

CENTURY CEMENT : BAIKUNTH

Introduction

It was around 1969 , that the Management of M/s Century Textiles & Industries Ltd., a flagship company of B.K.Birla Group of Companies, thought of diversifying their activities towards other areas and decided to establish a Cement plant 8 Km from Tilda. Subsequently, the place where the present Plant and the colony came into existence was christened as "Baikunth". The name "Baikunth" was evolved out of the two/three letters of the three adjacent village in sequence i.e. "Ba" of Bahesar, "Kun" of Kundru and "Th" of Tandwa. Baikunth is about 34 KM east of Raipur on Mumbai – Nagpur – Howrah SEC.Railway main line.

The 1st Kiln of the Plant was lighted up in December'1974 and the 2nd Kiln in May'1975. The first bag of Ordinary Portland Cement rolled out of the Plant and dispatched on 3rd March 1975. The present plant capacity is 18.00 Lakh MT per annum.



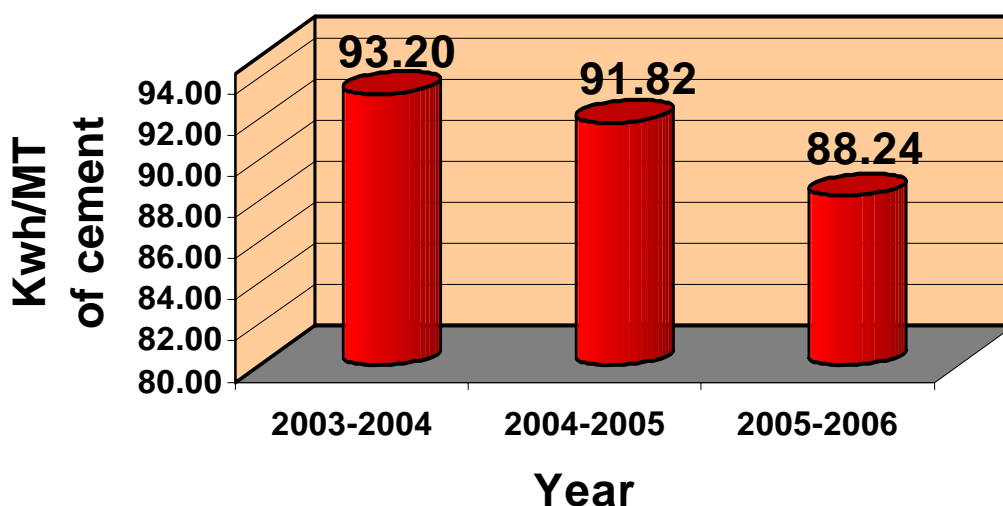
A view of the Plant

Energy Consumption

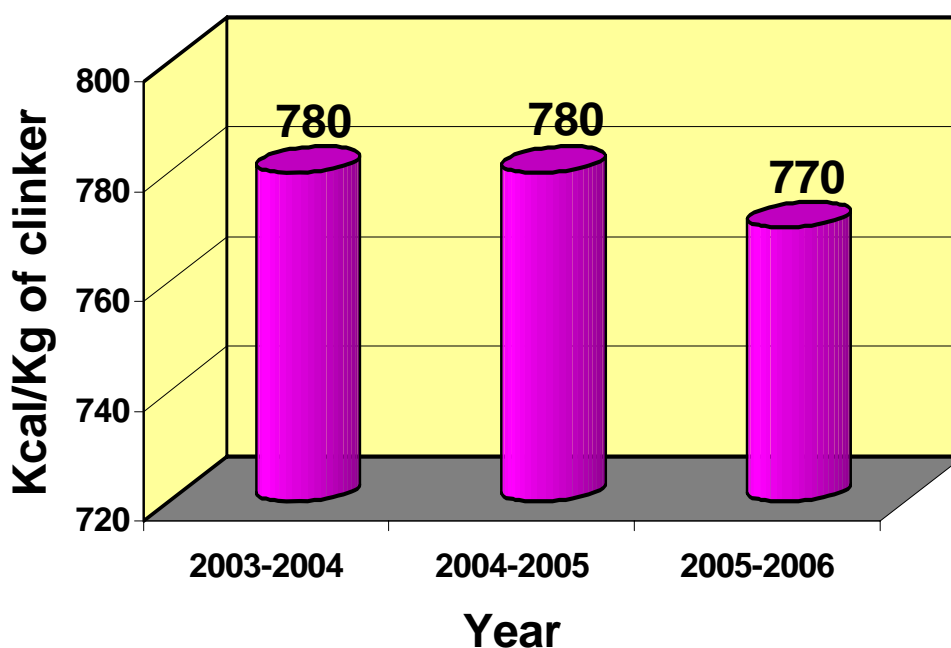
Cement manufacturing is an energy intensive industry. About 50% of the total production cost is that of energy (electrical & fuel). Therefore we are always trying to reduce the specific energy consumption. Total electrical energy, thermal energy consumed and specific electrical & thermal energy consumption figures are as under :-

Year	Electrical Energy Consumption (Lakh Kwh)	Thermal Energy Consumption MKCal	Specific Electrical Energy Consumption Kwh/MT of Cement	Specific Thermal Energy Consumption Kcal/kg of clinker
2003-2004	1509.83	972533	93.20	780
2004.2005	1576.95	1000437	91.82	780
2005-2006	15212.98	1040060	88.24	770

Specific Power Consumption



Specific Thermal Energy Consumption



Energy Conservation Commitment, Policy and setup

Energy conservation receives top priority at Century Cement. In view of increasing green house gas emission, fast depleting natural resources of energy and galloping price of energy, the commitment of the management towards energy saving programme is pretty high. Consistent efforts are made to identify the potential of energy conservation and implementation of remedial measures for reducing energy consumption in the plant.

Energy Conservation Cell is headed by Executive President (Works). Head of Production, Mechanical, Electrical & Instrumentation departments are executive members of the cell. Monitoring of electrical energy consumption is done by electrical department and monitoring of thermal energy consumption is

done by process department. Monitoring of energy consumption trend is being monitored daily. Specific electrical energy consumption report is prepared daily and specific thermal energy consumption report is prepared monthly. A daily meeting of EC cell with concerned sectional heads is being held and energy consumption trend is discussed. Also progress of various projects is discussed in the meeting.

Energy Policy of Century Cement is as under:

We at Century Cement, involved in the production of Portland Cement, are committed to reduce consumption of energy (both Electrical and Thermal) to demonstrate excellence in the field of Energy Management.

This shall be achieved by the following:

- Continual improvement in the process for most efficient consumption of energy in each section
- Implementation of Newer Technologies in the plant wherever feasible
- Use of Non-conventional sources of energy for domestic purposes
- To conduct regular monitoring and auditing of Specific Energy Consumption and set new targets of consumption norms
- To train and create awareness amongst all employees in the field of energy conservation measures and efficient use of energy
- Improve overall capacity utilization of the plant

Energy Conservation Achievements

Major energy conservation projects implemented during the year 2006-2006 are as under :-

1. **Modification of cyclones and riser ducts of preheater (both K-line & C-line) of Kiln no.2.**
Hot gases generated in the kiln is sucked through suspension preheater tower by preheater fan. The suspension preheater consists of five cyclones in series. The cyclones are connected with gas ducts. Cyclone discharge openings are connected with raw mix pipe which flow into gas duct located underneath.



Preheater Tower of Kilns

Power consumption of preheater fan is depending upon the resistance created by the preheater cyclones. The concept applied is broadly the Engineering for reducing the pressure drop across the Preheater through modification in the construction of low pressure cyclone for improved efficiency and correspondingly revision in riser ducts both in terms of construction and configuration to achieve the objective and thereafter translate the achieved reduction in pressure drop to reduction in power consumption of preheater fan. The methodology does not require additional space as it is confined to modification of existing cyclones, riser ducts.

Modification of cyclones and riser ducts of both K-line and C-line of Kiln no. 2 has been done. After

modification power consumption of the preheater fan was reduced maintaining the same production level. Cost of the project was Rs. 250 lakh.

	Before Modification	After Modification
Power consumption of PH fan of K-line	490 kW	450 kW
Power consumption of Exhaust fan of K-line	170 kW	150 kW
Power consumption of PH fan of C-line	365 kW	350 kW
Power consumption of Exhaust fan of C-line	90 kW	80 kW
Total	1115 kW	1030 kW
Power Saving	1115 – 1030 = 85 kW	
Production rate of the kiln	2000 TPD	2000 TPD
Reduction in specific power consumption	85 X 24 ----- = 1.02 kWh/t of clinker 2000	

2. Installation of Dynamic Separators in place of conventional separators in Raw Mills 3 & 4

Kiln feed is prepared in Raw Mills by grinding limestone and additives (Iron ore). There are 4 nos of Raw Mills having conventional turbo separators. Efficiency of the turbo separator was poor and proper control over fineness of raw meal could not be exercised. To overcome the problem, it was decided to replace the turbo separator of Raw mill no. 3 & 4 with latest design Dynamic Separator. M/s LNV Technologies make Dynamic Separators have been installed in Raw Mill no. 3 & 4 replacing turbo separators. After installation of dynamic separator, fineness of the Kiln Feed has been within the desired norm and production rate of the raw mills was also increased from 76 TPH to 84 TPH. Hence saving in specific power consumption is achieved. Total cost of the project was Rs. 300 lakh.



Dynamic Separator at Raw Mill

	Before Modification	After Modification
Power consumption of Raw Mill main motor	1400 kW	1360 kW
Power consumption of auxiliaries with turbo separator	325 kW	424 kW
Total Power consumption	1725 kW	1784 kW
Production rate of the raw mill	76 TPH	84 TPH
Specific power consumption	22.697 kWh/ t	21.238 kWh/t
Reduction in specific power consumption	1.459 kWh/t of raw meal or 1.0 kWh/t of clinker	

3. Installation of Energy Management System in compressors.

In cement industry, there is a large scope of power saving by optimization of the compressed air usage. Considering this fact Variable Feed Control (VFC) systems have been installed for the various compressors.



Energy Management System for Compressors

The VFC is a microprocessor based PID controlled programmable system designed to optimize the compressed air usage and maintain header pressure of compressed air at precise set value. The VFC tracks the demand for compressed air and meets the requirements of air supply by variable feed. The VFC system is installed between demand sector and the receiver.

Total 4 nos of VFCs have been installed at 4 nos of compressors at a cost of Rs. 9.4 lakh.

After installation of the VFC system a saving of 2.1 lac unit per annum has been achieved.

4. Installation of third line of Mechanical Transport System in Cement Mills.

There are 2 sets of Mechanical Transport System (MTS) in cement mill section for transportation of cement from cement mills to cement silo. After increasing the production capacity of the plant, the existing MTS were not capable to handle the total cement production. Hence FK pump was being used for increased cement production. It was decided to install a third line of MTS in place of FK pump. A 350 TPH capacity MTS has been installed with a cost of Rs. 170.00 lakh and cement transport has been switched over to MTS from the FK pump.

A power saving of 2 kWh/ t of cement has been achieved.



Mechanical Transport System

5. Installation of VVVF panels at various process fan drive.

Variable Voltage – Variable Frequency drive (also called VVVF inverter) is a power electronic controller used to control the speed of 3 phase AC motors (synchronous or induction) by varying the frequency and voltage applied to the motor terminals. Voltage and frequency relationship is decided based on the motor name plate data and the load characteristics.

Advantages :

- a) Step less speed can be achieved which is required in process control.
- b) Energy saving
- c) Improvement in productivity
- d) Process improvement and better quality of product

Fan Application :

Fans are variable torque loads, following are the relationship with fan speed:

- a) Torque is proportional to square of fan speed
- b) Fan power is proportional to cube of fan speed.

We have installed 3 nos. of VVVF panels in the year 2005-2006 at various drives as under:

for C-line exhaust fan of kiln no.1.

for dust collector fan of Coal Mill no.4.

for ID fan of kiln no.2.

Approximate cost of the 3 nos. VVVF panels is Rs. 14.00 lac.

After installation of the panels total power saving achieved is 30 Kw.



VVVF Panels

6. Dynamic separator was installed in place of conventional grit separator in Coal Mill no.1.

Pulverized coal is fired into the kiln as source of heat. Fineness of the pulverized coal is very important and fuel efficiency of the kiln is dependent on proper combustion of the fine coal. The coal is ground in coal mills.



Dynamic Separator Installed in Coal Mills

Originally coal mills were supplied with Static Grit Separator. The efficiency of the grit separator was not up to the mark and desired fineness of coal could not be maintained. Higher residue in fine coal is responsible for lower combustion efficiency and higher CO generation in the kiln inlet. This resulted in to higher coal consumption.

To overcome this problem, the grit separator was replaced by high efficiency Dynamic Separator supplied by M/s LNV Technologies in two coal mills. Cost of the installation was Rs40.00 lacs.

After installation of the Dynamic separator in coal mill, we are able to maintain desired fineness of coal. This resulted into reduction in formation of CO at kiln inlet and thus reduction in coal consumption. A saving of 500 tonnes of coal per annum is achieved.

Energy Conservation Plans & Targets

Energy Conservation Measures (Planned)	Anticipated savings in		Approx. investment (Rs. lakhs)	Project commencement & completion year
	Energy Value (Lakhs Kwh)	Rs. in lakhs		
Modification of cyclones and riser ducts of preheater (both K-line & C-line) of Kiln no.1.	6.5	25.35	250.00	2006 -2007
Installation of Dynamic Separators in place of conventional separators in Raw Mills 1 & 2	5.8	22.62	300.00	2006-2007
RCC silo for Fly ash storage and its handling system.	Power saving in PPC grinding	-	170.00	2006-07
Captive Thermal Power plant of 10 MW	To improve availability of power & reduction in electrical unit cost	-	4200.00	2006-07
Close circuiting of Cement mill no. 1, 2 & 3.	Power saving & capacity enhancement	-	900.00	2006-07
Installation of multi-channel burners in Kilns	Better burnability and fuel cost saving.	-	200.00	2006-07

Environmental Management System – ISO : 14001

For better pollution control & continual improvement in our environmental performance, Environmental Management System ISO 14001-2004 has been implemented in the plant & mines. The certification was granted in Nov'2005 for a period of 3 years i.e. up to Nov'2008. Century Cement's Environmental Policy is as under:

We at Century Cement, engaged in manufacturing Portland Cement, are fully conscious of the environmental impacts of our activities. We also realize the need for minimizing them towards preservation of environment in keeping with the image of B.K.Birla Group of Companies as a socially responsible organization.

We, therefore, commit ourselves to:

- **Prevention of pollution incidental to plant operations, especially air pollution**
- **Adopting clean technology and eco-friendly processes in the plant**
- **Compliance with all applicable legal & statutory requirements**
- **Conservation of natural resources**
- **Continual improvement in our environmental performance by implementing environmental management system IS/ISO:14001**

Safety

The company has a moral and legal obligation to prevent hazards and to provide healthy working environment. The company therefore, adopts the policy set out below for the purpose of creating and maintaining a safe and healthy environment.

It is Century Cement's policy to manage its activities in a responsible manner so as to avoid causing any risk to the Health & Safety of all its employees.

All activities pertaining to the operation, maintenance, modification of the process, plant, workshop, laboratories, storages, transport, handling and use of hazardous materials shall be carried out with care and precautions with the Company's Health & Safety Policy.

Our Safety Commitment

Management

- Provide safe working conditions
- Provide system for safe control of work
- Arrange adequate training and instructions in safe working practices
- Provide information on work place hazards
- Make appropriate personal protective equipments available to all employees

Employees

- Observe and follow safety rules
- Take care of oneself and one's colleagues
- Lookout for and immediately report in case of any hazard or potential danger
- Be aware of all workplace hazards and safety guidelines and follow instructions
- Be available at or near the workplace and respond quickly and responsibly whenever required
- Always use and encourage others to use personal protective equipment and clothing indicated and provided