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IMPORTANCE OF CEMENT INDUSTRY IN INDIA

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Cement industry is the second most important primary and basic industry for the economic development of India, second only after iron and steel industry the cement industry is basic industry and makes an important contribution to the development of the other factory industry, to the construction and even to the development of agriculture. Cement is required by every industry cement is an important part of industrial infrastructure. It provides direct and indirect employment to a large number of persons and contributes a major part to Gross Domestic Product (GDP).

Cement is a key infrastructure industry. However, the performance of the industry and prices of cement are monitored regularly. The constraints faced by the infrastructure coordination committee meetings held in the cabinet secretariat under the chairmanship of secretary (coordination) its performance is also reviewed by the cabinet committee on infrastructure.

History of Cement

It must be interesting to know how cement is made today Vis a Vis the historical background. Ever since civilizations stepping in the earth, people sought a material that would bind stones into a solid, formed mass. The Assyrians and Babylonians used clay for this purpose, and the Egyptians advanced to the discovery of lime and gypsum mortar as a binding agent for building such structures as the pyramids. The Greeks made further improvements and finally the Romans developed cement that produced structures of remarkable durability. The secret of Roman success in making cement was traced to the mixing of slaked lime with pozzolang, a volcanic ash from Mount Vesuvius. This process produced cement capable of hardening under water. During the middle ages this art was lost and it was not until the scientific spirit of inquiry revived that we rediscovered the secret of hydraulic cement that will harden under water. Most of the building foundations in the Roman forum were constructed of a form of concrete, placed in some locations to a depth of 12 feet. The great Roman baths built about 27B.co, the coliseum, and the huge Basilica of Constantine are examples of early Roman architecture in which cement mortal was used.

Portland cement today, is a predetermined and carefully proportioned Chemical Combination of calcium, silicon, iron, and aluminum. Natural cement gave way to portland cement, which is a predictable, know product of consistently high quality. Aspdin established a plant in Wakefield to manufacture Portland cement, some of which was used in 1828 in construction of the Thames River Tunnel. But it was almost 20 years later then J.D. White and sons set up a prosperous factory in Kent

that the portland cement industry saw its greatest period of early expansion not only in England, but also in Belgium and Germany. Portland Cement was used to build the London sewer system in 1859-1867. Thomas A Edison was a pioneer in the further development of the rotary kiln. In 1902, in his Edison Portland cement works in new village, not, he introduced the first long kilns used in the industry - 150 feet long in contrast to the customary 60 to 80 feet. Today, some kilns are more than 500 feet long. Parallel improvements in crushing and grinding equipment also influenced the rapid increase in production. Since grinding process consumes most of the energy various grinding systems like ball mill/vertical roller mill Roller presses has been the result of technological developments.

Origin and development

In India cement industry has a very late start. The first cement factory of India was established in 1904 in Madras, the real beginning of the industry was in 1912-13, when three cement factories were established at Porbandar (Gujarat) Katni (M.P.) and Bundi (Rajasthan). The first world war gave the industry a great stimulus, since the demand for cement for was purposes shot up. Accordingly, its production rose from 945 tonnes only in 1914 to 84,300 tonnes in 1918. In the inter war period several new cement companies were floated which resulted in over production and price - war among them led to a large losses being incurred. Since protection was denied to the industry, the cement companies formed themselves into a cartel and established by agreement unified control over production and prices. The Indian cement manufacturers' association was formed in 1926 with a view to restricting the output and regulating the sale of cement. In 1936, Associated cement companies limited (ACC) was formed by the merger of 10 principal cement companies. This combine was threatened in 1936-37 when several. Dalmia Group factories were established with an installed capacity of 5 to 7.5 lakh tonnes a year in 1937.

In 1947, when the country was partitioned, the number of cement manufacturing factories was 23 with a capacity of 2.2 million tonnes: Five of them fell in the jurisdiction of Pakistan, the other 18 remaining with India aggregating with an annual capacity of 1.5 million tonnes. The cement manufacturing capacity increased to 3.28 million tonnes by 1950-51, when the country ushered in her planning era. During planning period, the cement industry has recorded continuous growth. India not only became self reliant at the end of seventh plan but also started export of cement. At present cement is the most advanced industries in the country. After the complete decontrol of price and distribution on March I, 1989, and introduction of other policy reforms, the cement industry has made rapid strides both in capacity/production and production process technology. As on April 30, 2003, these were 124 large cement plants with an installed capacity of 140.02, million tonnes per annum. Besides there are more than 300 min cement plants with an estimated capacity of 11.10 million tonnes per annum. The cement production during 2002-03 was 116.35 million tonnes with a growth rate of 8.84%. All restrictions on cement prices and distribution have been removed since March 1, 1989 under New Industrial Policy Resolution 1991, cement Industry has been made license free.

Export of cement was 6.92 million tonnes in 2002-03. Improvement in the quality of Indian cement has found its ready markets in Bangladesh, Indonesia, Malaysia, Nepal, Middle East Countries Burma, Africa, and South East Asian countries.

Definition of cement

Cement can be defined as any substance which can join or unite two or more pieces of some other substance together to form a unit mass; cements, as used in construction industries, is a fine powder which when mixed with water and allowed to set and harden can join different components or members together to give a mechanically strong structure. Thus, cement can be used as a bonding material for bricks or for bonding solid particles of different sizes (rubble masonry) to form a monolith.

Making of cement

Two main methods of cement manufacturing were prominent, the dry process and wet process. Dry process now has almost replaced the wet process since wet process consumes high thermal energy for drying moisture. When rock is the principal raw material, the first step after quarrying in both processes is the primary crushing Mountains of rock are fed though crushers capable of handling pieces as large as an oil drum. The first crushing reduces the rock to a maximum size of about 6 inches. The rock then goes to secondary crushers or hammer mills for reduction to about 3 inches or smaller. It is then ground in ball mill to fine powder with after ingredients like clay/iron ore/ bauxite to create a combination of values for silica / alumina / lime etc. in the mixture. If the process is wet, the grinding goes on in with water so that a slurry is resulted after grinding. This slurry further mixed in mixers and pumped to the kiln. For a dry process kiln, the ground powder is send to blending silos for uniform mixing of components added during the grinding stage. This blended material is feed to the preheater/calciner. The preheater is a group of cyclones placed over one another where in material comes down and hot gases goes up heating the material and Calcining it in the process calcination means liberating carbon-dioxide and converting calcium carbonate to calcium oxide calciner is nothing but a duct added to give more residence time to material for calcination. This partially calcined material then comes to the kiln, which is Refactory lined rotating tube having burner fitted in the other end. This burner fires (cool/oil/natural gas to create a temperature of 1600 Deg. centigrade at the discharge end, as the material in the kiln rolls down towards the discharge end, various reactions takes place amongst the components resulting in a mass, known as clinker. This clinker is then cooled in coolers. The coolers are either planetary type or grate type grate coolers of modern times are much efficient resulting in better heat recuperation and allows reusing this heat in the kiln. The cooled clinker then either goes to storage silo or clinker yard. From the clinker yard it is taken for grinding.

In case ordinary portland cement is made only gypsum (4-6%) is added before grinding. In case of portland pozzolana cement additives like flyash/brick etc. are added Grinding again is same like for raw material grinding with ball mill or with latest technologies like verical mill/ Roller press etc. The cement powder is then taken to packing plant or discharged from silo to a bulk loader directly.

Types of cement

The cements coming under the category of Portland cements are also known as "Hydraulic Cements", because they, when mixed with water have the property of setting and hardening under water. Starting with hydraulic limes, which also when mixed with water, set and harden under water, as

apposed to fat limes which do not harden under water, there are various types of Hydraulic Cements, a brief description of which is given below:

(i) Hydraulic Lime:- Early impure limestone when burnt in ordinary stack kilns and the burnt lime cooled and hydrated or slaked, gives hydraulic lime. The clay matter impurites in the limestone may be as high as 25%, but the clay matter should be very intimately disseminated in the limestone. The silica, alumina and iron-oxide present in the clay combine to some extent with the lime present in the limestone to form silicates and aluminates which impart the hydraulic properties to the product.

(ii) Natural Cement :-

Natural cement is also made by calcining impure, limestone, but the burnt material is cooled, ground and packed. There composition is more stringent than hydraulic limes and their manufacture entails better control during the process of manufacture. However use of both hydraulic limes and natural cement is now going down.

(iii) Portland Cement :-

Portland cement are made by grinding a mixture of limestone and clay matter, burning the mixture at a very high temperature cooling the resultant product, called "clinker", and grinding the same to an impalpable powder. Essential constituents are lime, silica slumina and iron oxide. Some gypsum is added during the final grinding operation. Portland cement types are divided into seven classes, as described later, but the method of manufacture of all the type is practically the same, they very only in chemical composition to impark the desired properties of a particular type.

(a) Ordinary Portland Cement (OPC):- The ordinary Portland cement is popularly known as grey cement which is produce by grinding clinker with 5% gypsum. It is used in all general concrete construction, mass and reinforced concrete. It accounts for about 70.60% of the total production.

(b) Modern Heat Portland Cement (MHPC):- By changing the chemical composition of the cement some what, the heat of hydration can be lowered, and this type of cement is called Moderate Heat cement. This type of cement is also somewhat more Sulphate resistant than OPC.

(c) Rapid Hardening Cement (RHC) or High Early Strength Cement (HESC):- As said in above, ordinary Portland Cement develops the desired strength at 3 days, 7days and 28 days; but sometimes a cement is required which should give as high a strength in 24 hours as is given by ordinary Portland Cement at 3 days, this type of cement is called Rapid Hardening Cement or High Early strength cement.

(d) Low Heat Portland Cement (LHPC):- All the above three types of cements have a fairly high heat of hydration. For large mass concrete work in dams, piers, etc., it is necessary to have a much lower heat of hydration, so chances of developing contraction cracks later are minimised. This can be done by either adding some Pozzolonic material or granulated blast furnace slag to the cement while grinding or by changing the chemical composition of the cement in such a way that the heat of hydration is reduced. Thus the chemical composition of LHC is so modified add to give a heat of hydration lower than the maximum specified.

(e) Sulphate Resisting Cement (SRC):- A Portland Cement with less than 5% C_3 A is highly resistant to sulphatic action and is known as sulphate resisting cement.

(f) Oil Well Cement (OWC):- It is made from clinker with special additives to prevent any porosity. Oil wells are drilled to depths of 4000 metres or more, and, after the drilling operation is completed, they have to be lined with an annulus made of cement concrete. The temperatures at such depths are high - 100^0C and higher.

(g) White Cement (WC):- Basically it is OPC clinker using fuel oil (instead of coal) and with iron oxide content below 0.4% to ensure whiteness. Special cooling technique is used. It is used to enhance aestheic value in tiles and for flooring white cement is much more expensive than grey cement.

(iv) Blended Portland Cement:- There are certain natural or man-made inorganic complexes which, when mixed with Portland cement clinker (or lime) and ground finely, gain cementations properties and made the resultant cement more suitable for certain jobs. These complexes are.

(a) Pozzolona (b) Slag, (c) Limestone, Sandstone, etc.

Addition of each of the above admixtures to Portland cement clinker gives a different type of cement with special properties such cements can be named Blended Portland cements. The type of blended Portland cement are as follows:-

(a) Portland Blast Furnace Slag Cement (PBFSC)

(b) Portland Pozzolana Cements (PPC)

(c) Masonry Cement (MC)

(v) Special Cements:- Some special cements, with Portland cement as base, have been developed which have very special properties and special uses. The type of special cement is as follows:-

(a) Expansive Cement or Shrinkage Compensate Cement

(b) Super high -strength cement

(c) Alinite Cement

(d) Special High C_2S Cements

(e) Water proof cement

IMPORTANCE OF CEMENT INDUSTRY

(1) **Centralization of ownership:-** In no other industry of India is there greater centralization of ownership and control than in the cement industry. The public sector, the A.C.C., the Dalmia Jain and the Birlas control bulk of the cement units. The centralization of ownership and control has inevitably led to the financial and administrative integration of different cement factories, thus exerting profound influence on the size of individual units.

(2) Diversified over the country:- The industry is well diversified over all the states of India since the manufacture of cement requires weight losing materials like limestone or chalk, clay and gypsum, the industry has a tendency to be attracted at the point of minimum transportational costs in relation to raw materials. Limestone of excellent quality exists in abundance in many parts of the country, and in close proximity of railway lines so that industry shown a tendency of regional dispersal of productive activity. But as late as 1980, Cement factories were largely concentrate in the southern and western regions of the country.

CMA ACTIVITIES

During the period (December 2003- March 2004) Cement Manufactures Association **(**CMA) Continued its effort in respect of promoting construction of cement concrete Roads in Rural and urban areas.

Highways

1. Golden Quadrilateral/ North- South and East- West corridor by NHAI:- Satara - Kolhapur NH-4 section, about 130km Long, is under construction on Golden Quadrilateral as Build, Operate and Transfer (BOT) Project. This project is having the new carriageway with concrete pavement having up to 30% replacement of cement with fly ash. This is the first major concrete pavement to use fly ash in concrete for first time in India in a length of about 60 km.

2 Maharashtra Golden triangle:- A pre- Kolhapur NH-4 Meeting was help in November 2003 by Ministry of Road Transport and Highways (MORTH) for the 7 packages identified by them to award on BOT basis construction of road section of Mumbai Nasik NH-3 is one of these packages. There after this project has been transferred to National Highway Authority of India (NHAI) for implementation. It is learnt from NHAI that after studying the tender document in reference to the pre-bid meeting, some amendment to the tender document has been issued recently and tenders will now be called for submission.

3. **Urban Roads in cement concrete Bypass at Gauriganj Uttar Pradesh:-** Uttar Pradesh Government has sanctioned the Bypass at Gauriganj Project with high volume fly ash (HVFA) concrete on equal cost basis by up Government and ACC A draft Memorandum of understanding (MOU) has been sent by ACC to Engineer in chief, PWD for approval. A meeting to finalise the MOU was likely to be held in March 2004.

After signing the MOU, ACC and PWD will take further action for construction of the road.

The concrete mix design with HVFA has been designed in laboratory by ACC limited in Mumbai and now a trial length is being laid inside plant at Takaria in March 2004 contract for construction of this road is expected to be concluded soon after signing of mole and approval of estimate by UP Govt.

4. Construction of two Roads in Municipal limits of Surat with concrete pavement:- Tenders have been invited from the prequalified contractors by the Surat Municipal corporation (SMC). It is learnt from consultants that tenders have been received by SMC and being finalised for issuing award letter.

5. Rural Road in cement concrete Pilot project under PMFSY:-

Detailed Project Reports (DPR) for the Chhattisgarh, Andhra, Pradesh, Rajasthan, Gujarat, Orissa, Punjab, Madhya Pradesh, Tamil Nadu, Maharashtra and Assam were approved by the respective State Technical Agency (STA) and submitted to National Rural Road Development (NRRDA) for approval and release of funds DPRS for Karnataka has been submitted to STA approval is awaited.

List of Uttar Pradesh Roads has been received by National council for cement and Building Materials (NCB) from NRRDA NCB is going to select 4-5 roads after site visit.

Empowerment committee Meeting in NRRDA for approval of DPRS was held in January2004. Most of the members were convinced with the cost of roads except Addl. Secretary (MORS), who was

of the view that cost of these roads is high, compared to the cost being approved for various states Director (Tech), NRRDA explained to the committee that these roads have been selected to demonstrate the performance of concrete roads in worst situations and cost of bituminous roads is generally higher in such conditions Secretary RD asked NRRDA to review the cost once again and try to reduce as much as possible. Review of cost estimates for both types of pavements made by consultants NCB in February 2004 and revised cost has been submitted to NRRDA for approval of cost and release of funds. Average cost of bitumen road per km. is about Rs. 24.9 Lakh and concrete road Rs. 31.06 Lakh i.e. 24.7% extra.

CEMENT PRODUCTION

Cement production in 2004-05 is expected to show a higher growth of six per cent as compared with 5.5 per cent increase recorded in the previous fiscal. Till October 2004, production has already grown by a healthy 6.3 per cent as compared with a 5.1 per cent increase in the corresponding period of 2003. After witnessing a poor growth till August, Production picked up in September and October, growing by 11.7 per cent and 14.12 per cent respectively.

A similar performance was demonstrated in cement consumption. Till August of the current fiscal year, consumption was up by three per cent. But in subsequent months of September and October it grew by 11.1 per cent and 17.3 per cent respectively. As a result, cumulative growth during April-October 2004 reached 6.4 per cent as compared with 4.2 per cent in the same months of 2003.

The impressing performance of cement industry in the recent months could be attributed to depressed prices and revival of construction activities in the post monsoon months. All the major zones of the country recorded healthy consumption growth in October barring the southern zone where the growth was modest 3.8 per cent. The demand has reportedly come from housing rather than infrastructure.

Cement production and consumption witnessed improvement in year on year growth in September 2004. During the month production grew by 11.5 percent as against 6.1 percent increase in September 2003. Because of this, production growth during April - September 2004 worked out to a healthy 6.1 per cent as compared to a dismal 3.6 per cent till August. This growth also compares favorably with 3.8 per cent increase recorded in the corresponding period of 2003. Cement consumption was up by 4.2 per cent in September 2004. After growing by 15.3 per cent in April, Consumption witnessed year on year decline in three of the four subsequent months. Cumulative cement consumption during April-September 2004 showed a 4.6 per cent increase, fractionally higher than the 4.4 percent growth achieved in the corresponding period of 2003.

The impressive performance of cement industry can be attributed to a consistent fall in cement prices since May 2004 and an increase in construction activities due to poor monsoon in September. Cement consumption went up in all the zones of the country in September. Exports and capacity utilisation also showed healthy growth during the month. Cement exports went up by 36 percent owing to increased demand from gulf countries.

The Indian cement industry is on a roll. Riding on increased activity in real estate, cement production has registered a growth of 7.24 per cent in April, 2005, at 11.41 million tonnes as against 10.49 million tonnes in the corresponding period a year ago.

The growth trend has been on for some time now. In the April-January 2004-05 period, the sector registered a rise of 7.1 per cent, producing 108.06 million tones. If these trends are anything to go by, it will not be long before the sector meets the production target of 133 million tonnes set by the government in the fiscal 2004-05.

During the tenth plan, the industry, which is ranked second in the world in terms of production, is expected to grow at 10 per cent/annum adding a capacity of 40-52 million tonnes, according to the annual report of the Department of Industrial Policy and Promotion (DIPP). The report reveals that this growth tried is being driven mainly by the expansion of existing plants and using more fly ash in the production of cement.

CAPACITY AND PRODUCTION OF CEMENT INDUSTRY

Cement is a key infrastructure industry. It has been decontrolled from price and distribution on 1st March, 1989 and delicensed on 25th July, 1991 However, the performance of the industry and prices of cement are monitored regularly. The constraints faced by the industry are reviewed in the Infrastructure Coordination committee meetings held in the cabinet secretariat under the chairmanship of Secretary (coordination). Its performance is also reviewed by the Cabinet committee on Infrastructure.

The cement industry comprises of 125 large cement plants with an installed capacity of 148.28 million tonnes and more than 300 mini cement plants Corporation of India, which is a Central Public Sector Undertaking, has 10 Units. There are 10 large cement plants owned by various State Governments. The total installed capacity in the country as a whole is 159.38 million tonnes. Actual cement production in 2002-03 was 116.35 million tonnes as against a production of 106.90 million tonnes in 2001-02, registering a growth rate of 8.84%.

Keeping in view the trend of growth of the industry in previous years a production target of 126 million tonnes has been fixed for the year 2003-04 during the period April-June 2003, a production (provisional) was 31.30 million tonnes. The industry has achieved a growth rate of 4.86 per cent during this period.

Exports :- Apart from meeting the entire domestic demand, the industry is also exporting cement and clinker. The export of cement during 2001-04 was 5.14 million tonnes and 6.92 million tonnes respectively. Expert during April May, 2003 was 1.35 million tonnes. Major exporters were Gujarat Ambuja Cement Ltd. and L&T Ltd.

Recommendations on Cement Industry :- For the development of the cement industry 'Working Group on Cement Industry' was constituted by the Planning Commission for the formulation of X Five year plan. The Working Group has projected a growth rate of 10% for the cement industry during the plan period and has projected creation of additional capacity of 40-62 million tones mainly through expansion of existing plants. The Working Group has indentified following thrust areas for improving demand for cement,

(i) Further push to housing development programmes;
(ii) promotion of concrete Highways and roads ; and
(iii) Use of ready-mix concrete Highways and roads ; and

Further, in order to improve global competitiveness of the Indian Cement Industry, the Department of Industrial Policy & promotion commissioned a study on the global competitiveness of the Indian Industry through an organization of international repute, viz. KPMG Consultancy Pvt. Ltd. The report submitted by the organization has made several recommendations for making the Indian Cement Industry more competitive in the international market. The recommendations are under consideration.

The export of cement during 2002-03 and 2003-04 was 6.92 million tonnes and 9.00 million tonnes, respectively. Export during April-December, 2004-05 was 7.32 million tonnes.

Growth rate of the cement industry, with 128 large and over 300 mini cement plants with estimated annual installed capacity of 151.69 million tonnes and 11.10 million tonnes, respectively, has been decelerating in recent years. However, indications for the current year suggest a better performance by the cement industry.

Given the enormous need for infrastructure and housing, which require large quantities of cement as a basic building block, the prospects of the industry are bright. This has been endorsed by market developments such as mergers and acquisitions by both domestic and international players. Keeping in view the trend of growth of the industry in previous years, a production target of 1330 lakh tonnes has been fixed for the year 2004-05. During April-December, 2004-05 the production of cement has been 962.95 lakh tonnes, which is 6.81 per cent higher than the production in the corresponding period of last year.

The impressive performance of the cement industry, both in terms of production and export, continues. Export of cement in 2003-04 and 2004-05 was 9 MT and 106 MT, respectively. During April-October 2005, exports were 5.10 MT. Installed capacity of production was augmented during 2004-05 and in view of the growth trend in the last few years, a production target of 142.0 MT was set for the year 2005-06. During the period April to October 2005, production of 82.26 MT (provisional) has already been achieved. This is 9.39 per cent higher than the production in the corresponding period of the previous year. Efforts to generate adequate domestic demand to meet the excess production capacity available with the industry are also being made.

Technological change :- Cement industry has made tremendous strides in technological up gradation and assimilation of latest technology. At present ninety three per cent of the total capacity in the industry is based on modern and environment-friendly dry process technology and only seven per cent of the capacity is based on old wet and semi-dry process technology. There is tremendous scope for waste heat recovery in cement plants and thereby reduction in emission level. One project for co-generation of power utilizing waste heat in an Indian cement plant is being implemented with Japanese assistance under Green Aid Plan. The induction of advanced technology has helped the industry immensely to conserve energy and fuel and to save materials substantially. India is also producing different varieties of cement like Ordinary Portland Cement (OPC), Portland Pozzolana Cement (PPC), Portland blast Furnace Slag Cement (PBFS), Oil Well Cement, Rapid Hardening Portland Cement, Sulphate Resisting Portland Cement, white Cement etc. Production of these varieties of cement conform to the BIS Specifications. It is worth mentioning that some cement plants have set up dedicated jetties for promoting bulk transpiration and export.

STRUCTURE OF THE INDUSTRY

Major Players

With an installed capacity of around 157 million tonnes per annum (mtpa) at end-March 2006, large cement plants accounted for 93% of the total installed capacity in India. The installed capacity is distributed over across approximately 129 large cement plants owned by around 54 companies.

The structure of the industry is fragmented, although, the concentration at the top is increasing. The fragmented structure is a result of the low entry barriers in the post decontrol period and the ready availability of technology. However, cement plants are capital intensive and require a capital investment of over Rs. 3,500 per tonne of cement, which translates into an investment of Rs. 3,500 million for a 1 mtpa plant.

The cement industry has witnessed substantial reorganisation of capacities during the last couple of years. Some examples of the consolidation witnessed during the recent past include: Gujarat Ambuja taking a stake of 14% in ACC; Gujarat Ambuja taking over DLF Cements and Modi Cement; India Cement taking over Raasi Cement and Sri Vishnu Cement; Grasim's acquisition of the cement business of L&T; Indian Rayon's cement division merging with Grasim; Grasim taking over Sri Digvijay Cements; L&T taking over Narmada Cements; ACC taking over IDCOL.

Multinational cement companies have also initiated the acquisition process in the Indian cement market. Swiss cement major Holcim has picked up 14.8% of the promoters stake in Gujarat Ambuja Cements (GACL). In January 2006, Holderind Investments (Holcim Mauritius), an indirect, wholly-owned subsidiary of Holcim, acquired 200 million equity shares of GACL at a price of Rs.105 per share from the promoters. Post-sale, the share of promoters in the company is 9%. Holcim also made an open offer to acquire an additional 20% stake in GACL at Rs. 90.64 per share. Earlier, Holcim had entered into a strategic alliance with GACL, and acquired a 67% controlling stake in Ambuja Cement India. Through this holding company, Holcim acquired a majority in Ambuja Cement Eastern and a substantial stake in ACC. Ambuja Cement India holds a 34% share in ACC and a 97% share in Ambuja Cement Eastern. Holcim's acquisition has led to the emergence of two major groups in the Indian cement industry, the Holcim-ACC-Gujarat Ambuja Cements combine (capacity of 33.5 mt) and the Aditya Birla group through Grasim Industries and Ultratech Cement (combined capacity of 31.1 mt). Lafarge, the French cement major, had acquired the cement plants of Raymond and TISCO in the recent past, and has an installed capacity of 5 mtpa. Italy based Italcementi has acquired a stake in the K.K. Birla promoted Zuari Industries' cement plant in AP, with a capacity of 3.4 mtpa. Recently, Heidelberg Cement has entered into an equal joint-venture agreement with S P Lohia Group controlled Indo-Rama Cement. Heidelberg Cement is expected to take a 50% controlling stake in Indo-Rama's grinding plant of 0.75 mtpa at Raigad in Maharashtra.

As on March 2006, ACC was the largest player with a capacity of 18.64 mtpa. UltraTech Cement Co Ltd. now occupies the second slot with a capacity of 17 mtpa (which includes 1.5 mtpa of subsidiary Narmada Cement). The Gujarat Ambuja group has emerged as the third largest player with a capacity of 14.86 mtpa. Grasim ranks fourth with a capacity of 14.12 mtpa. Other leading players include India Cements, Jaypee group, Century Textiles, Madras Cements, Lafarge, and Birla Corp. The relative market share of large players in the cement industry has changed significantly over the years.

Consolidation of capacities has seen UltraTech, Grasim, India Cement and Gujarat Ambuja emerge as the leading players apart from ACC, which has been the market leader during all the years excepting FY2001. All the players have resorted to a combination of greenfield capacities as well as takeover of existing capacities for growth.

Declining Role of Public Sector

Historically, cement has been one of the most important areas of operations for the Indian private sector. Unlike much of heavy industry and utilities, cement was not deemed to be the exclusive preserve of the State sector in the post-independence development strategy. Cement was also the industry of choice of many corporates diversifying away from the troubled traditional areas of jute and textiles.

Over the years, the share of the public sector in cement production has declined. While the private sector (large companies) accounts for around 95% of the total installed capacity, the share of public sector companies has declined from a level of 11% in FY1996 to around 4.4% in FY2006. The share in production of the public sector companies is even lower at 1.2% in FY2006 as compared to 6.5% in FY1996.

Among cement public sector undertakings (PSUs), Cement Corporation of India (CCI), a central PSU, is the leading player. It has 10 cement plants with a total installed capacity of 3.85 mtpa at end-FY2006. Other PSU companies manufacturing cement include State entities such as UP State Cement Corporation (3 units with total capacity of 2.16 mtpa); and Tamil Nadu Cement (2 plants with a total capacity of 0.9 mtpa).

Given the extent of losses being incurred by most of these plants, restructuring and revival through privatisation appears imminent. Accordingly, the Yerraguntla unit in Andhra Pradesh, which belonged to CCI, was taken over by India Cements in FY1998. The three units of UP State Cement Corporation have been closed since early 1998. These units were taken over by Jaypee Group in FY2006.

SCALE OF OPERATIONS

As of end-FY2006, there were 7 plants with a capacity exceeding 3 mtpa at a single location, and 71 plants with a capacity exceeding 1 mtpa at a single location. Plants with a capacity exceeding 1 mtpa at a single location had a cumulative installed capacity of 126.2 mtpa at end-FY2006, accounting for 80.3% of total installed capacity.

Importance to Economy

India is the second largest producer of cement in the world. In 2005, India produced 142 mt of cement, accounting for 6.4% of global production of 2.22 billion tonnes. India is the second largest producer-behind China (1,000 mt), but ahead of the US (99 mt) and Japan (66 mt). India's cement industry-both installed capacity

and actual production-has grown significantly over the past three decades, with production increasing at an average rate of 8.1% per year between 1981 and 2004-05.

In recent years, the cement sector has accounted for a declining share of gross bank credit (GBC) of scheduled commercial banks (SCBs), largely because of decline in credit during FY2004. With GBC of Rs. 61.12 billion in March 2005, the cement industry accounted for 1.67% of industry GBC of SCBs in March 2005, as compared with 1.81% in March 2000.

DEMAND-SUPPLY POSITION

Robust Production Growth

India's cement production increased 11.2% during FY2006 to 141.81 mt. By comparison, production increased 8.6% during FY2005, and 5.5% during FY2004. Production has increased at a 3-year compound annual growth rate (CAGR) of 8.4%. On a decadal basis, India's cement production increased at an annual average of 8.2% during FY1996-2006, as compared with 6.9% during FY1986-96.

During FY2006, after the slack of the monsoon season, cement production registered high growth since October 2005. High growth in the cement sector reflected robust demand from the construction sector and high exports.

Cement production and consumption has strong co-relation with economic growth and industrial activity.

As cement is a basic construction material with virtually no substitute, it is used worldwide for all construction work. Thus, the growth in the construction industry has a direct relation with the production and consumption of cement. GDP from the construction industry has grown at a high rate over the last three years-12.1% during FY2006, 12.5% during FY2005, and 10.9% during FY2004. This has had a positive impact on cement consumption, which increased 10.1% during FY2006, as compared with 8.1% during FY2005.

The increased growth in cement consumption since 2004 has had a positive impact of the capacity utilisation of cement producers. Capacity utilisation increased from 76% in FY2002 to around 90% in FY2006.

Low but Rising Share of Blended Cement in India

In India, about 44% of the cement produced is Ordinary Portland Cement (OPC), 47% is Pozzolana Cement (PPC), 8% is Portland Blast Furnace Slag Cement (PBFS), and the remaining 1% are special cements. Blended cement (PPC and PBFS) has a low but rising share of India's cement production. Energy usage is significantly lower in blended cement because a portion of the clinker is replaced by other materials such as fly ash or blast furnace slag. Blended cements are composite cements produced by blending clinker -which is the output of the kiln- at the grinding stage with pozzolonic or other material with cement like properties. Although compressive strength of the major types of blended cement is equivalent to that of Grade 33 OPC cement; blended cement offers a reduction in the risk of thermal cracking; superior performance under elevated temperature curing conditions; good long-term strength; higher resistance to acids, sulphates and alkali attacks, with more suitability for coastal areas; reduced permeability with consequent improvement in durability; smoother finishing, etc.

In India, the share of blended cement in the total production had increased from 47% in 1978-79 to 76% in 1982-83. After this, the Indian cement industry witnessed a higher production of the higher grade OPC, and the production of blended cement gradually declined to 27% in 1992-93. However, this was followed by an upward trend, and the share of blended cement reached approximately 56% in 2004-05.

Regional Production Patterns

The Indian cement industry is comprised of 129 large cement plants and 300 mini-cement plants, with installed capacities of 153.6 mtpa and 11.10 mtpa, respectively at end-FY2005. The proximity of coal deposits constitutes another important factor in cement manufacturing. Nearly 68% of the coal required by the cement industry during FY2005 was transported by rail; the balance 32% was moved by road.

There are at present seven clusters-Satna (Madhya Pradesh), Chandrapur (North Andhra Pradesh and Maharashtra), Gulbarga (North Karnataka and East AP), Chanderia (South Rajasthan + Jawad & Neemuch in MP), Bilaspur (Chattisgarh), Yerraguntla (South AP), and Nalgonda (Central AP)-with a total capacity of 75.23 mtpa at end-March 2005, accounting for 48.4% of the total installed capacity.

AP is the largest cement producing state with an installed capacity of 24.9 mt. Cement production during FY2006 was 19.9 mt. Other major cement producing states include Rajasthan, Madhya Pradesh, and Gujarat.

In terms of regional concentration, the Southern region accounts for 32% of installed capacity, followed by Western region. MP is traditionally considered a part of the Western region although as much as 65% of cement output from this state serves the Northern and Eastern regions.

Major Players

As discussed, ACC is the largest player with a capacity of 18.64 mtpa at end-March 2006. UltraTech CemCo Ltd. now occupies the second slot with a capacity of 17 mtpa (which includes 1.5 mtpa of subsidiary Narmada Cement). The Gujarat Ambuja group has emerged as the third largest player with a capacity of 14.86 mtpa.

Grasim ranks fourth with a capacity of 14.12 mtpa. Other leading players include India Cements, Jaypee group, Century Textiles, Madras Cements, Lafarge, and Birla Corp.

High Growth in Domestic Cement Consumption

India's cement consumption increased 10.1% during FY2006 to 135.56 mt. By comparison, consumption 8.1% during FY2005, and 5.8% during FY2004. Production has increased at a 3-year compound annual growth rate (CAGR) of 8%.

On a decadal basis, India's cement consumption has increased at a 10-year CAGR of 8.2% during FY1996-06. Demand has largely been driven by a shift in housing construction preferences to concrete and the rapidly rising population. The healthy growth beginning in FY2005 is also due to increased demand from National Highway Development Projects (NHDP).

In India, the percentage of pucca houses in urban areas increased from 73% in 1991 to 75% in 2001, whereas the percentage of semi-pucca and kutcha houses in the urban areas has declined. The percentage of pucca houses in rural areas increased from 31% in 1991 to 35% in 2001. This implies that use of permanent building materials for the construction of walls and roofs is becoming more popular in

rural areas also. Data from the 58th Round of Survey by National Sample Survey Organisation (NSSO) indicates that the percentage of pucca dwellings in urban areas increased from 74% in 1993 to around 77% in 2002-03. Over the same period, the percentage of pucca dwellings in rural areas increased from 32% to 36%.

Housing completions in urban areas in each decade has shown an increasing trend from 11.55 million in 1971-81 to 19.53 million in 1991-2001. Similarly, housing completions in rural areas has also increased from 19.16 million to 25.61 million. Apart from increased preference for pucca constructions, housing size has also increased in urban areas. Overall, while the share of 1-room houses has declined from 45% in 1981 to 39% in 2001, the share of 3-or more rooms has increased from 27% to 32%.

In India, cement consumption and sales follows a seasonal pattern with lean sales during the monsoon season (July-September) and higher sales during October-March. In terms of regional consumption, the Southern region accounted for 29% of the total consumption of approximately 135.6 mt during FY2006, followed by Northern and Western regions. Although, there has been an year to year variation in the region-wise consumption growth rates, the relative shares of each region has more or less remain stable across the past few years.

Regional disparity has been witnessed in the consumption growth. During FY2006, the Southern region witnessed the strongest consumption growth, driven by higher construction activities from both Government and private sector projects. By comparison, while consumption in Western region increased 5.4% during FY2006, consumption in Central region increased only 0.8%.

The major consumption states for cement in India include Maharashtra (16.8 mt in FY2006), UP (14.2 mt), Andhra Pradesh (11.5 mt), and Tamil Nadu (11.1 mt). Over the last three years, consumption growth has outpaced the national average in Andhra Pradesh, Haryana, Rajasthan, and Karnataka.

Exports

The Indian cement industry exported around 6 mt of cement during FY2006, accounting for around 4% of the total production. There has been a significant year on year variation in the export trend, implying that Companies rely on cement exports to balance out the domestic demand supply situation. Because of increased overseas demand, cement exports increased from 4.07 mt in FY2005 to 6.01 mt during FY2006. However, increased domestic demand resulted in clinker exports declining from 5.99 mt to 3.18 mt.

As cement is a low value, high bulk commodity, freight cost becomes a significant factor in determining the landed cost of cement. This has resulted in a very low volume of international trade in cement. World cement trade has averaged just around 6-7% of the total production.

The export performance of Indian Cement industry has been healthy in recent years and has witnessed growth at a CAGR of 20.1% during FY2004-06. During FY2006, cement exports were higher by 47.7%. There has been a significant year on year variation in the export trend, implying that companies rely on cement exports to balance out the domestic demand supply situation.

Demand-Supply Position

Overview

The cement industry has been in a surplus position since a long time. This has resulted in increased exports over the last few years. Although there exists a surplus of cement in the country, the surplus has declined from 0.42 mt in FY2005 to 0.23 mt during FY2006, mainly because of higher growth in consumption. This has resulted in capacity utilisation increasing from 84% in FY2005 to 90% in FY2006.

India's annual per capita cement production of 0.13 tonnes in FY2006 is significantly below the world average of 0.3 tonnes and China's production of 0.76 tonnes during 2004. It has been observed that cement consumption increases along with the rise in per capita income in developing countries.

As per present expansion plans, an additional 6.6 mtpa of capacity is expected to be operational in FY2007. Considering an expected production and consumption growth of 10% during FY2007, the demand supply position of the Indian cement industry is expected to improve.

Regional Position

There exist regional surplus/shortages in the Indian cement industry. The table-10 details the region-wise production and consumption of cement.

As can be seen from the table, South India leads in both cement production and consumption. While demand in the eastern region is primarily driven by the housing sector; infrastructure, investments in industrial projects and the housing sector (in varying proportions) have propelled demand in the western, northern and southern regions. The oversupply is largely in the Southern and Northern regions. By contrast, there is a supply shortage in Eastern and Western regions.

PRICES

The regional variations in the Indian market has resulted in the cement prices across regions witnessing movement within a band, with no appreciable increase in any region. Differences in regional demand supply situation has translated into price differences across regions. Prices are lower in Southern regions where there is normally a supply surplus. However, prices are higher in Eastern and Western regions where shortages exist.

The surplus position had resulted in significant pressure on price realisations in recent years. The cyclical trough in the late-1990s had a severe impact on the industry financials and many companies were referred to BIFR. However, cement prices have firmed up during the last few years due to improvement in demand-supply position and increasing consolidation in the industry. The Wholesale Price Index (WPI) for cement increased 3.9% during FY2005, as compared with a growth of 1.2% during FY2004. The WPI for March 2006 was 11% higher than the WPI for March 2005.

NEW/EXPANSION PROJECTS

- During FY2007, ACC plans to expand capacity at its Rajasthan plant from 0.6 mtpa to 1.6 mtpa at a cost of Rs. 4 billion. It is also expected to invest in expansion of grinding capacities at various plants. With these brownfield expansions, the company's installed capacity is expected to increase by around 2 mtpa in FY2007.

- Grasim Industries is planning to expand capacity by 8 mtpa in both greenfield and brownfield projects in Rajasthan at an estimated cost of Rs. 24.75 billion.
- Madras Cements is planning to set up a 2 mtpa greenfield unit in TN at a cost of Rs. 6.12 billion, and an additional clinker facility at its existing plant in AP at a cost of Rs. 4.39 billion. The clinker facility is expected to result in increase in cement production capacity at its AP unit from 1.6 mtpa to 3.6 mtpa. The new unit

and the clinker facility are expected to be operational during Q4FY2008 and Q2FY2008, respectively.

- India Cements plans to set up a 2 mtpa plant in HP at a cost of Rs. 7.5 billion. The plant is expected to be operational in 2010-11. India Cement is also expanding capacity at its existing plants by 2 mtpa.
- Shree Cement plans to set up a new 1.5 mtpa plant at Rajasthan at an approximate cost of Rs. 4 billion. The plant is expected to be operational by FY2008.
- OCL India plans to increase its capacity by 2.4 mtpa at its existing plant in Orissa at an investment of Rs.7 billion. The project is expected to be commissioned by September 2009.
- Gujarat Ambuja group company-Ambuja Cement Eastern-is expanding capacity at its clinker unit in Sankrail, West Bengal at an investment of Rs. 8 billion. It is also setting up a greenfield plant in West Bengal. Post-completion by end-FY2007, the company's installed capacity is expected to increase from 2 mtpa to 3 mtpa.
- Heidelberg Cement plans to expand its capacity to 5-10 mtpa over the next three years.
- Lafarge is planning to expand capacity by 2 mtpa at its Sonadih plant in Chattisgarh.
- Binani Cement plans to increase capacity by 2 mtpa at its cement plant in Sirohi, Rajasthan.
- The Jaypee group plans to invest Rs. 30 billion by 2007 to increase capacity from 6.5 mtpa to 15 mtpa.

OUTLOOK

The cement sector is expected to witness strong production and consumption growth of 10% during FY2007 in line with the economic growth because of the strong co-relation with GDP and the increased activity in the construction sector. Future drivers of cement demand growth in India would be increased spending on road and housing projects. The Union Budget for FY2007 has provided further thrust to the infrastructure sector through several initiatives, such as:

- Budget support on the National Highways Development Programme (NHDP) increased from Rs. 93.20 billion in 2005-06 to Rs. 99.45 billion in 2006-07. The NHDP envisages an investment of Rs. 2,200 billion on concessions/contracts to be awarded by 2012;
- Special accelerated road development programme for the North Eastern region at an estimated cost of Rs.46.18 billion has been approved. The Government has also decided to develop 1,000 kms of access controlled Expressways.
- 'Bharat Nirman' to focus on 6 components of rural infrastructure including irrigation, roads, water supply, housing, rural electrification and rural telecom connectivity.
- Outlay on `Bharat Nirman' increased from Rs. 121.60 billion to Rs. 186.96 billion.

- Increase in outlay from Rs. 45 billion to Rs. 71.21 billion with the objective of improving the pace of implementation of irrigation projects.

The housing sector, which accounts for around 55-60% of total demand, is likely to continue to be the driving force behind cement demand. It is estimated that requirement of new dwelling units over a period of 25 years (1996-97 to 2020-21) will be around 140 million units requiring an investment of approximately Rs. 20,000 billion. Besides demand from infrastructure projects and industrial/commercial ventures account for 20% each. Even as NHDP-I (comprising the Golden Quadrilateral or GQ and North-East-South-West or NESW) near completion (GQ by end-2006, and NESW by 2009), demand in the port and airport segments may pick up, keeping demand buoyant. Further, NHDP-III to NHDP-VII (2006-15) envisages construction of another 36,000 kms of roads at an estimated cost of Rs. 1,270 billion.

Overall, from the demand perspective, the fundamentals look bright, and cement demand in the medium term is expected to grow by around 9%. The Planning Commission's Working Group on Cement Industry predicts cement production in India to grow at a rate of 10% during the Tenth Five-Year Plan (2002-2007). By comparison, the cement industry is expected to grow at around 8-10% during the 2003-07 period. Growth of 9% per annum from FY2006-10 would result in cement production increasing to around 196 mt in FY2010. By comparison, consumption could increase to 190 mt in FY2010. China, the world's largest producer of cement, has seen sustained cement production average annual growth of 10% since 1980, mostly due to the enormous infrastructure development that country has experienced over this period.

Conclusion

Cement is key factor in economic development. The industry has tremendous potential for development a limestone of excellent quality is found almost throughout the country.

The major problem faced by the cement industry in recent years, as indicated already, were inadequate and erratic supply of coal mainly due to poor availability of rail wagons, increase in coal prices following partial deregulation, poor quality of coal and frequent power cuts in major. Cement producing states like Rajasthan, Andhra Pradesh, Karnataka, Madhya Pradesh Gujarat and Kerala.

We may also refer, in this connection, to the ambitious modernisation/expansion programmes of the cement industry which include conversion of manufacturing process, energy conservation of measures adoption of latest technologies such as pre-heaters and pre-calcinators, installation pollution control devices, setting up of captive power units, etc. The Government is also encouraging the setting up of coal washeries and captive power plants to solve the problems of poor quality of coal and power shortage. A very interesting pilot project for transportation of bulk cement is being set up at Kalamboli New Bombay in order to switch over gradually from the traditional movement of cement in bags to modern and efficient mode of transportation and distribution in bulk.

Annexure

Table. 1 Cement Statistics: Production, Consumption and Prices

Month	Prodn. (Lakh tonnes)	Prodn. (% chg.)	Consumption (Lakh tonnes)	Consumption (% chg.)	Prices* (Rs./50kg)	Prices* (% chg.)
Oct. 2003	94.20	6.24	87.34	2.73	156	9.47
Nov. 2003	91.80	3.85	89.40	4.78	160	-3.03
Dec. 2003	100.70	4.96	96.30	5.15	165	0.92
Jan. 2004	102.40	7.09	99.68	7.30	173	6.46
Feb. 2004	103.40	10.96	100.09	11.65	172	5.85
Mar. 2004	112.60	3.52	109.92	5.99	176	7.01
Apr. 2004	106.40	17.31	100.49	15.27	174	5.45
May. 2004	104.50	-1.61	99.44	-4.46	175	6.06
Jun. 2004	98.00	-4.11	96.26	-2.37	174	10.48
Jul. 2004	102.70	9.02	97.02	8.57	172	10.65
Aug. 2004	88.54	1.19	84.61	-0.12	170	11.48
Sep. 2004	98.40	11.69	96.87	11.15	167	11.33
Oct. 2004	107.50	14.12	102.47	17.32		
	Apr-Oct	Apr-Oct	Apr-Oct	Apr-Oct	Apr-Set	Apr-Set
2003-04	664.10	5.09	638.42	4.20	158	5.94
2004-05	706.00	6.31	679.35	6.41	172	9.15
	Apr-Mar	Apr-Mar	Apr-Mar	Apr-Mar	Apr-Mar	Apr-Mar
2003-04	1174.40	5.47	1137.92	5.77	162	5.10

*Wholesale prices in the Mumbai Market.

Source: CMIE DEC- 2004

Table – 2 Production of cement

Year	Production (in lakh tonnes)	Growth rate
1999-2000	982	11.72
2000-01	976	(-) 0.61
2001-02	1069	9.52
2002-03	1164	8.88
2003-04	1235	6.09

Source : Department of Industrial policy and Promotion.

Table – 3 Production of cement

Year	Production (in lakh tonnes)	Growth rate (in per cent)
2000-01	976.10	(-) 0.61
2001-02	1069.00	9.52
2002-03	1163.50	8.84
2003-04	1235.00	6.15
2004-05	1335.70	8.15

Source : Department of Industrial policy and Promotion.

Table -4 Highlights of Indian Cement Industry

As on 31st March, 2006

Large Plants (Large Plants means capacity more than 0.198 Mn T. per annum)	
Companies (Members) (Nos.)	52
Cement Plants (Nos.)	130
Installed Capacity (Mn.t.)	160.24
Cement Production (Mn.t.) 2005-06	141.81
Plants with Capacity of Million tonnes and above (Nos.)	76
Manpower Employed (Nos.) Approx.	1,35,000
Turnover in 2005 (Mn. US$) around	9,700

Mini Plants (Mini Plants means capacity less than 0.198 Mn. T. per annum)	
Cement Plants (Nos.)	365
Installed Capacity (Mn.t.)	11.10
Cement Production (Mn.t.) 2005-06	6.00(P)

Table -5. Market Share of Leading Cement Producers

FY	2001	2002	2003	2004	2005	2006
The Associated Cement Companies Limited	11.2%	12.2%	12.8%	13.5%	13.0%	12.6%
UltraTech CemCo Ltd.	11.9%	11.1%	10.5%	10.1%	10.1%	9.7%
Gujarat Ambuja Cements Limited	10.6%	8.7%	9.5%	10.1%	11.3%	10.6%
Grasim Industries Limited.	9.2%	10.3%	10.9%	10.9%	10.3%	10.3%
Century Textiles and Industries Limited	5.4%	5.0%	4.8%	4.8%	4.8%	4.7%
Birla Corp Limited	4.2%	4.0%	4.1%	4.1%	3.9%	3.6%
The India Cements Limited	7.3%	5.8%	5.4%	5.4%	5.1%	5.9%
Jaiprakash Industries Limited	2.3%	3.9%	3.8%	3.6%	4.3%	4.5%
Lafarge	3.8%	3.8%	3.4%	3.2%	3.4%	3.2%
Others	34.1%	35.2%	34.8%	34.3%	33.7%	34.8%
Total	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**

Table - 6 Regional Distribution of Capacity and Production

	Million tonnes			Share of total		
FY	2004	2005	2006	2004	2005	2006
Capacity	**144.30**	**151.34**	**157.15**	**100**	**100**	**100**
North	25.97	27.36	27.36	18.0	18.1	18.8
East	22.38	22.81	22.85	15.5	15.1	14.5
South	46.27	48.06	50.76	32.1	31.8	32.3
West	27.98	28.92	28.94	19.4	19.1	18.4
Central	21.70	24.20	25.00	15.0	16.0	15.9
Production	**117.50**	**127.57**	**141.81**	**100**	**100**	**100**
North	25.22	26.70	30.17	21.5	20.9	21.3
East	16.67	18.73	19.54	14.2	14.7	13.8
South	36.13	38.98	44.88	30.8	30.6	31.7
West	21.00	22.76	24.93	17.9	17.8	17.6
Central	18.48	20.39	22.28	15.7	16.0	15.7

Table - 7 Major Players in Indian Cement Industry

Thousand tonnes

	FY2005		FY2006	
	Installed Capacity	**Production**	**Installed Capacity**	**Production**
ACC	18,228	16,606	18,640	17,902
Gujarat Ambuja	14,570	14,467	14,860	15,094
Ultratech	17,000	12,921	17,000	13,707
Grasim	14,115	13,143	14,115	14,649
India Cements	8,810	6,506	8,810	8,434
JK Group	6,415	5,769	6,680	6,174
Jaypee Group	5,600	5,429	6,531	6,316
Century Textiles	5,900	6,070	6,300	6,636
Madras Cements	5,470	3,663	5,470	4,550
Birla Corp.	4,780	5,017	5,113	5,150
Lafarge	5,000	4,391	5,000	4,573
Others	45,456	33,589	48,627	38,620
Total	**151,344**	**127,571**	**157,146**	**141,805**

Table - 8 Housing Stock in India

Million units

	1981		1991		2001	
	Units	**% of total**	**Units**	**% of total**	**Units**	**% of total**
Urban	27.20	100	39.40	100	52.06	100
Pucca	17.60	64.7	28.66	72.7	38.89	74.8
Semi-Pucca	5.93	21.8	6.97	17.7	9.49	18.2
Kutcha	3.67	13.5	3.77	9.6	3.68	7.0
Rural	**87.20**	**100**	**109.00**	**100**	**135.10**	**100**
Pucca	19.65	22.5	33.34	30.6	47.78	35.4
Semi-Pucca	32.20	36.9	38.86	35.6	49.65	36.7
Kutcha	35.35	40.5	36.80	33.8	37.67	27.9
Total	**114.40**	**100**	**148.40**	**100**	**187.16**	**100**
Pucca	37.25	32.6	62.00	41.8	86.67	46.3
Semi-Pucca	38.13	33.3	45.83	30.9	59.14	31.6
Kutcha	39.02	34.1	40.57	27.3	41.35	22.1

Table -.9 Regional Distribution of Cement Consumption

	Million tonnes			Share of total		
FY	**2004**	**2005**	**2006**	**2004**	**2005**	**2006**
North	22.86	24.26	27.06	20.1	19.7	20.0
East	17.48	20.40	22.66	15.3	16.6	16.7
South	32.03	33.43	39.37	28.1	27.2	29.0
West	22.52	24.59	25.91	19.8	20.0	19.1
Central	18.97	20.41	20.57	16.7	16.6	15.2
Total	**113.86**	**123.08**	**135.56**	**100**	**100**	**100**

Table -10 Regional Capacity, Production, and Consumption of Cement

mt

	FY2006				FY2005			
	Capacity	Production	Consn.	Supply Surplus	Capacity	Production	Consn.	Supply Surplus
North	29.59	30.17	27.06	3.11	27.36	26.70	24.26	2.44
East	22.85	19.54	22.66	-3.12	22.81	18.73	20.40	-1.67
South	50.76	44.88	39.37	5.51	48.06	38.98	33.43	5.55
West	28.94	24.93	25.91	-0.98	28.92	22.76	24.59	-1.83
Central	25.00	22.28	20.57	1.71	24.20	20.39	20.41	-0.02
Total	**157.15**	**141.81**	**135.56**	**6.25**	**151.34**	**127.57**	**123.08**	**4.49**

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