First Prize *Cement*

J.K. LAKSHMI CEMENT LIMITED

P.O. Jaykaypuram, Distt. Sirohi (Rajasthan)

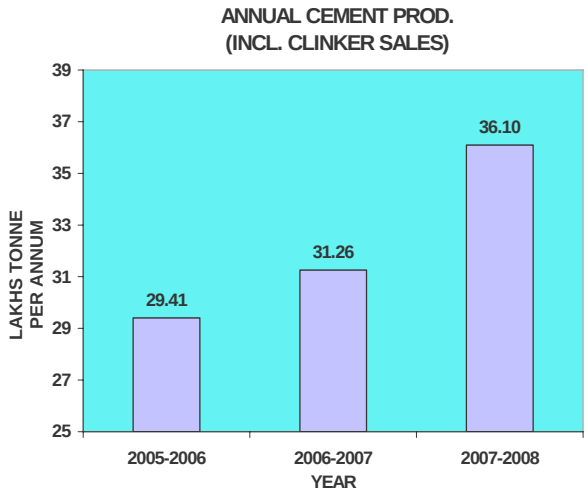
Unit Profile

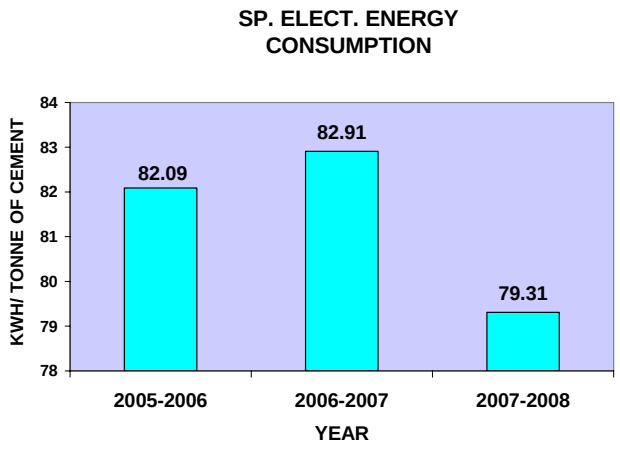
JK Lakshmi Cement Ltd (JKLC) is a member of well known JK Organisation which is one of the largest privately owned industry group in India. Today JKLC is one of the leading cement companies in the country. The Company strongly believes that a company can grow only when it includes largest sections of the society in its development. Company offers a work culture where every individual gets an opportunity to grow with the company. M/s JKLC have well defined core values such as caring of people, integrity with intellectual honesty, openness, fairness & trust and commitment to excellence. Company have also business vision to become 12 Million Tones by 2012 (12 x 12) with a business mission to be recognized as an efficient, competitive and premium cement brand.

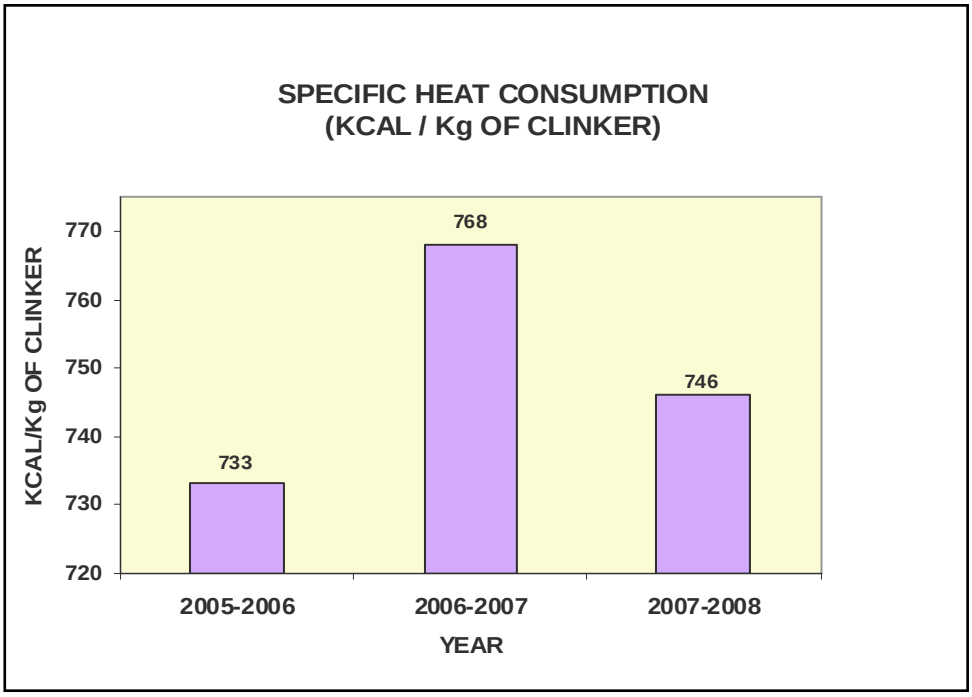
The company is confident that with the optimal use of resources and the latest technology, forthcoming years will take the company to even higher levels of glory and it will live up to the rising expectation of all the stake holders in its future journey.

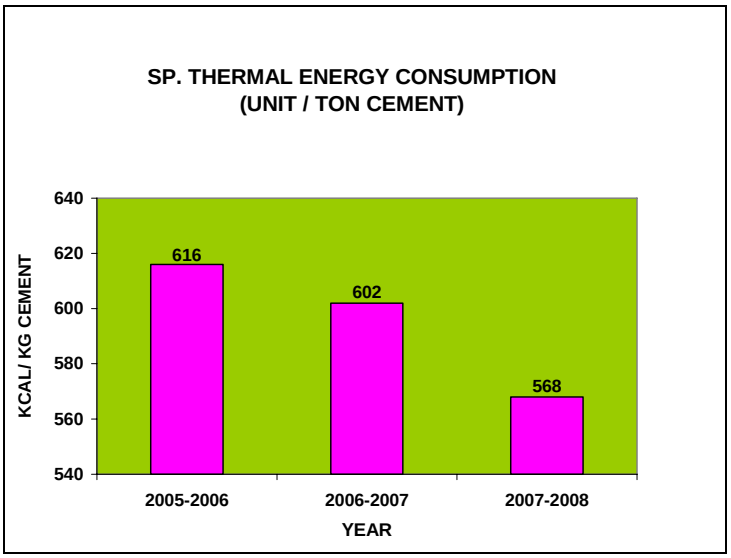
Energy Consumption

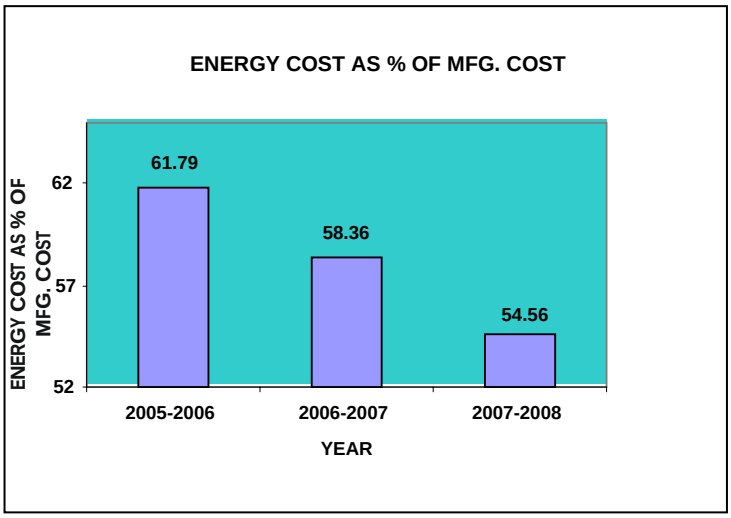
Description	Unit	2005-06	2006-07	2007-08
Installed capacity	LTPA	24.00	34.00	36.50
Actual production	LTPA	29.41	31.26	36.10
% utilization	%	122.54	91.94	98.89
Coal consumption	Tonnes	247193	271769	296329
Total cost of coal	Rs Lakhs	8177.37	10871.41	14172.42
Electricity consumption	Lakh kWh	2363.46	2592.92	2880.75
Total electricity cost	Rs.Lakhs	10469.13	11636.52	10545.18
Energy consumption in terms of % of mfg. cost (variable cost)	%	61.79 %	58.36 %	54.56 %
Specific electrical energy consumption (excluding crusher)	KWh/Ton of cement	82.09	82.91	79.31
Specific thermal energy consumption	kCal /kg clinker	733	768	746
Coal consumption	kg/ton of cement	84	84	80



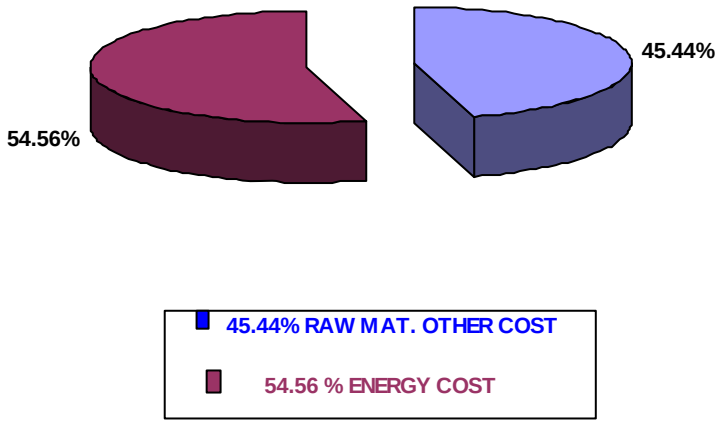



SPECIFIC HEAT CONSUMPTION
(KCAL / Kg OF CLINKER)
KCAL/Kg OF CLINKER
770
760
750
740
730
720
768
746
733
2005-2006
2006-2007
2007-2008
YEAR


SP. THERMAL ENERGY CONSUMPTION
(UNIT / TON CEMENT)
KCAL/ KG CEMENT
640
620
600
580
560
540
616
602
568
2005-2006
2006-2007
2007-2008
YEAR


ENERGY COST AS % OF MFG. COST
ENERGY COST AS % OF MFG. COST
62
57
52
61.79
58.36
54.56
2005-2006
2006-2007
2007-2008
YEAR

ENERGY COST AS % OF MFG. COST
FOR THE YEAR 2007 - 2008



Year	Electrical Energy Consumption		Thermal Energy Consumption	
	kWh/ton of Cement (excl. crusher)	% Reduction over 2004-2005	kCal/kg of Clinker	% Reduction over 2004-2005
2004-2005	83.72	-	746	-
2005-2006	82.09	1.95 %	733	1.74 %
2006-2007	82.91	0.97 %	768	(-) 2.95 %
2008-2008	79.31	5.27 %	746	0 %

Energy Conservation Commitment, Policy and Organizational Set up

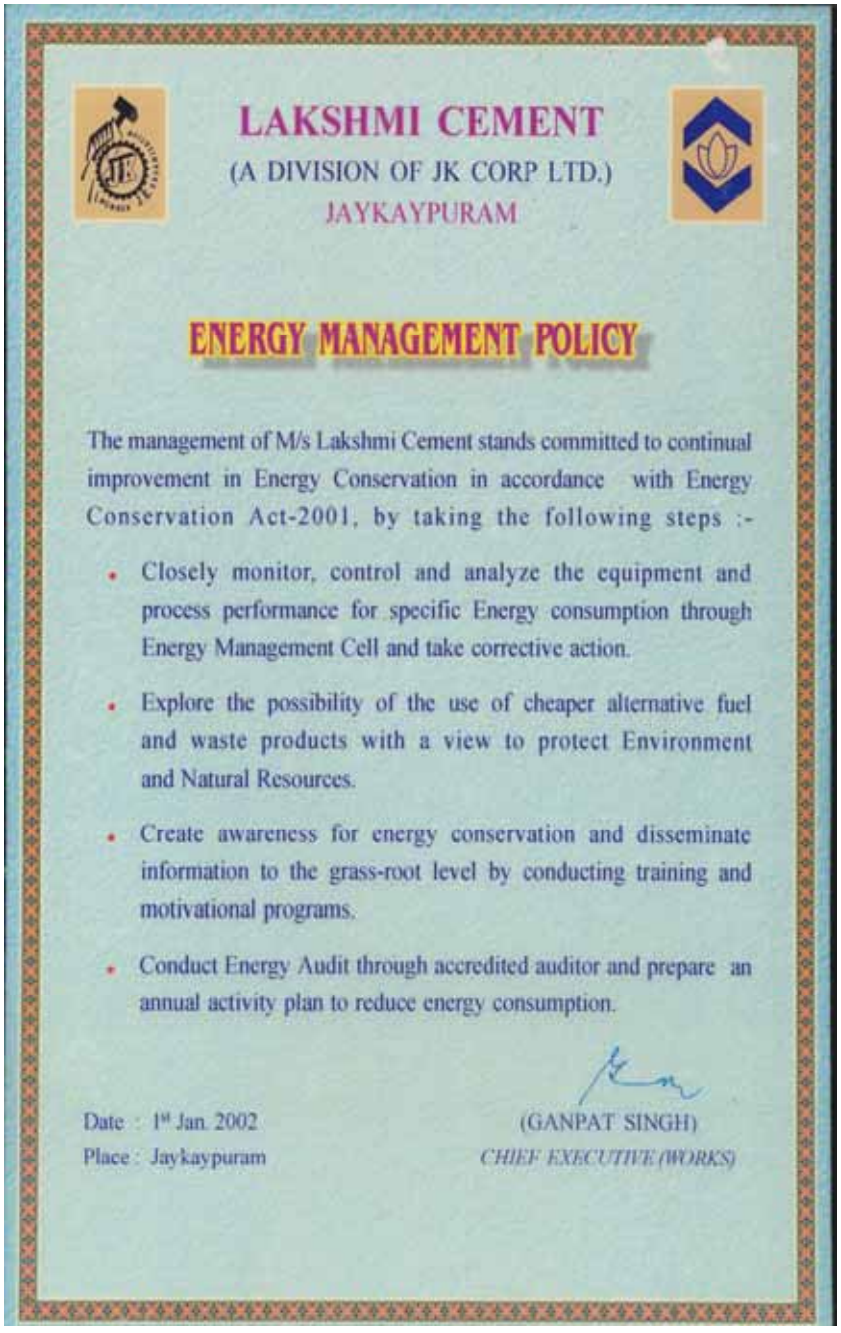
The management of M/s.JK Lakshmi Cement Ltd. is committed to total energy management and prevention of energy wastage by:-

- Close monitoring, control and analyze the equipment and process performance for specific energy consumption.
- Explore the possibility of cheaper alternative fuel and waste products.
- Create awareness for energy conservation.
- Conduct training programs for energy consumption.
- Conduct energy audit to identify opportunities for improvement of overall energy efficiency of the plant.

The management considers energy efficiency of equipment on the basis of cost benefit analysis while purchasing the new equipments. Energy Management cell headed by Energy Manager is functioning

for regular monitoring and control of wastage of energy. The unit involves different cement process experts/consultants/energy audit-agencies to identify & suggest scope of improvement in energy efficiency. Actively participate in cement sector task force meeting, organized by B.E.E. and exchange the views regarding energy consumption norms.

The energy management committee chaired by the Chief Executive (Works) meets every Monday at 4.00 PM to review the weekly energy performance, action plan and ENCON activities.



LAKSHMI CEMENT

(A DIVISION OF JK CORP LTD.)

JAYKAYPURAM

ENERGY MANAGEMENT POLICY

The management of M/s Lakshmi Cement stands committed to continual improvement in Energy Conservation in accordance with Energy Conservation Act-2001, by taking the following steps :-

- Closely monitor, control and analyze the equipment and process performance for specific Energy consumption through Energy Management Cell and take corrective action.
- Explore the possibility of the use of cheaper alternative fuel and waste products with a view to protect Environment and Natural Resources.
- Create awareness for energy conservation and disseminate information to the grass-root level by conducting training and motivational programs.
- Conduct Energy Audit through accredited auditor and prepare an annual activity plan to reduce energy consumption.

Date : 1st Jan. 2002

Place : Jaykaypuram

(GANPAT SINGH)

CHIEF EXECUTIVE (WORKS)

Energy Conservation Achievements

Up-Gradation of Kiln-2 & 3 Main Drives to Increase Kiln RPM from 4.2 to 4.6
(A Low Cost Technological Innovation)

The up-gradation of kiln-2 and kiln-3 main drive has helped the company to beat the inflation in the current market scenario by increasing kiln output and considerable reduction in power

Previous Status
The plant was initially designed for 2800 TPD. Numbers of in house modification with practically no-capex and small capex were carried out to enhance the capacity to 4200 TPD. Above 4200 TPD, following problems were faced.

1. Build-up at kiln inlet
2. Ring inside the kiln
3. kiln Back spillage
4. Once filled kiln is stopped, it used to take 1hr to come on main drive

In order to get rid off of the above-mentioned problems and to enhance capacity to 4500 tpd, it had been decided to upgrade main drive of both the kilns.

Energy Saving Project
The kiln drive up-gradation of both kilns has enabled the plant to get consistent clinker production at 4500 TPD. Besides clinker production, it helped the company to considerably reduce electrical energy consumption.

Benefits of the Project
Now the plant is able to get consistent clinker production from both the kilns at 4500 TPD. Besides this, it has helped in reducing electrical energy consumption and fugitive dust emission etc. A comparison of parameters before and after modification is given below.

Parameter	Before Modification	After Modification
Kiln production	4200 TPD	4500 TPD
Kiln rpm	4.2	4.5
Kiln (% Filling)	13.8%	13.8%
Kiln power (kW)	320	440

Benefits of this project
1. Higher clinker production.
2. Reduction in specific power consumption.

Cost benefit analysis (For one kiln)

Annual savings (Electrical energy)	:	Rs. 124.70 Lakhs.
Annual saving due to increase in Clinker production	:	Rs. 2231.00 Lakhs.
Total saving	:	Rs. 2355.70 Lakhs
Investment	:	Rs. 450.00 Lakhs.
Simple payback	:	3 Months

(A VIEW OF UP-GRADED KILN – 3 MAIN DRIVE STATION)	(OTHER SIDE VIEW OF UP-GRADED KILN–3 MAIN DRIVE STATION)
	

Energy Conservation Plans and Targets

S. No.	Energy Conservation Measures (Planned)	Anticipated Savings (Rs.Lakhs)	Approx. Investment (Rs.Lakhs)	Project Commencement & Completion year
1	Up-gradation of Old Kiln (Unit-1) for production and energy efficiency improvement		20100.00	Mar - 09
2	Installation of one more cement mill to increase grinding capacity.	14391.00	2500.00	Jan - 09
3	Installation & commissioning of one cement mill with cement silo and packer machine at split location.		5000.00	Jan - 09
4	Installation of fly ash drier for cement mills Dec – 08	150.00	700.00	Dec - 08
5	Replacement of fossil fuel by biomass in pyro-processing.	75.00	330.00	Dec - 08
6	Retrofitting of C.A. Fan of Cement Mill – 2 with high efficiency Fan	10.00	15.00	Dec - 08
7	Power Generation from Waste Heat Recovery system	2275.00	9600.00	Jun - 2010

Environment and Safety

The unit has made sincere efforts since 1982 in the field of plantation. More than 1.5 lakhs plants are planted & the process is still going on.

JK Lakshmi Cement Ltd. have a very strong feeling to keep close monitoring over the efficiency of pollution prevention measures. The Environment Management Cell (EMC) ensures the full efficient utilization of pollution control measures with the help of online emission monitoring.
The plant has installed bag house & ESP at its major production units. Bag house is fitted with Homo-polymer, PTFE laminated fiber glass & Polyester bags at various sections like Cement Mill, Reverse air bag house & Coal Mill.

There are zero discharge effluents from industry. Only domestic waste water (sewage) is being treated at sewage treatment plant (STP).

Major Environmental Projects taken during the year 2006- 07 & 2007-08

Reduction in fugitive emission

- Cement flooring of truck parking area (14000 Sq feet)
- Cemented road inside the plant, colony & road to highway (5.0 Km)
- Installation of vacuum cleaner in packing plant
- Purchase of road sweeping machine

Reduction in GHG emission and greenery improvement

- Development of garden / parks in township (15.0 hectare area)
- Plantation of 5000 saplings JETRPHA in mines area
- Plantation of 10000 saplings in plant and township
- Plantation of 500 NEEM trees both sides of road to main highway

Water Conservation

- Rain water harvesting to recharge bore wells
- Check dams construction in mines area for water harvest
- Creation of three dams for rain water storage in township (45000 m^3)

Safety

JK Lakshmi Cement Ltd. is an OHSAS 18001:1999, certified cement plant. It continuously focus on improving its Safety & Occupational Health standards and recent procurement of a Fire Tender in January '2008 bears testimony to this fact. Every employee at JK Lakshmi Cement Ltd. realizes the importance of safety for himself, his co-workers as well as the equipment.

Second Prize *Cement*

PRISM CEMENT LIMITED

Manakahari, Satna (Madhya Pradesh)

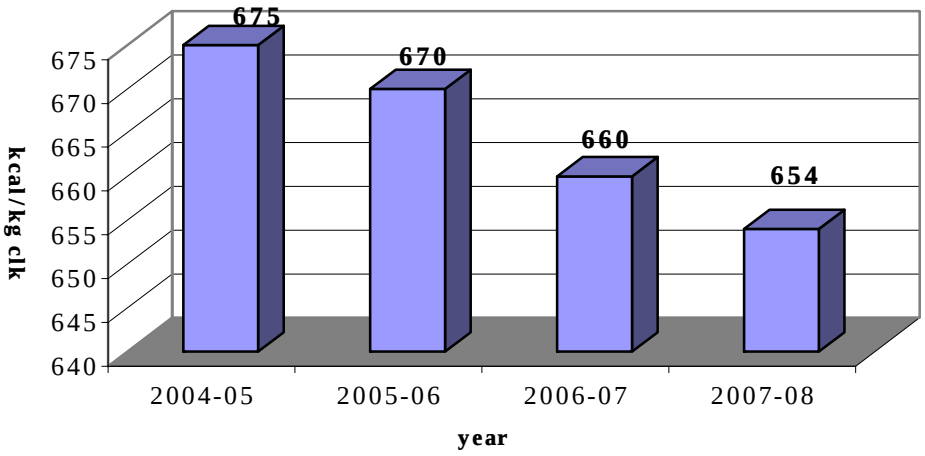
Unit Profile

With an objective of being an active participant – in the dynamics of future – of the Nations' march towards total industrialization and energy conservation, Prism Cement Ltd has set up a state-of-art, energy efficient cement plant near Satna, in Madhya Pradesh. Most advanced machinery and technology imported from M/s FLSmidth Denmark and state-of-art processes lend it a futurist environment.

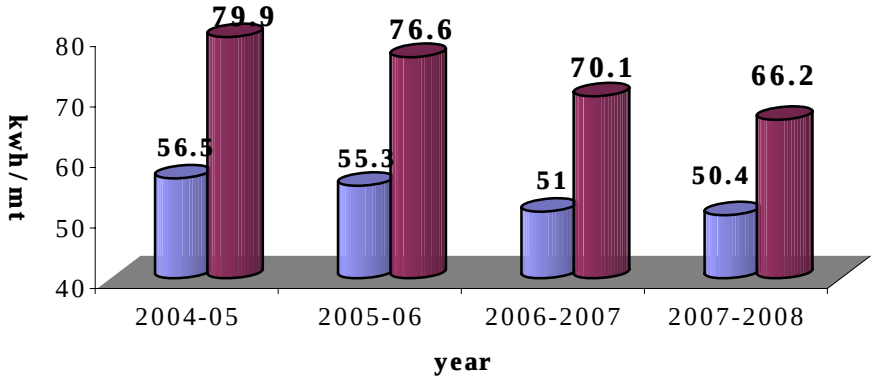
Energy Consumption

Prism Cement Limited firmly believes in attaining, retaining and reforming its' energy conservation initiatives time to time. Originally installed efficient equipments and system, gives glare to the energy conservation drive.

Year-by-year increasing production demand is associated with decreasing the specific energy consumption.



The above fact is accompanied with better electrical energy conservation also. kWh/MT of clinker and cement witnesses' result of energy initiatives.



Perhaps, these achievements have opened broad road to move ahead in coming years.

Energy Planning

Energy planning for next 3 years with 2005-06 as base year is as follows.

Year	kWh/MT cement	kCal/kg clinker
2007 – 08	66.2	654
2008 – 09	65	650
2009 –10	64	650

Energy Conservation Commitment and Set up

Prism Cement's energy conservation mission is committed to explore available potential and to adopt technology advancements extending also to upcoming projects of company. It has firm internal set up for execution of new energy initiatives. Normal process of this set up is as below.

Import energy cons. activity information or own ideas

↓

Send to Plant technical services

↓

Study & techno-commercial feasibility of project & submit to management

↓

Execution and/or monitoring by Project Dept.

↓

Project verification by related dept.

↓

Project assessment and benefits by Tech services

Besides, periodic meeting on energy conservation are held by the Unit Head to organize the planning & review of activities.

Energy Conservation Achievements

a) Conversion of PA fan, RABH RA fan, cooler seal air fan, speed regulation by damper control to V/F control.

b) Elimination of LS crusher compressor by optimizing air requirement.

c) Replacement of belt conveyors

d) Installation of advanced energy management system

e) Modification of belt conveyors in packing plant

f) Modification of stacker boom belt.

g) Complete replacement of water pipelining and optimization of water management for plant use.

h) Committed process optimization i.e cooler and fan efficiency, false air reduction, secondary & tertiary air optimization, cooler recuperation efficiency optimization and bag filters optimization.

i) Upgradation and optimization of flyash system

j) Installation of expert control system in Cement Mill

k) Installation of IGBT based SPRS in Calciner and Kiln String fans

Environment and Safety

Environment management is an approach of resource conservation and minimization of impact by human activities on the physical and ecological environment. Prism cement limited has a competent technical team taking care of the operation and maintenance of equipments efficiently.

The major pollutants of air in cement plant for the suspended particulate matter are from the various stacks and fugitive emission due to material handling. The following pollution control equipments have been installed at section of the plant.

1) Kiln/Raw mill	ABB 14 module Reverse air bag house 1 no.
2) Cooler	ABB ESP of 6 fields 1 no.
3) Cement mill	ESP of 3 fields – 2 nos.
4) Coal mill	Bag filter 1 no.
5) Transfer points	Bag filters no.65.

Pollution control equipments at Prism Cement are designed for emission standard of only 50 mg/nm3 for all the main stacks, which is relatively lesser than standards given by the state pollution control board for other stacks. Prism is committed to maintain this stringent standard.

ULTRATECH CEMENT LIMITED

A.P. Cement Works

Tadipatri, Distt. Anantapur (Andhra Pradesh)

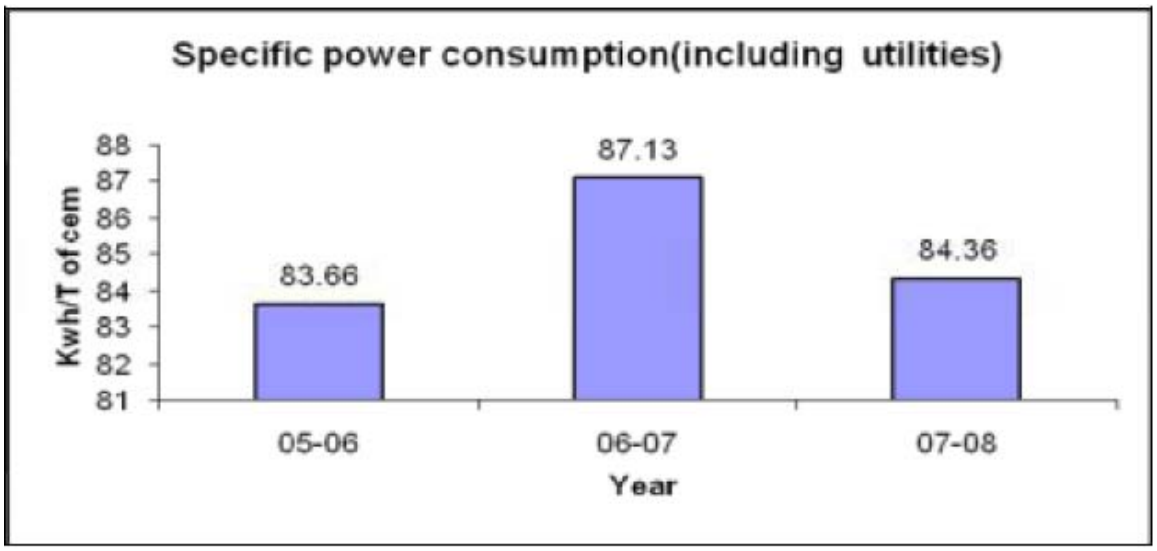
Unit Profile

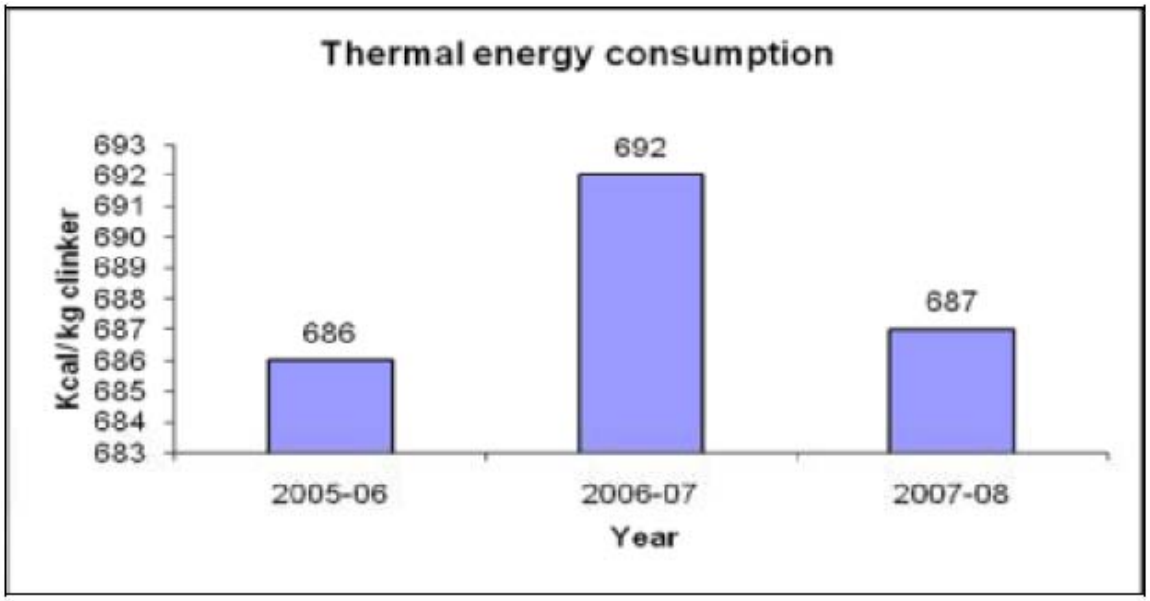
UltraTech Cement Division (part of Aditya Birla Group) consists of five integrated Cement manufacturing Plants and five grinding Units with a total installed capacity of 17Million Tons per annum (MTPA) located in different parts of the country. **AP Cement Works (APCW), located at Tadipatri, Anantapur Dist, A.P.** with an Installed Capacity of 2.00 MTPA was commissioned in April'1998 with the latest Cement manufacturing technology from F.L.Smidth & Co, Denmark. The plant has been upgraded to 2.70 MTPA through major debottlenecking exercise in 1999 and 2002 by adopting latest technologies. It is always in the forefront in adopting latest technologies or innovations.

APCW manufactures three types of Cement, Ordinary Portland Cement (OPC), Portland Pozzolona Cement (PPC) and Portland Slag Cement (PSC) for its major customer groups like Dealers, Stockists Builders / Contractors,cement based Industries. Its ideal location, as far as market is concerned is its advantage. It is, equidistant from all the three major cities in the south Hyderabad, Bangalore and Chennai and caters to Karnataka, Tamilnadu, Kerala and Goa markets, in addition to Andhra Pradesh. The finished product is sold through the Marketing Department, which has a wide dealer network.

Energy Consumption

S.No.	Particulars	Unit	2005-06	2006-07	2007-08
1	Electrical Energy*	kWh /Ton of Cement	83.67	87.12	84.36
2	Thermal Energy	kCal /kg of Clinker	686.1	691.0	686.7
3	Total Manufacturing Cost	Rs. Lakhs	24766.05	28868.85	30959.86
4	Total Energy Bill	Rs. Lakhs	7653.47	5715.97	6567.89
5	Energy as % of Total Cost of Production	%	31	20	21





Energy Conservation Commitment, Policy and Set up

The Energy Conservation Cell is in existence since plant commissioning. The Energy Conservation Cell comprises of highly competent cross-functional positions of various departments. There is a top management commitment for the continuous reduction in the energy consumption. The energy conservation projects are always given top priority. The financial return is not the only criteria for selecting the energy conservation projects. Involvement of all the people is the driving force behind the success of energy conservation initiatives in the plant. An investment of Rs. 3465.20 lakhs was done in last three financial Years.

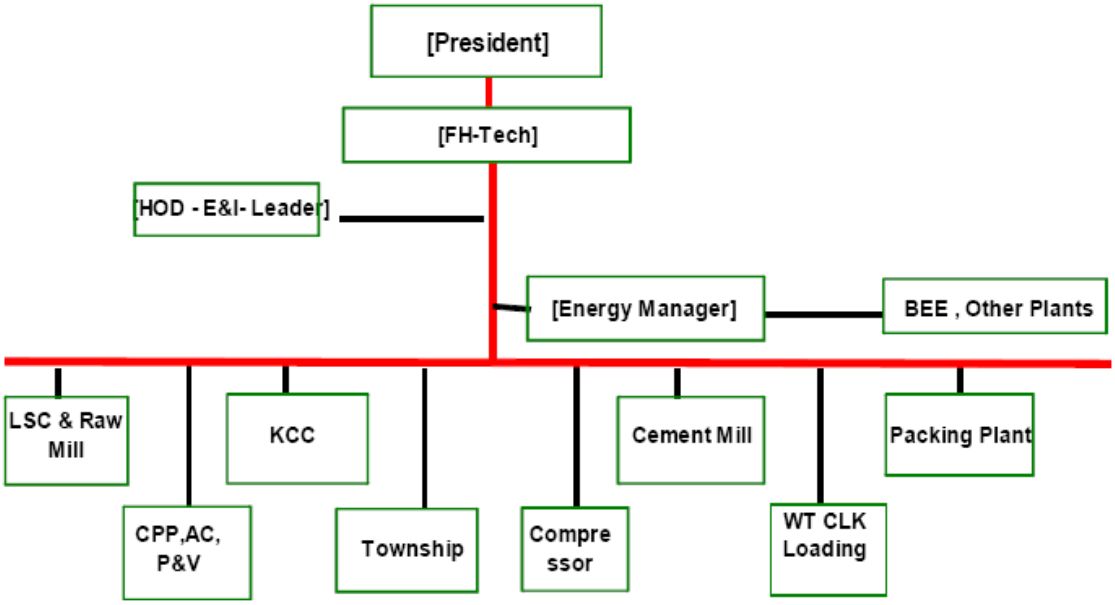
ENERGY POLICY

We shall be committed to

- ❖Explore & maximize the use of latest & efficient technology to reduce energy consumption.
- ❖Reduce the consumption of coal, electricity & fuel oil through process optimization in order to reduce the Green House Gas emissions.
- ❖Utilize wastes such as fly ash & slag to conserve raw materials & use of alternate fuels to conserve fossil fuels.
- ❖Involve all the employees by motivating and training them on energy efficient practices throughout the plant and to improve productivity, cost effectiveness and work environment.
- ❖Spread awareness among all employees and their families for conserving energy.

PS Mazumdar
Unit Head

ENERGY ACCOUNTABILITY CENTER AT APCW - TADPATRI

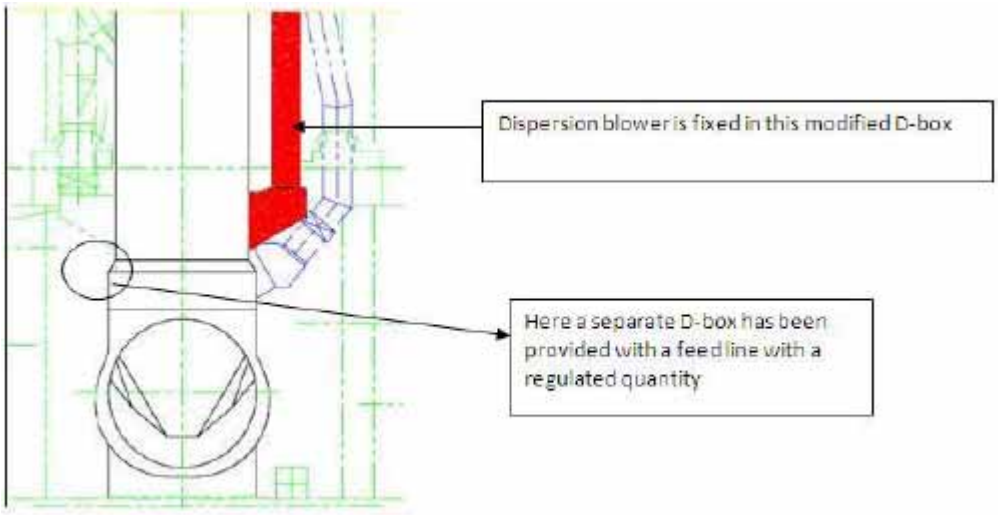


Energy Conservation Achievements

1. Enhancing of Raw Mills output from 342 Tph to 410 Tph by suitable modifications in the operations, optimizing the circuit and incorporating changes in the product design.

Annual Savings observed: Rs. 304.00 Lakhs

2. Optimizing kiln operation efficiency, bringing stability in productivity levels and reducing electrical and thermal energy losses.

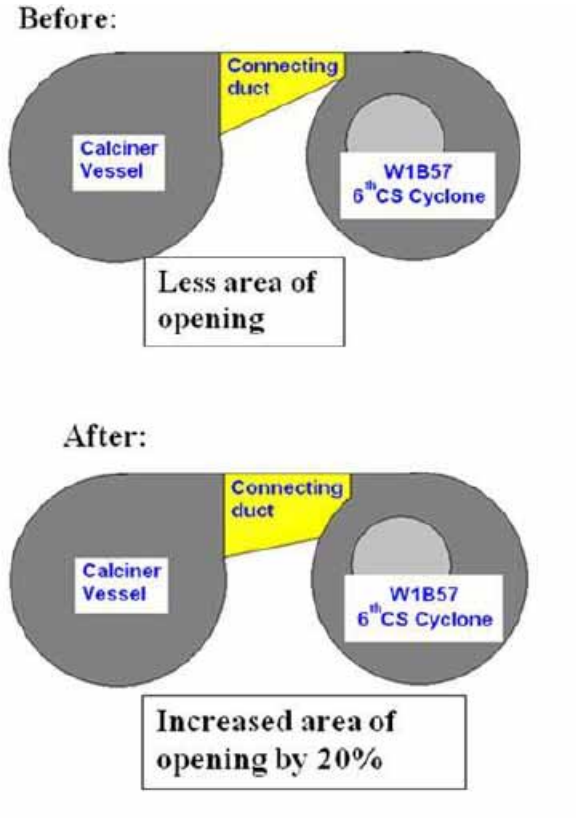


Annual Energy savings : Rs. 97.89 lakhs
Investment : Rs. 15.00 lakhs

3. Guest House was using electrical power to water heating in rooms for hot water supply. Hence introduced Solar heating systems for water heating. Totally 14 nos units are installed.

Annual savings observed : Rs. 4.00 lakhs
Investment : Rs. 1.02 lakhs

4. 6th cyclone entry is widened in calciner string of pre heater . Due to this modification load on CS fan has reduced from 2100 to 1800 per hour as the pressure drop has reduced.



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Annual Savings observed : Rs. 58.69 lakhs
Investment : Rs. 30 lakhs

Environment and Safety

Corrective & preventive measures are identified and implemented as per need based. APCW has established an exclusive cell for improvement of EHS aspects in a focused way and the structure is as shown here.