

# Binani Cement Limited

## Unit Profile

Binani Cement was launched under the brand name "BINANI" in the year 1997. In the beginning the capacity of kiln was 4750 TPD and with in-house effort of plant personnel, the clinker production was raised to 6000 TPD in the year 2004-05. We have our own Captive Thermal Power Plant and 85% of the total power requirement is met from it. In the financial year 2005-06, total 2.31 million tons cement was produced with a capacity utilization of 102.8%.

Binani Cement has adopted the most modern and latest dry-process pre-calcination technology with sophisticated control instruments ensuring uniform and top quality cement. We have also attached utmost importance to the conservation of environment in and around our unit by installing efficient dust collection equipment in consonance with the international standards.

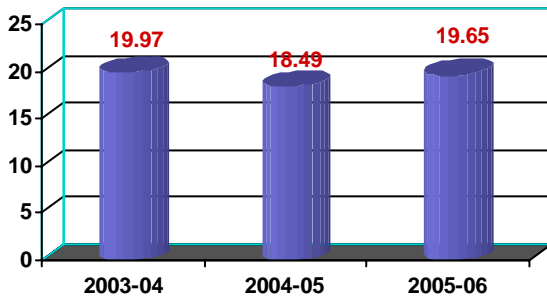


*An Overview of Binani Cement Limited*

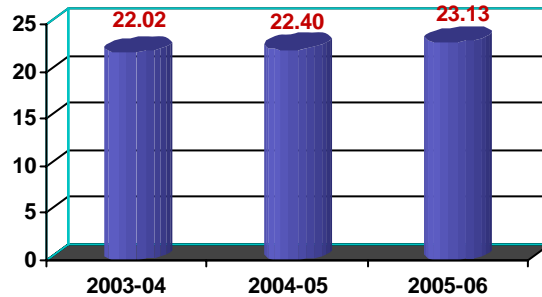
The plant produces three types of cement viz. OPC-43 grade, OPC-53 grade & Portland Pozzolona Cement. Company's product has the premium image in the market due to its superior quality. The annual turn over of our company is Rs. 58403.47 Lacs for the year 2005-06. The Herculean task of selling the

high quality cement at a competitive price put the BCL at their toes to control the cost right from day one.

## *Clinker Production*



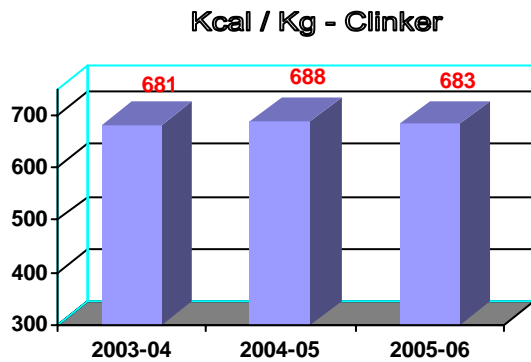
## *Cement Production*



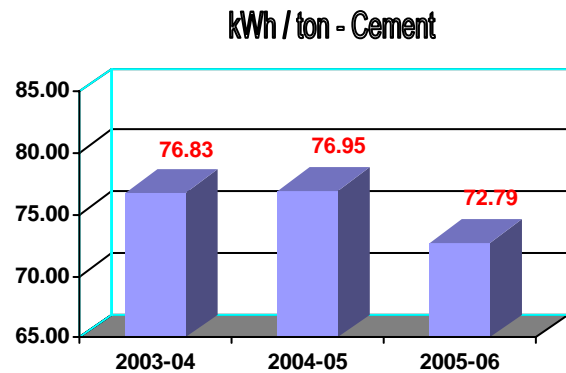
## Energy Consumption

In times of increasing cost and decreasing cement prices, optimization of plant operation plays a major role. All the employees of Binani Cement are very energy conscious and they do not leave any stone unturned to reduce the electrical as well as thermal energy consumption. Our Management provides free hand, full cooperation and moral support in this regard and everyone is being motivated to do so. Our percentage of energy cost comes out to 45.25 % of the total cost of cement production in the year 2005-06. The electrical & thermal energy consumption figures of last three years are shown below: -

## Thermal Energy Consumption



## Electrical Energy Consumption



### Energy Conservation Commitment, Policy & Organizational Setup

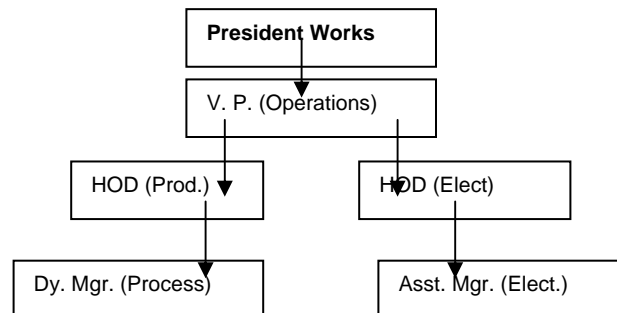
Energy conservation receives top priority at Binani Cement. In view of fast depleting natural resources of energy and galloping prices of energy, the commitment of the management towards energy conservation measures is high. As we are an ISO-9001, ISO-14001 & OHSAS-18001 certified company, we have well defined "Energy Policy" in which due emphasis is given to adopt latest energy conservation technology to enhance energy efficiency.

For the whole plant, Seven Sectional teams are formed from Mines Dept. to Packing Plant including Power Plant also. These groups have been given free hand working to identify problems, reason of break-down in their sections and coming forward with techno-economic feasible solutions and implementing them in a scheduled time frame.

### Energy Policy

1. Continuously monitor and benchmark our performance against best national and international energy consumption levels.
2. Comply with all regulatory and other requirements with respect to energy conservation.
3. Carry out regular energy audit to identify areas of improvement.
4. Adopt energy conservation technology to enhance energy efficiency.
5. Attempt to minimize the wastage of energy.
6. Maximize use of renewable sources.
7. Promote awareness amongst all employees on the need for energy conservation.

### Energy Conservation Cell Structure





## Energy Conservation Achievements

Specific Electrical Energy Consumption of the plant in the year 2003-04 was 76.83 kWh/ton of cement and it was reduced up to 72.79 kWh/ton of cement in the year 2005-06. Hence, specific electrical energy consumption lowered by 5.26%.

In order to achieve the best energy level, Brain Storming Sessions are conducted for getting innovative ideas. Hence, the different ideas are nurtured and motivated and the resultant benefits are fruitful modification.

Few of such modification are enlisted below:-

1. Membrane bags installed in six modules of Bag house to improve Bag hose performance.
2. Full -fledge alternative fuel feeding system installed for sustained usage of alternative fuels.
3. Riser's duct and gas inlet section of C-2 & K-2 cyclone enlarged.
4. 25 mm refractory thickness reduced in vertical portion of C-1 cyclone.
5. Optimization packages installed in Raw Mill, Kiln & Cement Mills
6. Conventional lamella seal replaced with ITICA make graphite seal to improve the overall thermal efficiency.
7. Bag house fan suction chamber and inlet Y-piece modified.

## Energy Conservation Plans & Targets

Our new benchmark for electrical energy consumption is 72.00 kWh/ton of cement and for thermal energy consumption is 675 Kcal/kg clinker. The following energy conservation related projects have been identified for implementation in the plant.

- Installation of material divertor and Y chute between 311BC2 and 311BC4 in Raw Mill section
- Modifications / improvements in C5 cyclone geometry in the Preheater Tower.
- Replacement of glass fibre bags with membrane bags in remaining six modules of Bag house
- Replacing suction duct of cooler fans
- Replacement of conventional chokes with e-choke for tube lights
- Replacing coal mill booster fan with suitable quantity fan
- Application of soft starters for under loaded motors
- Replace the existing heat less (purging) type of dryer with external heater type of dryer of lower capacity

## Environment and Safety

Utmost priority is always given on Industrial safety, occupational health and environment protection in our unit. We have an effective Environment Management system conforming to ISO 14001:1996 and Occupational Health & Safety Management System conforming to OHSAS: 18001.

### Environment

As of our prime concern, the technology and equipment selection was so keeping environmental consideration as topmost priority. The various environmental aspects/ impacts were considered/envisaged and accordingly mitigatory measures were adopted. Following are the few measures taken for environmental protection: -

- All the major venting points are provided with pollution control equipment like Bag House (L.S. Crusher, Raw Mill/Kiln Section) and 4 Nos. of Electro Static Precipitator ESP (Coal Mill, Clinker Cooler, and Cement Mills). The air is emitted out through a stack, the stacks are regularly monitored for its emission of Particulate Matter and found to be in the range of 25-40 mg/Nm<sup>3</sup> which is less than the prescribed norms of 150 mg/N-m<sup>3</sup>.
- All the transfer points are provided with Jet Pulse Filter (JPF) so that no emission occurs during transportation of material.
- Dust suppression system has been installed at Coal & Limestone unloading points.
- Plant roads & approach roads are made up of bitumen/concrete.
- Provision of water sprinkling on the belt carrying raw material is made.
- Dust suppression with water sprinkling on the haul roads reduces the fugitive emissions.

- We maintain a status of “Zero Discharge unit”. The cement plant consumes water in cooling the machines & for temperature control in process, hence no waste water gets generated which is to be disposed off.
- Our Domestic Waste-water is treated in a Sewage Treatment Plant and then reused for Plantation.
- The operators of HEMM are provided with Air Conditioned cabin to prevent them from dust exposure and for improved efficiency.
- The noise making machines like Compressors, Blower etc are provided with an enclosure.
- A cemented by-pass road connecting plant to National highway has been laid down.
- Regular monitoring of noise levels and initiation of corrective action if any for increased noise levels.

## **Safety**

We have defined our own On-Site Emergency plan for handling any type of emergency/eventuality. For handling emergencies & its speedy execution, we have made a Central Safety Committee. The safety committee makes aware the plant personnel about the hazards involved in their tasks through training, developing procedures, investigation of accidents, maintaining statistics, active participation & organizing safety meetings.

Our company is always one step ahead in taking care of employees' health/ safety and their well being. We have gone for OHSAS 18001 (Occupational Health & Assessment Series) just because to provide safe working place / environment to every employees. We have identified all unsafe areas and where there is a chance of exposure to hazard, accident and incident. Regularly our sectional teams are taking rounds and further identifying the unsafe working place and person, and reviewing the same in OHS cell meeting. We are having our well-equipped, diagnostic and health center with qualified doctor and para-medical staff in our residential area round the clock employees and the villagers can get free medical aid.

## **Project –I**

**Background:** In order to clean the dust-laden gas coming out of Raw mill and Kiln system, a reverse air bag house containing 12 modules has been installed. The conventional Glass Fibre bags have been replaced with PTFE membrane bags as the pressure drop across bag house increased.

**Observations Made:** The operation of the plant was started in the year 1997. After some time the pores of bags gets choked with dust particles resulting increase in pressure drop across bag house. Before modification bag house fan load was running on higher side due to higher-pressure drop across bag house i.e. equivalent to 120 mmwg.

**Financial Analysis and Impact of Implementation:** After replacement of bags in six modules pressure drop across bag house has reduced by 30 mmwg and electrical energy saved to the tune of 75 kWh. Total investment incurred in this project was 170.57 Lacs and net benefit was 26.9 Lacs.

## **Project-II**

**Background:** In the kiln section, 6-stage preheater with separate line calciner is installed to recuperate the heat energy of kiln for preheating the powdered material, which is entering inside the kiln. The total pressure drop across Calciner string is on higher side i.e. around 880 mmwg, as the pressure drop across individual cyclone is also on higher side. Therefore in order to reduce the total pressure drop across preheater all the cyclones have to be modified one by one in a phased manner.

**Observations Made:** The pressure drop across C-2 cyclone of calciner string was on higher side i.e. 130 mmwg. After thorough measurement, it was decided to increase the inlet cross section area of cyclone in order to reduce the pressure drop across it. After modification pressure drop reduced up to 120 mmwg.

**Financial Analysis and Impact of Implementation:** After modification the pressure drop across C-2 cyclone reduced to the tune of 10 mmwg and 20 kWh electrical energy saved.

## **Project-III**

### **Alternate Fuel Feeding System for SLC-Kiln**

#### **Background**

The cement plant located at Binanigram, has one SLC Kiln with 6-stage preheater having operating capacity of 6000 TPD. The present system was designed to use bituminous coal only and not capable to use alternate fuel such as agro waste etc. Since the cost of coal is escalating day by day, therefore a new system has been developed to use alternate fuel in the present available system. The usage of alternate fuel conserves the non-renewable fuel i.e. coal. The monetary saving with this new system depends upon the extent of availability of alternate fuel and cost of alternate fuel in comparison to coal.

#### **Observations Made**

The system is designed for feeding alternate fuel in the Calciner Vessel. The waste derived fuel is being fed from the existing coal yard to coal mill house building through belt conveyors. Thereafter the fuel is diverted through a three-way gate from inclined belt to the belt conveyor feeding to storage hopper having a capacity of 130 MT. At the bottom of hopper, an agitator, needle gate and weigh feeders are provided for proper extraction and metering of fuel.

The discharge of the material after the weigh feeder is transported through a belt conveyor crossing over the road up to preheater building. From here the alternate fuel is discharged into Calciner bottom duct through a specially designed chute. A double flap valve and a shut off gate

are installed in the chute for proper air sealing and for safety of operation. The valves are designed in such a way that the quantity of alternate fuels fed into the Calciner is as homogeneous as possible in order to avoid temperature and CO peaks which could influence the operation behavior of the system. After installation of this new system, the feeding of all types of alternate fuel having different sizes has been possible. The consumption of alternative fuel is approx. 20% of the total fuel consumption.

**Financial Analysis and Impact of Implementation:**

The total expenditure incurred on this project was Rs. 140.0 Lacs and the net monetary saving was Rs. 561.0 Lacs per annum with use of 20% alternate fuel. In addition to the said benefit, the use of alternate fuel will also save the non-renewable fuel i.e. coal to the tune of 16193 MT per annum.