

BIRLA PLUS CEMENT

LEHRA MOHABBAT, DISTT. BATHINDA (PUNJAB)

UNIT PROFILE

INTRODUCTION

Birla Plus Cement is situated near village Lehra Mohabbat, District Bathinda (Punjab), has an installed capacity of One million ton per annum and primarily produces blended cement apart from OPC. Our unit has been set in December 2001 with primary objective to cater Punjab region demand, which is one of the high potential market and to produce value-adding product to reduce cost of production.

Our product image established in the market due to better quality and innovative marketing efforts and National Growth rate is going on positive side, both of these tend us to increase capacity. Fly ash usage is not only a significant cost driver and quality improver but also the most important pollution control activity as:

- It causes to reduce generation of **Green house gases** by reducing Clinker consumption.
- It causes to productively **absorb** huge quantity of Fly ash generated by thermal power plants, which create **sever particulate pollution** in the surrounding area.

Good quality of Fly Ash is available near to our plant and there for we focused on inducting technologies to increase its' percentage in raw mix like usage of grinding aid, installation of Vibrating Mill and finally installation of Roller Press.

We increased our capacity to 1.6 million ton the installation of Roller Press. This is commissioned in August-2007. We have stopped producing OPC and now only PPC is being produced. PPC is being served to mainly market of Punjab along with Chandigarh (UT), HP & J&K.

The plant has completed 5 years of its business operations. With our 5 year operation journey, we gained good results in employees involvement in the form of continual improvement, innovative thinking, team work, customer orientation, speed and focus on Value creation.

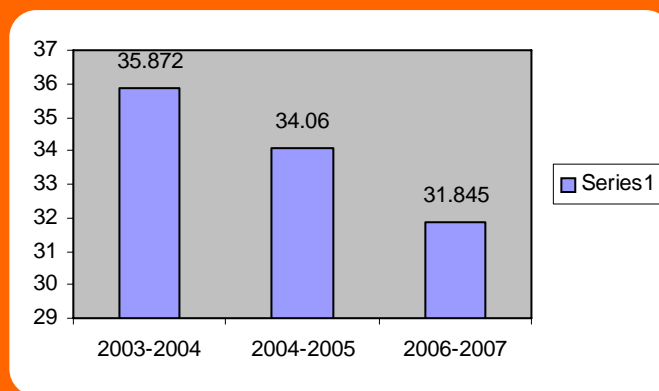


Energy Consumption

With the continuous focus on energy conservation unit has implemented various energy conservation scheme and therefore there is steady decline of specific energy consumption last three year specific energy consumption figures are shown below, which reflects continual reduction in energy consumption over last three years.

Description	Unit	2003-2004	2004-2005	2006-2007
Electrical Energy Consumption	KWH/Ton	35.872	34.06	31.845
Total energy consumption in terms of % Manufacturing cost.	%	9.40%	9.98%	8.29%
Total Energy Bill	Rs in Lakh	1398.55	1743.85	1694.48
Total Energy Consumption	KWH Lakh /Year	379.35	428.51	411.76

Specific Power Consumption



Energy Conservation Commitment, Policy and Set up

BPC visualized importance of energy conservation right from the commissioning of plant. Since 2001 BPC has been involved in continuous improvement & energy conservation. BPC team led by Unit Head and headed by DGM (Tech) constitute 2 Nos of sub committee. All team member meet in fortnight and review implementation of new identified energy saving schemes. Birla Plus Cement energy cost accounts 8 % of manufacturing cost and our unit gives utmost importance to energy conservation.

Energy Management Policy

We at Birla Plus Cement, Bathinda commit ourselves to improve our energy performance in all our activities product and services on continual basis keeping environment systems in focus and commit to develop, implement and sustain energy conservation as a mass movement through participation from grass root level.

Our Mission

To be lowest specific energy consumption among the categories in the industry we operate. We shall accomplish our mission by :

Continuous monitor, control and periodic review of specific energy consumption and benchmark with the best in Cement Industry.

- Imparting continuous and appropriate training to all employee on efficient use of electricity.
- Improve capacity utilization by up gradation of technology, process equipment and implementing innovative measures.
- Enrich our experience on energy conservation by exchange of ideas with other Group Units.
- Enhancing innovative skill of employees including casual and contract technicians with total commitment from top management .
- Reduce power consumption by implementation of energy conservation scheme and by optimizing process parameters.
- To comply with all applicable and regulatory requirement.

P.A. Nair
Sr. Vice President

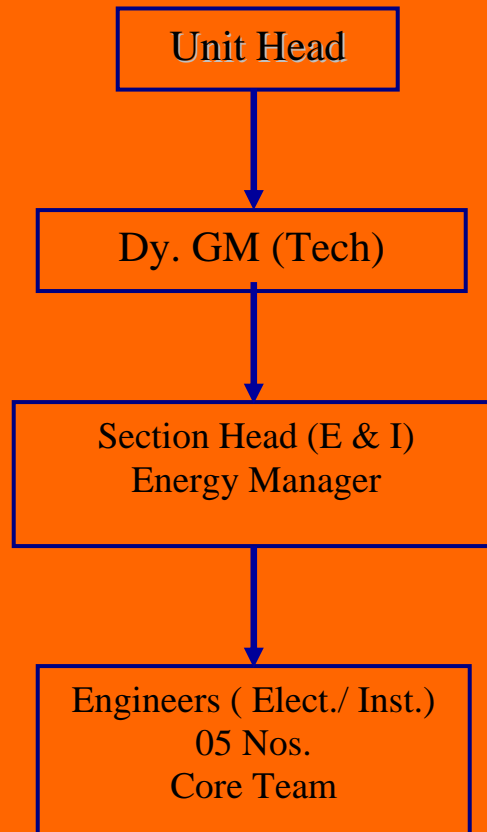
ENERGY MANAGEMENT STRUCTURE

ROLES

Periodic review of Core team performance & Administrative Support

- Monitoring of day to day power performance.
- Status of Action plan
Availability of required resources and approvals
- Allocation of responsibilities for individual task.
- Follow up and Technical Support
- Implementation of tasks
- Feed back for improvement opportunities

POSITIONS



ACTIONS FOR IMPROVEMENT

- Quantification of losses
- Use of problem solving tools
- Ideation through Knowledge Integration Program, Suggestion Schemes, different magazines Group level Annual Maintenance Meets, Consultation with Technology Research Center at Corporate office.
- Brainstorming Sessions with specific topics
- Selection of Focused Improvement Project on the basis of ROI or for improving other performance parameters
- Project Management with Work Breakdown Structure for timely completion for projects

Energy Conservation and Achievement

During the period 2004-2007, Unit implemented 15 energy saving ideas generated through periodic brain storming sessions. Annual savings of **Rs.38.568 Lakh** was achieve in 2007-2007 with an investment of 39.7 lakh with payback period of one year only. It has resulted in **percentage reduction of 6.5% in electrical energy**. Three year energy reduction is shown below.

Year	Product	*kWh/ Tonne	% Reduction over 2004 - 2005
2004 - 2005	PPC Cement	35.872	--
2005 - 2006	PPC Cement	34.06	5.051%

Year	Product	*kWh/ Tonne	% Reduction over 2005 - 2006
2005 - 2006	PPC Cement	34.06	--
2006 - 2007	PPC Cement	31.845	6.50%

1. Installed VFD in 550KW HT Motor

1.GRR used earlier for speed control of separator fan. Following were the disadvantages:

- a) Power Loss
- b) More Maintenance required.
- c) Less Accuracy of speed control.

2.Due to high variations in the Grid frequency, the speed of the separator fan was also varying causing following problems:

- a) Unstable Process Parameters.
- b) High Reject material from O-sepa Separator.
- c) High Mill Loading.
- d) High Mill Elevator Loading and hunting.
- e) Reduction in Mill Throughput

Benefits-Saving achieved Rs.15.6 Lakh Per annum with an investment of Rs31.2 Lakh.



2 Installed VFD in for silo aeration blower

FLYASH SILO & CEMENT SILO EXTRACTION BLOWERS:

BEFORE•Roots Blowers run on continuous basis during plant operation.

- Blow out of blower operated frequently with the Bin high level leading to wastage of power, wear and tear of Equipment.

- Frequent Start/Stop Operation of blowers is not possible as it will lead to reduced life of motor insulation and more wear & tear in blowers

AFTER

- LT VFDs installed for silo extraction blowers.

- Regulating Speed of above blowers helped in controlled extraction & flow of material from silo and feeding bin.

- Helped in Maintaining requisite draft inside Flyash solid flow feeder.

- Power saving achieved after installation of VFDs is 0.15 kWh/ton of cement.

- Reduced maintenance cost of blowers.

Benefits-Saving achieved Rs.7.685 Lakh Per annum with an investment of Rs 3.15 Lakh



3 Installed VFD in for cooling tower fan

BEFORE•Fan of high RPM needed frequent start/stop with respect to outlet water temperature, to control power consumption. This could lead to deterioration of winding insulation due to high starting current affecting useful operational life of motor.

- Failure of Motor bearing was observed.
- Failure of coupling between motor and cooling tower gear box was observed due to high starting stresses.
- Fear of Fatigue failure of gear box in due course of time.
- Adjusting Blade angle of fan did not meet constant water temperature requirement due to wide variations in ambient temperatures.

AFTER•LT VFD Installed for Cooling tower fan

- Speed regulation (instead of Start-Stops) is provided with respect to water outlet temperature.
- Reduced Overall Maintenance cost.
- Power saving achieved is 0.03 Kwh/ton of cement.
- Total savings achieved per annum is 1.4 lacs with investment of 0.75 Lakh**



4 Stop Two nos Cooling fan motor in Twin drive motor

Problem : Power loss in running two cooling fans of Mill main Drive

Observation:

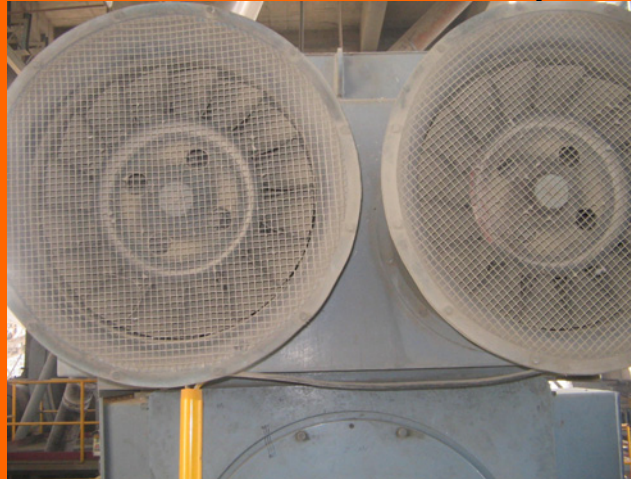
- Mill has a Twin Main Drive with Two nos Cooling fans each in parallel.
- Winding temperature of both the Main drives with both the cooling fans was 65-70degc.
- Trial taken by switching off one cooling fan each for both the drives and found the Winding temp Limits within the acceptable limits (80-82 degc)

Improvement done:

- Outcome of the Brainstorming session to reduce Specific power consumption
- PLC Program modification done to start/stop one cooling fan each of both Main Drives.
- The cooling fan will start with winding temp. of 92 degC and will stop at 82 degC and only one cooling fan each of both main drives will run continuously.

Result:

- Power saving achieved is 0.07 kwh/ton of cement.
- **Total saving per annum achieved is Rs 3.4 Lacs. Without any investment**



5. Installation of Control Air Optimizer in Compressed air

We are Operating compressor with load and Unload Pressure 6 / 6.5 Kg/Cm² and Average plant pressure was 6.25Kg/Cm² .To reduce Electrical energy consumption we installed Godrej Control Air System-model-GE-10(A),which deliver a constant pressure optimum to our plant requirement .

Advantages

- 1.Saves Energy consumed by air compressors through reduction in artificial demand.
- 2.Isolates compressors from demand side peaks and trough.
- 3.Reduce load period of compressor
- 4.Saving achieve 2.733 Lakh with an investment of 4.25 Lakh.



6. To reduce power consumption fresh air damper sealed and Hot air at around 100C temperature connected from mill outlet bucket elevator (721 BE1) top by a pipe to O-sepa separator near fresh air inlet damper.

Problem : Product Bag Filter DP at higher side and Fan power losses.

Observation:

- O-Sepa Separator fresh air inlet damper was at around 60 % open and cool ambient air was causing drop in inlet temperature by approximately 10 deg C.
- Bag filter DP running high and Fan kW also high, due to low temp at fan inlet.
- Bags getting chocked by moisture deposition at low temp of Bag Filter.
- Partial chocking of bags was causing the DP to run at higher side.
- Due to higher DP, Fan was taking high power.

Improvement done:

- Outcome of the Brainstorming session to reduce Specific power consumption
- Hot air at around 100°C temperature connected from mill outlet bucket elevator (721 BE1) top by a pipe to O-sepa separator near fresh air inlet damper.
- Fresh air damper sealed completely

Result:

- Low temperature ambient air ingress stopped and bag filter outlet temperature increased by around 10°C from earlier level.
- After increasing the temp, bag filter DP was reduced from 140mmwg to 110mmwg and bags were not getting choked.
- Less compressed air requirement for purging the bags and to maintain the DP.
- After this modification fan running at around 320 kW from earlier 340 kW and fan flow increased at low fan RPM.
- Power saving achieved is 0.15 kwh/ton of cement.
- **Total saving per annum is Rs 7.5 lacs with an investment of 0.25 Lakh**



7. Stop Two nos. water pump in water treatment plant

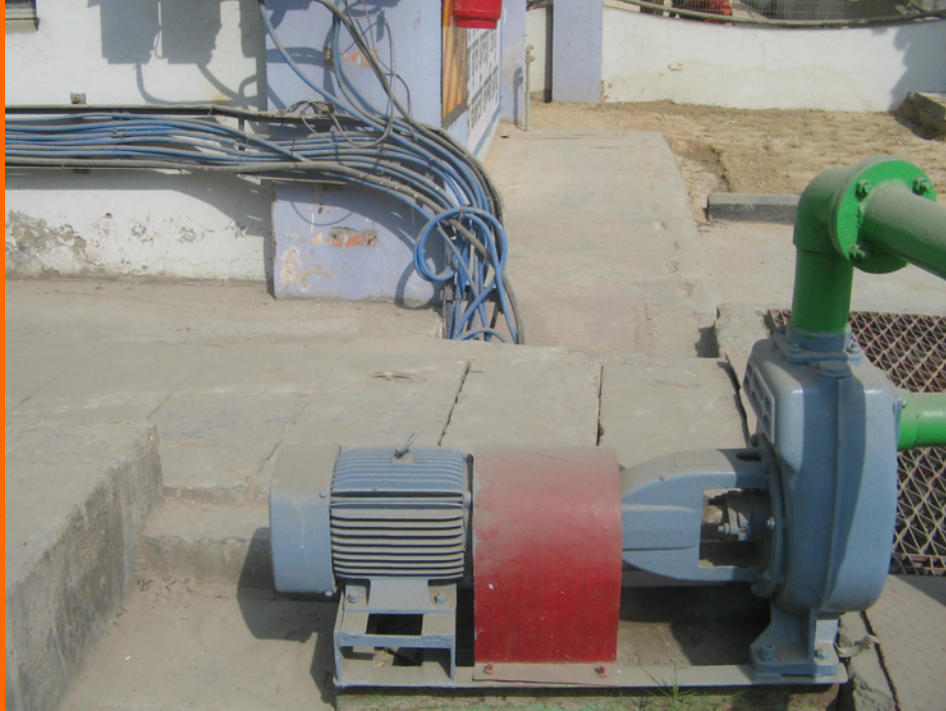
Problem : Power loss in supplying Raw water with Two pumps to Water Treatment plant.

- Two water pumps were operating to supply raw water from Tube-well to the Water Treatment Plant, thus consuming power of two pumps
- Tube-well pump (Motor kW: 9.3) was lifting water from Tube-well to a Raw water sump located near Tube-well..
- Raw Water Pump (Motor kW: 5.5) was used to shift this water from the Raw water sump to Water Treatment Plant

Improvement done:

- Out come of Brain storming session to reduce specific Power consumption
- Laid pipeline to join Tubewell pump discharge to main supply line for plant to provide water directly from Tubewell Pump to the plant and isolated the Raw water pump from circuit by providing 2 Nos gate valves. Results: The tube well pump is now directly supplying water to the WTP and meeting the plant requirement effectively.

Total saving achieved per annum is Rs 0.25 Lacs. With an investment of Rs 0.10 Lakh



Energy Conservation Plans and targets

Energy Conservation Measures (Planned)	Anticipated savings in		Approx. investment (Rs.lakhs)
	Energy Value (specify units)	Rs. Lakhs	
1 Installed HT VFD in VSK Fan Motor	525600	23.336	55
2.Installed LT VFD in Bag filter fan of packing plant .	332880	14.746	5.5
3.Replacement of inefficient motor by energy efficient motor(10 Nos)	46300	2.051	4.482
4.Installed LT VFD in Bagfilter fan of roller press plant .	525600	23.28	3.5
5.Cotrol air Optimizer to be installed for roller press compressure	73000	3.23	4.25
6.Replacement of inefficient motor by energy efficient motor(10 Nos)	42100	1.886	4.12

ENVIRONMENT:

Environmental control is one of the main priorities. We installed high quality Bag filters from quality suppliers. Emission level is well below the Central Pollution Control Board norms. For main stack it is only around 80 mg/Nm³. Similarly ambient air is also in controlled level. We have made 33 nos of Environmental Management Programs and completed 28 no.

The soil is Gangatic Alluvial loam, which is mainly suitable for Xerophytes. Such type of soil does not welcome plantation and survival become tough. We made innovative efforts to increase survival and turned the surroundings to green and covered 22 acre area under green cover.

There is no trade effluent from our unit. Only domestic sewage is there, for which we have installed STP. Water conservation is also being address as we have made a 7.0 lac liter capacity water tank for Rain water harvesting, which is functioning successfully. It is first in its kind in the whole state.

This Group synergy helps tremendously by a knowledge integration and horizontal replication of many if the Kaizen's / Innovations. This year the meet was held at Bangalore. In order to encourage better content and quality presentation ranking is used to award by penalized to various unit presentations.

Our unit also sensed the need of well-structured approach for overall and sustainable improvement to target visionary business excellence and obviously opted for implementation of WCM Business Excellence Model after successful implementation of International standard for Quality Management System (QMS) and Environmental Management System (EMS). Our unit also has successful implementation of International standard for Occupational Health & Safety (OHSAS).

SAFETY:

We gave special attention on safety related issue this is the reason we maintained ZERO Reportable Accident status and received Punjab State Safety Award for maintaining Zero Accident for year 2003 & 2005. At many places we installed safety structures as hand railings, working platforms, sheds, speed breakers, barricades and lighting posts. We displayed Safety instruction/ SOPs at many places in the plant. We provide PPE to all employees and no employee is allowed to move without Helmet in "Safety Zone". We have given proper care for safety at the time of plant design stage itself as installation of high voltage switchgears at a safe distance from the mill house & CCR, provision of tripping of breakers on AC supply in case of failure of DC System etc. Special focus is given during erection of upcoming project of capacity enhancement, regular visits of different officers and pep talk being organized regularly for contract workmen engaged in project work.