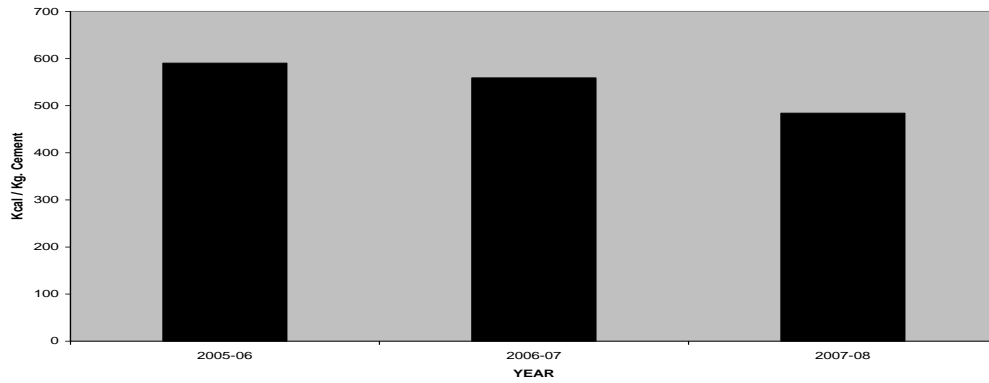
**Kwh / Tn. Cement**



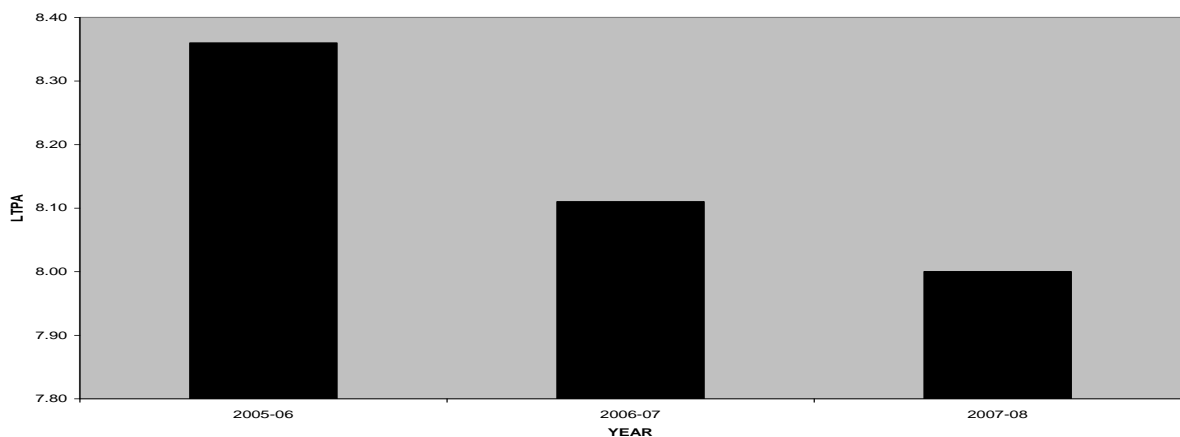
**Kcal / kg. Clinker**



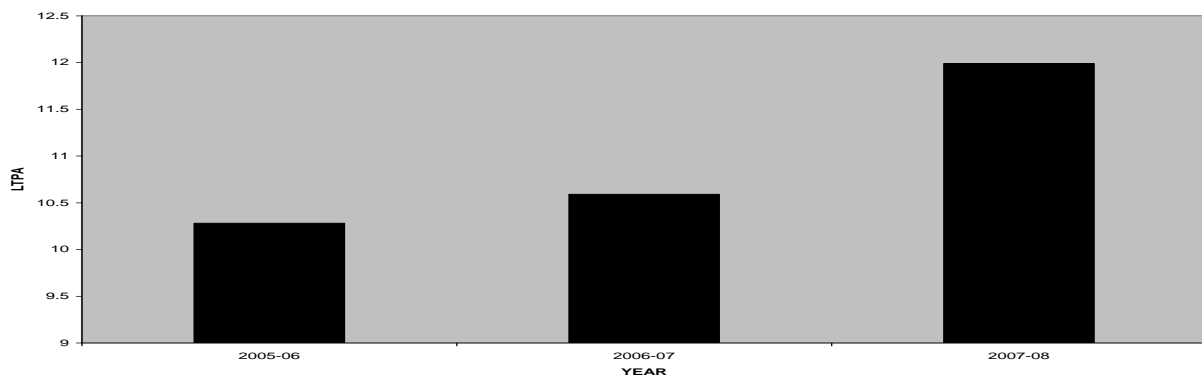
**Kcal/Kg. Cement**



#### CLINKER PRODUCTION



#### CEMENT PRODUCTION



### **ENERGY CONSERVATION COMMITMENT, POLICY & SET UP**

Keeping in view of continuous depletion of natural resources CCW is putting effort in continual basis to conserve energy with sustainable developments so as to contribute in a better way for the future requirements of the nation.

The Energy management activities are done on daily basis. The power consumption of each department is communicated to the Head of depts. well before the daily meeting so as to communicate the same to down the line for actions to be taken. The energy management policy yet to be committed.

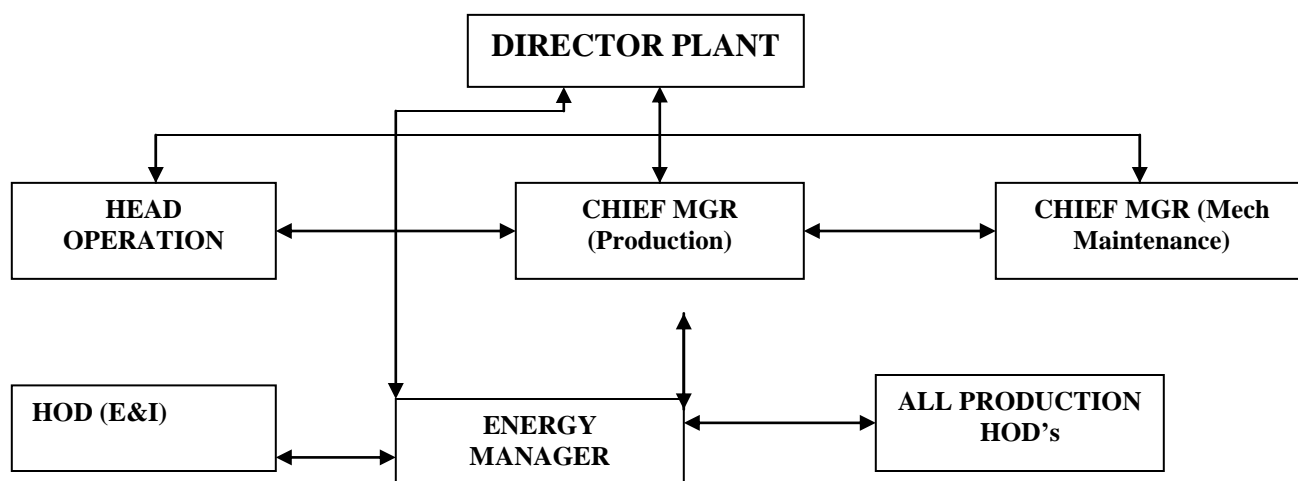
The energy Management Cell is:

Chairman: Director Plant

Members: Head Operation), Chief MGR (Production), Chief MGR (Mech Maint.), All HOD (Production & E & I) and Energy Manager (Coordinator)

The functions involved are: Energy monitoring & analysis, auditing & review of proposals, implementation and evaluation of implemented proposals. After proper estimation of the proposals, the details are put in budget for sanction along with payback period. The energy consumption target for different departments are set and reviewed periodically for any chances to improve further.

## Energy Conservation Cell:



### **DETAILS OF CONSCIOUS CONTINUAL EFFORTS AND MEASURES ON PROCESS CHANGE.**

#### **Reduction in water consumption:**

After modernization the kiln exit gas temperature has reduced from 396 deg.C to 300 deg.C. Hence cooling water requirement at the gas conditioning tower for cooling exit gases has reduced.

For conserving water we have implemented various schemes. Water consumption has not increased even after enhancing our production capacity from 6.0 Lakhs MT/annum to 10.00 Lakhs MT/annum. The entire cooling water is being re-circulated.

#### **Reduction in coal consumption:**

Heat energy requirement in kilns has been reduced continually from 890 Kcal/Kg clinker to 725 Kcal/kg clinker. Hence coal consumption has reduced from 25.5. % to the range of 21.4 %.

#### **Reduction in raw material consumption & conservation of natural minerals:**

We have successfully modified our raw mix design for using fly ash as substitute for Bauxite. This modification has resulted in reducing the use of Bauxite.

#### **Innovation & Facility provided for reuse of waste products:**

Huge quantity of fly ash is generated from the thermal power plants in our country, which is a waste material and a lot of amount is spent for handling and disposing the same. Large land area is wasted by way of land filling the disposed fly ash. ACC through in-house Research & consultancy studied the suitability of fly ash and developed best quality blended cement after carrying out various laboratory tests at our Research Centre Laboratory.

ACC Chanda is the first plant in the State of Maharashtra to manufacture Portland Pozzolona Cement (PPC) using fly ash by investing huge amount for fly ash extraction system at the Chandrapur Super Thermal Power Station (CSTPS) Chandrapur and transportation of fly ash to cement plant through specially made bulkers to avoid any fugitive emission during transport.

A fly ash handling system has also been constructed at the cement plant to enable storing and feeding of fly ash to cement mills.

We have also purchased 10 bulkers for transportation of fly ash from CSTPS and Nagpur Khaperkeda Thermal Power Station which is about 215 Kms away thereby helping them in evacuating the dust nuisance at the Power Stations and utilizing the national waste for production purposes.

Similarly ACC Chanda Works is utilizing waste products such as coal fines and iron/mill scale from steel industry and Phospho Gypsum from fertilizer plants.

#### **Steps for reuse/recycle of waste:**

A new fly ash storage silo is being constructed for re-use of fly ash generated at our Captive Power Plant and being used for cement manufacturing resulting into conservation of natural resources i.e. Bauxite.

#### **DETAILS REGARDING EFFLUENT TREATMENT PLANT AIR & WATER POLLUTION CONTROLS SYSTEMS.**

##### **Domestic effluent:**

A new Sewage treatment plant has been installed outside the plant with a treatment capacity of 450 m<sup>3</sup>/day and all the domestic effluent from the residential colony is diverted to this plant for treatment. The treated water is used for fruit garden and plantation along the road to near by Ghugus village, also along the road to Chandrapur. The Capital expenditure on STP Plant is Rs 40.00 lakhs.

Domestic effluent from the various buildings/sheds within the factory and Power plant area is conveyed through separate drains to septic tanks from there it is disposed in soil through soak pits.

#### **INDUSTRIAL EFFLUENT:**

##### **a) Cement Plant:**

Industrial water consumption is mainly for the cooling of kiln exhaust gas discharged through Pre heater at 330°C to gas conditioning tower before they are vented out through ESP below 150°C and for the cooling of machinery such as Compressors, Blowers, mill Bearings etc. Major quantity of total water is required in gas conditioning tower which ultimately gets evaporated out.

The water in use for cooling of machinery is re-circulated. Re-circulation tank and pumps are provided with a cooling tower to re-utilise the entire quantity of cooling water in circulation for cooling of machineries and for plantation and gardening purposes.

There is no generation of industrial effluent and water is not discharged outside the plant.

##### **b) Captive power plant:**

#### **Effluent Treatment Details:**

Industrial effluent generation of the co-generation power plant is non-hazardous and physico-chemical treatment of effluent is sufficient to meet the MPCB norms. The effluent from the various sources is discussed below :

##### **Steam Generator Blow-down:**

The salient characteristics of the blow-down water from the point of view of pollution are the pH and temperature of water since suspended solids are

negligible. The pH is in the range of 8.5 to 9.5 and the temperature of blow-down water is around 100°C.

The steam generator blow-down is cooled down in blow-down tank and overflow is taken to holding tank. The quantity of blow-down water is approximately 60.0 m<sup>3</sup>/day. Steam generator blow down water is used for gardening , green belt development and water sprinkling of roads in power plant itself.

**Effluent from Cooling Tower Blow-down:**

Cooling tower blow-down is clear water, which meets MPCB norms without treatment. Total quantity of cooling tower blow-down is 180.0 KL/day and the same is pumped to gas conditioning tower of the cement plant.

**Effluent from Ash Handling System:**

The bed ash from the steam generators is conveyed by pneumatic conveying system to the bed ash silo. Similarly the fly ash is conveyed to fly ash silo by pneumatic system.

Separate ash coolers are provided for cooling bed ash with air .The hot gas is recycled into the system. Therefore cooling tower blow-down effluent is not used for quenching the bed ash. Hence no effluent generation from Ash handling system.

**Effluent from Water Treatment Plant:**

The effluent from the generation of the cationic resin units in the water treatment plant is generally acidic in nature and that from the anionic resin units is alkaline in nature. The wastewater from the water treatment plant is neutralised in a neutralising pit. The neutralised effluent has suspended solids less than 100 ppm and pH is in the range of 7.5 to 8.0. The neutralised effluent is discharged to the ETP collection/holding tank.

Similarly drains from filtration plant and softening plant is discharged into ETP collection/holding tank. Total quantity of effluent generation from this source will be 96.0 KL/day.

Hence total quantity of effluent generation is 336.0 KL/day. Neutralization and primary treatment units are provided . Treated effluent meets the MPCB norms. From collection & holding tank the treated water is pumped to gas conditioning tower in cement plant for cooling the kiln exhaust gases.

**Fugitive Emissions:**

In the raw mill section, the fugitive emission points are the various transfer points of the conveying belts. These emissions are arrested effectively with the help of three dust collectors. In addition to this two dust collectors are also provided to arrest the dust emissions due to the blending and storage silo venting.

At cement mill section, total 8 dust collectors are in operation for controlling the dust emission from all the transfer points of material conveying equipments. Two dust collectors are provided to arrest the dust generated due to the venting of cement storage silos.

In the coal handling section, the fugitive emissions from the coal crusher and the transfer points of the conveying belts are arrested with the aid of four dust collectors of bag filter type.

At ropeway unloading station, coal gantry and coal handling section, the fugitive emission is controlled with the help of water spraying arrangements. In the Captive Power Plant 6 dust collectors are provided for the coal belt conveyor transfer points.

The fugitive emissions from the packing house is controlled by four dust collectors of bag filter type.

Besides this we have also installed dust collectors for DPC clinker discharge at gantry for arresting the fugitive emissions.

### Solid and Hazardous Wastes.

There is no generation of hazardous waste. However the bio medical waste generated from the factory and Mines dispensary, like used bandages, cotton etc. are incinerated by dumping it into (burning) running kilns. One personal is trained in handling and disposing this waste.

All the dust collected from ESPs and bag filters are taken back into the process the process as these are the part of product.

The lubrication oils used for various machineries are replaced after certain period. This used oil is collected and stored in earmarked area before sale. This oil is disposed off to vendors at Nagpur and Chandrapur who are authorized by the CPCB. As this oil comes under category no. 10 of Hazardous Waste (M&H) rules, 1989, all necessary precautions for collection, storage and disposal are taken out.

## **Details of efforts taken by the company towards environment preservation:**

### **Afforestation and Greening the Environment**

Tree plantation is a regular and committed activity at ACC. Vacant land in plant, mines and colony is used to develop greenery of various species. Endemic tree species like Shewan, Sheshu, Sheesham, Neelgiri, Cashia, Karanj. Neem, Rantree, Gulmohar, Ashoka, Palas, Hiwar Dhaora, Khair etc. have been raised to maintain the local ecology. Rocky areas in mines have been rendered suitable for plantation by over-spreading topsoil obtained from mining activity. Apart from this lush green grass with ornamental plants used for gardening to improve the aesthetic beauty and increase the joy of camping. A diversified fruit garden with more than 700 plant species has been developed near STP by reuse of treated waste water from sewage treatment plant. At present we have more than 4.3 lakh living species including 2 lakh Jatropha and 75,000 Castor oil seed plant covering 35 % of the total area. Tree plantation and green belt development programmes have been extended to cover areas in the vicinity of our plants for the benefit of the local community.

Plantation of trees is a main activity in all our public functions such as Independence Day, Republic Day, May Day, World Environment Day etc. involving the employees and their families.

**Improvement in house-keeping to make it environment-friendly.**

We have purchased manually operated Road Sweepers for cleaning of the roads in the plant.

For controlling fugitive emission due to vehicular movement automatic water sprinkler system has been provided on all the roads inside the plant which runs on auto mode as per the frequency fixed through DCS panels in Central Control Room.

Initiation of TPM activities in our plant has notable contribution to improvement in productivity, safety and working environment. Improvements in safety and working environment largely contributed through the projects undertaken by employees under Quality Circle and Small Group Activity has also helped in good house keeping.

Environment-friendly inputs like Fly ash from our own and near-by CTPS, coal fines & iron/mill scale from steel industry, and phospho gypsum from fertilizer and chemical plants is being used for the manufacture of cement.

ACC Chanda cement works has put up a fly ash extraction collection and transportation and feeding system with a capital investment of RS.7.00 Crores

In place of open trucks, Bulklers are used for transportation of fly ash in order to avoid dust emission while transportation from Thermal power station Chandrapur and Khaper Kheda, Nagpur and from NTPC, Ramagundam, (A.P)

**Development & production of eco-friendly products:**

Eco-friendly Portland Pozzolana cement is manufactured by using fly ash from Thermal power plants.

Chanda cement works has spelled out its safety policy and made it under stand to all employees of the plant. Safety audits are conducted every year by an out side agency like National Safety Council of India and Loss Prevention Association of India.

We are complying with all the norms of Water and Air Acts .Hence no penalties & no legal actions initiated against Chanda Cement Works by the Pollution Control Board. All the pollution control equipments are tuned to operate with efficiency, therefore emission of Suspended Particulate Matter (SPM), SO2 and NO2 are always controlled to be less than the MPCB norms. No waste material is dumped out side the plant. Bio medical waste is burned in our kilns.

**Environmental & safety management system available for:**

**1. On-site hazards:**

At Chanda cement works the on site safety hazards are coal catching fire in open yards and in fine coal hopper, fire hazard in coal mill dust filters.

For extinguishing fire in fine coal hopper of possible fire, we have provided auto CO2 purging system.

For coal mill dust collector safety we have replaced the Polyester fabric bags needle felt with Co-Polymer-Antistatic bags apart from providing CO2 purging system.

When ever there is fire in the fine coal hopper or coal dust collector, the CO2 purging system will come in to action and making the presence of oxygen NIL in the fine coal hoppers or dust collector bags compartment ,which ever the case may be, there by starving the fire.

The mill will automatically trip due to the detector sensing the higher temperature and sending signal to control panel for the purging of CO2. in case of the fire in the coal heaps is extinguished by operating the Water sprinkler / by ring main hydrant system provided covering the whole plant area.

## **II. Off-site hazards:**

As such, off site hazards are minimal but the fly ash generated at Chandrapur Thermal power station and Nagpur, Khaper Kheda is carried in bulker trucks by road, with out polluting the atmosphere and pumped in to fly ash silos in the plant, thereby reducing both the thermal power plants fly ash handling problem as well as their environmental problem.

We are in regular contact with local fire brigade authorities and local Govt. authorities to meet any likely off site hazards.

The trucks which are transporting coal and other raw materials are properly covered with tarpaulin to prevent pollution problem enroot.

## **Facilities for treatment/disposal of:**

### **1. Effluents:**

Inside the plant, the effluents are discharged to individual soak pits. Domestic effluents from our colony are treated in Sewage treatment plant and the treated water is used for gardening and plantation purposes in the colony and road side plantation.

### **2. Emissions:**

Stack emissions are monitored continuously by a competent agency with our Environment Engineers and the emissions are within limits (i.e.), within MPCB norms.

### **3. Waste:**

No solid waste is generated in the plant.

No hazardous waste generated in the plant.

The waste oil generated/removed from machinery such as compressors, mill bearings etc is collected in drums and sold to market vendors approved by the Pollution Control Board.

New fly ash silo initiated by Chanda cement works for collecting the fly ash to avoid fly ash rising due to wind when unloaded in to the material gantry. For dust collectors new PTFE bags are adopted (in place of conventional type needle felt polyester bags) which are very high in cost but more effective in controlling the dust emission