

Annexure 'A' to Directors' Report

Section 217(1)(e) of the Companies Act, 1956, read with the Companies (Disclosure of Particulars in the Report of Board of Directors) Rules, 1988.

A: CONSERVATION OF ENERGY

(a) Energy conservation and efficiency measures were undertaken in various areas of the cement plants:

- Thondebhavi Plant started to operate the VRM with ZERO table water spray and successfully stopped heating of the system during mill startup which saved LDO and also improved specific electrical energy. Optimized the compressor distribution system in mill and packing plant. Optimized the velocity at the VRM Louver area and reduced the bag house fan flow.
- Madukkarai Plant replaced existing separator with high efficiency V-Separator at VRM. Installed Variable Speed Drives for cooler fans (7 nos), Positive Displacement Blower, Mill Vent fan, Separator Vent Fan. Optimised compressors by changing pipeline layout. Installed high efficiency fan impellers for cooler fans 3 and 4.

Installed and hooked-up New Air Cooled condenser in place of existing condenser to increase the de-rated generation capacity from 8 MW to its full capacity of 15 MW in the Captive Power Plant.

- Jamul Plant installed medium voltage Variable Speed Drive for Kiln 3 Waste Gas Fan. Installed multistep controllers in Raw Mills dust collector compressors for better control of outlet pressure. Dense Phase pump conveying pipe-line was re-routed to avoid pressure drop. All pre-heater cyclone dispersion plate angle measured and adjusted for better heat transfer. Reduced radiation losses by thermal imaging and corrective action. Installed bag filter on top of preheater to remove the cold air from material conveying blower. Increased coal mill output by improving capacity of circulating fans.
- Lakheri Plant reduced cooler exhaust gas flow from 1.2 to 1.0 Nm³/kg Clinker, by attaching cooler plate to plate gaps, inter and under compartment sealing. Reduced cooler exhaust gas temperature from 240 deg C to 220 deg C by process optimization. Reduced heat loss due to radiation and convection in PH tower, Calciner, kiln shell, tertiary air duct, cooler and kiln hood by refractory management, heat resistant paint on kiln shell, controlling shell temperatures through raw mix optimization for stable coating formation in kiln. Met requirement of compressed air for old cement mills by interconnecting with new cement mill compressor, thereby stopping one compressor of 132 KW. Installed energy efficient impellers for cooler fan 4 and 10.
- Bargarh Plant started utilization of HPGR-1 as semi finished grinder for Cement mill 1 and 4 to increase output rate of these mills. Optimized pre-heater fan. Improved output of Raw mill by Optimization of feed size. Installed GRR in Raw Mill Fan. Compressed air lines in Slag VRM and mixing plant were re-routed in order to eliminate one 90 KW compressor.
- Chanda Plant installed Variable Speed drives for ID Fan of Limestone Crusher Bag Filter at Mines and transporting Clinker Pipe conveyor. Optimised loading of Power Transformers. Improved output from Raw Mill by optimizing Dam ring height.
- Kymore Plant Optimized DDF (Dual combustion De-nitrification Furnace) firing blower by reducing coal conveying air. Modified cooler house shoe which has eliminated frequent stoppage of K-1. Optimised Voltage and frequency at generation side and voltage at distribution side. Changed purging of all Bag filter to DP based mode for Compressed air saving. Conducted CFD (Computational Fluid Dynamics) study and modified 4th stage cyclone for K-1 and 3rd cyclone dip tube. Optimised

grinding media for both the Raw-mills for Productivity improvement. Reduced suction pressure of cooler fans by installing bell mouth at suction side. Eliminated Raw mill-1 and 2 circuit dust collector Bag house Fan. Eliminated Fly ash air-slide blower. Eliminated Service pump at Captive Power Plant.

- Gagal Plant commissioned Rota-scale for calciner coal and kiln feed in G-2. Installed Variable Speed Drives for Motor Cooling Fans for Main Motors of Raw Mill -2, Cement Mill -2, Kiln 1 BH Fan, Raw Mill 1, K1 Kiln Stream Fan, K1 Calciner String Fan, Kiln 1 ID FAN, Cement Mill 1. Variable Speed Drive were also installed for Kiln Coal Positive Displacement Blower, Raw Mill's Silo Dust Collector Fan, Cooler ID Fan, K1 Kiln Feed Dust Collector Fan. Installed new air-slide in Pre-grinder for Cement Mill 5 to take the Cyclone product as final product.
- Wadi Plant replaced two Gypsum conveyors with a single conveyor at Wadi II. Installed Variable Speed Drives for Calciner coal firing blowers at Wadi II and for Cement Mills - 1, 4 and 5 dust collector fans at Wadi I.
- Tikaria Plant modified cooling water circulation line of Cement Mill # 2 & 3 and VRM, thereby stopping two cooling tower pumps. Installed multistep controllers in all the fly-ash unloading compressors. Revived Variable Frequency Drives of Mill Vent fan and separator dust collector fans of all the three Cement Mills. Replaced intermediate diaphragm, feed head liner and re-graded grinding media of Cement Mill # 2. Replaced first chamber shell, liner plate and re-graded grinding media of Cement Mill # 1.
- Chaibasa Plant stopped one compressor in flotation section by removing the intercooler and converting the HP cylinder to LP cylinder. Removed orifice meter from VRM inlet fan. Modified the compressed air line to stop one small compressor. Rectified energy saver for compressed air optimization system.
- Detailed Energy Audit was conducted at Gagal, Kymore, Lakheri, Chaibasa, Kudithini & Encore plant, and detailed compressed air audit was conducted at Wadi plant.
- Energy Monitoring System was commissioned at Wadi II, Thondebhavi and Kudithini plant.
- Capacitor banks have been added to the system across ACC plants to improve plant power factor.
- Replacement of conventional lamps with Compact Fluorescent Lamps and LED light for plant and colony lighting was done across ACC plants.
- ISO 50001 Certification Audit was conducted for Kymore, Jamul, Lakheri and Gagal plants.
- Commissioning of New Packer with wagon loading platform at Kymore.
- Thondebhavi Plant won 2nd Prize at Prestigious BEE National Energy Conservation Award's 2012, while Lakheri Plant was awarded by Confederation of Indian Industries as well as Govt. of Rajasthan.

Green power –

- The Wind Farm installed at Rajasthan generated 14.63 Million Units of green energy during 2012, as compared to 13.73 Million units generated during 2011.
- The Wind Farm installed at Tamil Nadu generated 24.2 Million units of green energy during 2012, as compared to 21.55 Million units generated during 2011.
- The Wind Farm installed at Maharashtra generated 3.50 Million units of green energy during 2012, as compared to 3.61 Million units generated during 2011.

Alternative Fuels –

In 2012, the Company co-processed different types of alternative fuels totaling 53,343 tonnes.

(b) Additional Proposals being implemented for further conservation of energy :

The installation of Medium Voltage and Low Voltage Drives is being carried out as part of “Fast Track Projects” in two phases across ACC plants. This will ensure substantial saving in electrical energy during 2013, as well in ensuring better process control.

(c) Impact of the above measures for reduction of energy consumption and consequent impact on cost of production:

The measures stated in points (a) and (b) above would further improve the thermal and electrical energy efficiency of the Plants. During the year 2012, the electrical energy reduced by 1.59%, thermal energy reduced by 0.81% and clinker factor reduced by 1.79% over 2011.

Form A Power and Fuel Consumption – Cement

	Current Year			Previous Year		
	Lakh Units (Kwh)	Total Cost (₹ Lakhs)	₹ per Unit	Lakh units (Kwh)	Total Cost (₹ Lakhs)	₹ per Unit
Electricity (Gross)						
a) Purchased :	6152	32949	5.36	6917	33625	4.86
b) Own Generation :						
i) Through Diesel Generator	43	570	13.28	30	531	17.40
ii) Through Steam Turbine / Generator	17876	76829	4.30*	17614	65521	3.72

* Excluding impact due to change in depreciation method for Captive Power Plants.

	Quantity (Lakh Tonnes)	Total Cost (₹ Lakhs)	Average Rate (₹/Tonne)	Quantity (Lakh Tonnes)	Total Cost (₹ Lakhs)	Average Rate (₹/Tonne)
Coal (for kiln)**	23.29	132094	5672	24.30	122764	5053

** Does not include other fuel / alternative fuels used in kiln.

Consumption per unit of Production

	@ Standard	Current Year	Previous year
a) Electricity Kwh/T of Cement #			
Semi-dry / Dry Process	98-110	84	84
b) Coal for kiln K.cal/Kg of clinker			
Cement -			
Semi-dry / Dry Process	720-990	736	742

@ Source : Publication of Confederation of Indian Industries

Excludes non-process power consumption.

(B) TECHNOLOGY ABSORPTION**Research & Development****1. Specific areas in which R & D is carried out by the Company**

- a) Improving quality of blended cement through innovative processing utilizing industrial by-products for improved quality Performance of ACC Plants
- b) Conservation of resources through maximization of use of low-grade limestone for cement manufacture
- c) Development of application Oriented Cements with decreased CO2 emissions
- d) Development of new products or discovering new methods of analysis
- e) Productivity research for increase efficiency in use of resources
- f) Recycling of wastes and research for efficient use of scarce materials
- g) Characterization of Industrial wastes and looking into possibilities environmentally friendly co-processing of wastes in cement manufacture leading to thermal substitution and conservation of natural resources
- h) Development and use of Cement Grinding aid and accelerators for PPC & PSC for improved performance in Concrete and reduced clinker factor in Blended Cements
- i) Improving the grinding efficiency of Petcoke and Coal
- j) Development of Cements tailored for specific market clusters and application segments
- k) Development of cement based Niche products
- l) Quality Benchmarking exercise for different market clusters of ACC products

2. Benefits derived as result of above R & D

- a) Effective use of marginal quality raw materials and fuels with improved clinker quality
- b) Increased absorption of blending materials like fly ash and slags in blended cements
- c) Effective replacement of the costlier natural Gypsum by cheaper by product Phospho gypsum without affecting the quality of cement
- d) Maintain a lead position in all the market clusters of the country
- e) Launch of special high performance products like F2R, Concrete Plus , Coastal Plus for specific Market segments / Market climatic conditions
- f) Reduction in sp.power consumption for grinding
- g) Effective use of SPC at each stage of Cement Manufacture for improving consistency of Operations and consistency in Product Quality
- h) Fuel efficiency

3. Future plan of action

- a) Exploratory research works on the above specific areas
- b) Focus on development of products aimed at enhancing use of cement in various applications and development of application Oriented Cement based cementitious material
- c) Use of waste / byproducts in cement manufacture as alternative materials
- d) Improve product quality particularly with respect to long term durability and reduction in cost of manufacture

4. Expenditure on R & D

	₹ Lakhs
a. Capital	172
b. Recurring (Gross)	652
c. Total	824
d. Total R&D expenditure as percentage of total turnover	0.07

5. Foreign Exchange Earnings & Outgo

	₹ Lakhs
Foreign exchange earned	Nil
Foreign exchange used	7830

Annexure 'B' to Directors' Report

Employed for Full Year

Sr. No.	Name	Remuneration Gross (₹)	Designation & Nature of Duties	Qualification	Date of Commencement of Employment	Total Experience (Years)	Age in years	Last Employment
1	ANIL BANCHHOR	6244996	CHIEF EXECUTIVE - CONCRETE	BE (Civil)	13-Nov-96	28	50	TCE Consulting Engineer
2	B SHERDIWALA	9589332	PRESIDENT - HUMAN RESOURCES	BSc, M.A, M PHIL, LLB	19-Mar-84	29	55	NIL
3	BHARAT PAREKH	7650822	JT. PRESIDENT - CAPEX, MRO & SERVICES	BE Electronics	10-Jul-08	35	59	Aditya Birla Group
4	BURJOR DORAB NARIMAN	9228103	COMPANY SECRETARY & HEAD COMPLIANCE	BCom,FCS	14-Dec-09	38	58	Bombay Dyeing & MFG Company Ltd
5	G P TIWARI	6800674	DIRECTOR - PLANT	MSc Chemistry	9-Jul-09	29	50	Ultratech Cement
6	GEOFFREY DEAN CURRIE	11593390	DIRECTOR - OH & S	Bachelor of Business	18-Apr-11	16	44	Cement Australia
7	HANS FUCHS	16671984	MD - CONCRETE	Certificate in Mgt	19-May-08	29	47	PT Holcim Indonesia TBK(HIL)
8	J V B SASTRY	7957451	DIRECTOR - LOGISTICS	Mcom, M.Phil, MBA	24-Jun-88	33	53	Coromandel Fertilisers Ltd
9	J.DATTA GUPTA	12487531	CHIEF COMMERCIAL OFFICER	B.Tech (IIT)	10-Aug-76	37	59	NIL
10	JOYDEEP MUKHERJEE	8072684	DIRECTOR - SALES	B.A (Hons) , PGDMM, EMIB.	21-Jun-07	23	46	Hindalco
11	KULDIP K KAURA	52783462	CEO & MANAGING DIRECTOR	B.E. (Honours) in Mechanical Engineering	5-Aug-10	42	65	Vedanta Resources PLC
12	M.K. MISHRA	7781056	DIRECTOR - PLANT	BE	10-Feb-85	28	52	Lakshmi Cement
13	MARTIN MULLER	9300560	HEAD - TECHNICAL EDUCATION	Engineer HTL	1-Nov-11	34	62	Holcim Indonesia
14	P N IYER	10114638	CHIEF EXECUTIVE - SOUTH WEST REGION	BCom,PGDBA	2-Jan-09	31	57	Holcim (Bangladesh) ltd
15	R S RATHORE	8735760	DIRECTOR - PLANT	BE	26-Jul-80	35	56	Rajasthan State Minerals Development Corprn. (RSMDC)
16	RAJESH SETH	6189005	VICE PRESIDENT - CENTRAL LOGISTICS	B.Sc. (Hons.), PGDM (IIMA)	1-Jun-78	35	56	NIL
17	RAJIV KUMAR	7157190	Director Special Projects	BCom,MBA	2-Jun-89	26	50	ABC India Ltd
18	RAJIV PRASAD	20180926	CHIEF EXECUTIVE - NORTH REGION	BE, PG Diploma	27-Nov-09	28	51	Halonix Limited
19	RAJU J. MISRA	7747457	SR. VICE PRESIDENT - LEGAL SERVICES	BSc Science, BSc Shipping, LLB, PG Diploma in Security Law	7-Mar-08	26	52	ESSEL Group
20	RAKESH SINHA	7386084	DIRECTOR - PLANT	BE	24-Dec-09	31	56	The India Cement Ltd
21	S B SINGH	7274846	DIRECTOR - PLANT	MSc Chemistry, Ph. D Chemistry	3-Dec-84	32	54	Central Board for the Prevention & Control Water and Air Pollution
22	SA KHADILKAR	6839735	DIRECTOR - QUALITY & PRODUCT DEVELOPMENT	BSc , MSc Chemistry	1-Apr-81	35	57	Morarjee Mills (Piramal Organic Chemicals)
23	SHAKTI ARORA	14695330	CHIEF CENTRAL PROCUREMENT OFFICER	BE,MBA	13-Jul-09	30	52	Mahindra & Mahindra Limited
24	SUDIPTO BHATTACHARYA	6362421	VICE PRESIDENT - TAXATION & SPECIAL PROJECTS	BCom, CA	25-Jan-10	27	52	MTAR Technologies Pvt Ltd
25	SUNIL NAYAK	15263234	CHIEF FINANCIAL OFFICER	BCom, FCA, FCS, AICWA, LLB, GAMP (ISB/Kellogg)	14-Aug-08	30	53	Clariant Chemicals India Limited
26	U.V. PARLIKAR	6054159	DIRECTOR - Geocycle Business	M.Tech	1-Mar-95	30	54	National Peroxide Ltd
27	VIVEK CHAWLA	14217948	CHIEF EXECUTIVE - EAST REGION	BE Mining	3-Jan-94	32	52	Grasim Ind.Ltd

Employed for Part of the Financial Year

Sr. No.	Name	Remuneration Gross (₹)	Designation & Nature of Duties	Qualification	Date of Commencement of Employment	Total Experience (Years)	Age in years	Last Employment
1	A. K. SAXENA	1338847	PRESIDENT - WADI CEMENT CLUSTER	Diploma, BE	18-Nov-85	27	50	Lohia Starlinger Pvt Ltd
2	ATUL KHOSLA	7535737	PRESIDENT - PROJECTS	ME	18-Jul-07	30	54	Lafarge India Pvt Ltd
3	ERNESTO JR. SEGALES MATELA	1935742	DY. GENERAL MANAGER - SAFETY	BSc Civil Engineering	17-Sep-12	27	50	Holcim Ltd
4	R VASUDEVAN	5344728	SR. VICE PRESIDENT	B Tech, PG Diploma	7-Dec-77	36	60	Synthetic Foams Ltd
5	RAMIT BUDHRAJA	12777644	CHIEF EXECUTIVE - SOUTH WEST REGION	B.Tech,MBA	1-May-06	26	52	Holcim Ltd

- NOTES:- (I) Gross Remuneration shown above is subject to tax and comprises salary, allowances, incentive, monetary value of perquisites and Company's contribution to Provident Fund and Officer's Superannuation Fund and National Pension Scheme.
 (II) In addition to the above remuneration, employees are entitled to Gratuity in accordance with the Company's rules.
 (III) All the employees have adequate experience to discharge the responsibility assigned to them.
 (IV) The nature of employment in all cases is contractual.

For and on behalf of the Board of Directors