ENHANCING THE "BOTTOM-LINE" IN PRODUCTION AND SALES

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About the Author

An Engineer-MBA by qualification, Mr Karkun has been associated with the cement industry for the last 27 years in an operations as well as consulting capacity. He has led over 250 multi-functional consulting assignments for 50 clients in 20 countries. These assignments have spanned areas as diverse as investment appraisal, plant operations, marketing, human resources, finance, information systems and strategic planning. In addition, Mr Karkun has also led a variety of training related initiatives including institutional building, courseware development and teaching. Mr Karkun's primary expertise is in delivering holistically integrated consulting solutions that preclude functional sub-optimization.

Synopsis of Paper

The Indian Cement Industry, the second largest in the world, is in the grip of a wide-sweeping environmental change. Over capacity, slackening of demand growth, see-sawing prices, industry consolidation, the charge of the Global Giants, the threat of cheaper imports - it's all happening! Success, and even survival, depends on how nimbly organizations prepare themselves to cope.

Manufacturers, ostensibly, have limited individual control on variables dominated by the external environment. **Thus, an enhanced, continuing focus on internally controllable variables becomes an absolute imperative to even maintain a black bottom-line.**

Realizing this need for continuous improvement, most companies have initiated focused programs covering various aspects of cement operations. While such a focus has yielded moderate to good results, an analysis of these clearly reveal some shortcomings. Drawing on actual industry data encountered through consulting experiences, the author suggests **an innovative and structured approach** that addresses the current shortcomings, and significantly value-adds to these initiatives.

A Case Study is presented at the end of this paper that highlights the outcomes achieved through the simultaneous application of the different features of the proposed approach.

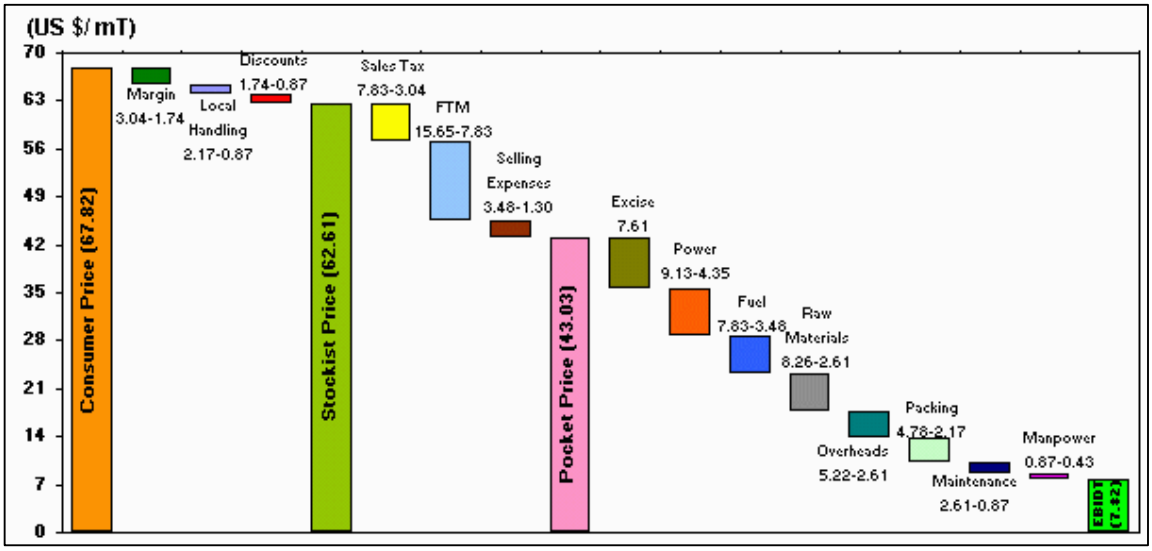
Preamble

The Indian Cement Industry is in the grip of a wide-sweeping environmental change. Slackening of demand growth, industry consolidation, the charge of the MNC's, it's all happening! Success, and even survival, depends on how nimbly organizations organize themselves to cope. A snapshot of the current industry status is attached as **Annexure 1**.

While manufacturers, ostensibly, have minimal individual control on variables dominated by the external environment, an enhanced focus on internally controllable variables is an absolute imperative. Improved bottom-line management is one such initiative. Holtec has taken a lead in facilitating such client-sponsored initiatives through innovative application of its multi-functional expertise.

Current Status of the Waterfall

Compilation of recent data, collected for about 63 representative companies/ plants in the Indian Cement Industry, portrays the following status of the elements constituting the bottom-line waterfall.



An analysis of the waterfall diagram, as shown in the following table, reveals that about 8 items fall in the A category (approx. 80% cumulative), 2 items in the B category (between approx. 80-90% cumulative) and 4 items in the C category (between approx. 90-100% cumulative):

Head	US $/ mT	%	Cumulative %
Freight to Market	11.75	19.58	19.58
Excise (Production Tax)	7.61	12.68	32.27
Power	6.74	11.23	43.50
Fuel	5.65	9.42	52.92
Raw Materials	5.43	9.05	61.97
Sales Tax	5.43	9.05	71.02
Overheads	3.91	6.52	77.53
Packing	3.48	5.80	83.33
Channel Margins	2.40	4.00	87.33
Selling Expenses	2.39	3.98	91.32
Maintenance	1.74	2.90	94.22
Local Handling	1.52	2.53	96.75
Channel Discount	1.30	2.17	98.92
Manpower	0.65	1.08	**100.00**
Total	**60.00**	**100.00**	

Discussions with various producers, regarding the measures invoked by them, throw up a plethora of conclusions. A few significant ones are reproduced below:

- Without undermining the importance of cost conservation related to energy, there seems to be an over-concentration on effecting marginal savings. The efforts, both in terms of the man-hours and the capex expended, seem to be out of proportion to the

incremental benefits achieved. This is so, since many units have already reached fairly optimum levels of energy performance.

- Sub-optimization seems to be a recurring problem. For example, while conserving raw material costs in taking raw mix decisions, the impact of such decisions on fuel consumption (due to varying heats of formation of different mixes) or power consumption in finish grinding (due to varying clinker properties) is often not explicitly assessed.
- Local innovations (as different from those effected by technology/ equipment suppliers) in cost conservation have generally been restricted to the area of maintenance where the focus has been on restricting consumption rates. Most other initiatives have followed a beaten track.
- Significant attention has not been paid to the most cost intensive item viz., Freight to Market. Neither have optimization tools been adequately used, nor have measures such as reducing the fleet queue length been suitably researched, in order to provide an incentive to the transport contractor to reduce freight rates.
- Overheads, responsible for over 6.5% of the total cost have not been investigated in detail. Included in this are items such as inventory carrying costs, which could possibly be subjected to significant reduction.
- About 50% of the units, for which data was collected, have still to launch focused initiatives to reduce the impact of sales tax. Given the differential rates prevalent in different geographic areas, significant benefits could be effected through dump relocation, sales redistribution, etc.
- The concentration has been on improving physical parameters of performance rather than its money value. Consequently, the improvement potential from rate reduction remains largely untapped.
- Supply chain management continues to languish as a bit of a buzzword instead of a hard-core, application-oriented technique. Most units believe that they are doing a good job of supply chain management even without considering the complete integrated nature of the process chain.
- Performance benchmarking has still to come of age! Most companies and plants appear to be a little over-obsessive (turf defense?) about conditions peculiar to their environment. The attitude is often about "why something cannot be done". The role of the marketplace, as a great equalizer is, more often than not, ignored.
- Finally, cost reduction by itself does not lead to an improvement of the bottom-line. In most organizations, even the ones fairly progressive, bottom-line enhancements through a combination of revenue increase and cost decrease is hardly ever a single point responsibility. Thus, benefits possible from reviewing decisions related to the product mix, customer mix, market mix, etc. have not been fully realized.

Managing the Waterfall

Realizing the need for continuous improvement as a means of retaining a competitive edge, most cement companies have initiated ongoing programs, covering various aspects of cement operations. This focus on continuous improvement has yielded fairly good results, with a number of key performance indicators showing improvement. However, a structured approach, that tries to address the issues previously mentioned, can significantly complement these continuous improvement initiatives. The key features of this approach are listed below:

- Ensuring an integrated coverage, thus eliminating the phenomenon of sub-optimization.
- Focus on bottom line results in which, apart from physical parameters, possible reductions in input rates are also sought.

- Exploration of non-conventional areas that are normally not addressed.
- Value addition to on-going initiatives in terms of time saving, cost saving and improved target setting.
- Usage of optimization tools to achieve superior solutions.
- Structuring the improvement initiative through a three-step approach consisting of Assessment, Action and Monitoring.

Integrated Coverage

Integration can only be ensured, if the entire supply chain is included in the scope of coverage. For those, yet unfamiliar with the term, supply chain refers to the entire process by which inputs are converted into outputs and supplied to the final customer. It also includes auxiliary input flows into the system and auxiliary output flows out of the system. The following issues are important to note:

- Firstly, the supply chain consists not only of plant operations but encompasses suppliers of input on one end and the customer to whom cement is sold at the other.
- Secondly, the supply chain consists not only of the physical process through which transformation of inputs into outputs is done, but also includes the bundles of practices that go with such a transformation, such as procurement policies, inventory policies, etc.

Supply Chain Management (SCM) refers to the efficient management and operation of the above processes through well-formulated strategies for sourcing, inventorying, distribution, customer service and finally, integration. Normally, the focus of most cost management programs is on manufacturing activities that form the core of the operations. The SCM route, not only widens coverage to peripheral areas but also additionally addresses the issue of inter-linkages between areas, so as to optimize the entire effort.

Apart from the SCM route, improvement initiatives also need to be holistically integrated in terms of the different functional skills that are required to effect optimal improvement. For example, an intervention in the raw mix influences:

- The cost of raw materials
- The cost of fuel (on account of the differential heat(s) of clinker formation for different mixes)
- The cost of raw grinding and finish grinding power (due to the differential raw material grindabilities and harder/ softer clinker characteristics)
- The cost of consumables such as refractories, grinding media/ lining plates
- Equipment output rates
- Ease of operations, and
- The respective lives of the relevant raw material deposits.

Some of these would have a positive effect on cost reduction, and some, negative. The choice would therefore be to select the most optimal from a host of distinct options.

Focus on the Bottom-line

As has been mentioned earlier, not only is it important to improve physical parameters of performance, it is equally important to seek a reduction in input cost tariffs as well as an increase in output revenue tariffs. Examples of how effective vendor strategies can help influence input tariffs are shown in the table that follows:

Strategy	Benefits
Fewer suppliers	Easier to manage, each supplier gets more business, hence better terms can be negotiated
Long-term contract	Supplier is assured of sustained business, hence more willing to offer good terms
Supplier evaluation	Objective criteria for decision-making; perceived as fair, results in better performance
Freight consolidation	Inbound transporter is also used for outbound movement; gets two-way load and thus offers better terms
Emphasizing performance not specifications	Results in desired performance of supplies, helps sustainability, improves tariffs
Centralized procurement	Useful especially for multi-plant companies. Enables higher buy volumes, hence better prices.
Investment	Investment in vendors either in terms of capital and/ or in terms of facilitating input production often results in tariff reduction and an overall positive benefit/ cost performance.

Other than vendor based strategies, methods such as use of cheaper substitutes (e.g. pozzolana, slag, waste derived fuels, etc.), technology interventions (e.g. power factor reduction, material handling modes, etc.) can also be appropriately investigated to influence cost performance.

In the case of revenue, the use of an optimal market access strategy as well as a well-formulated product/ customer mix strategy, can be extremely effective in order to realize a higher return for every unit shipped. Even in the case of the Indian Cement Industry, several firms have significantly gained from an optimized re-distribution/ product mix strategy.

Non-conventional Areas

As has been mentioned in the section on Status, the improvement initiatives in the Indian Cement Industry have largely been restricted to conventional areas for cost reduction. Areas that have, till now, not been given the importance they deserve, include:

- **Outsourcing**
  Outsourcing of non-core activities, apart from permitting management to concentrate its efforts in more important areas, can have significant cost reduction implications. While some traditionally outsourced areas include security, canteen, packing, transportation, etc., there are further areas where outsourcing is possible. These include maintenance, quarry (other than blasting), workshop, etc. Influencers of make or buy decisions have been factors such as cost of in-house manufacturing, cost of outsourced supplies, labour cost changes, recovery of overheads, under-utilized capacity, etc. In recent times considerations of faster deliveries, reliability, easy access for service, etc., have increasingly become relevant and must be closely investigated for their cost impact.
- **Overheads**
  As mentioned earlier, with overheads, on an average, contributing to over 6.5% of the total costs, enough attention has not been paid towards arresting costs in this area. Data shows that roughly 55% of these are Administrative Overheads whereas 45% are

Factory Overheads. Even a 5% reduction could yield an annualized value of over US $ 0.2 mio of saving for a 1.0 mio mT plant. Rental values, insurance rates, working capital interest, waste elimination, streamlining of administrative processes, etc. are areas that all need to be closely studied for unleashing cost reduction potential.

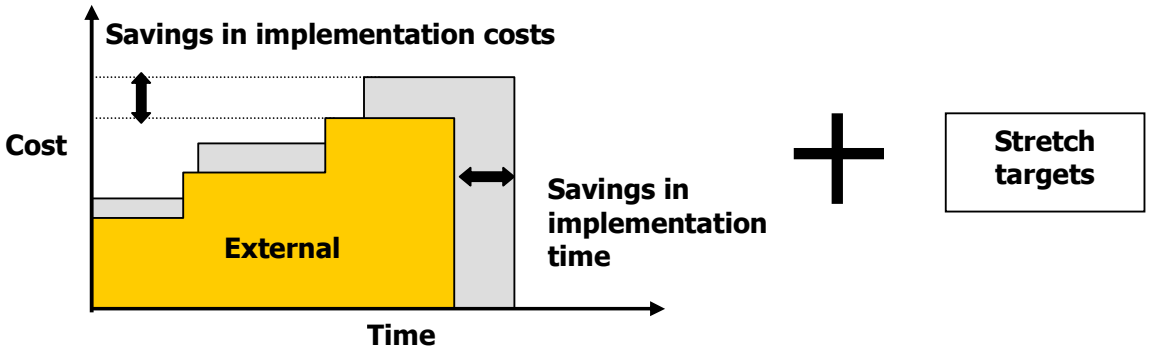
Other than these, operational de-bottlenecking, enhancement of people productivity, realisation of latent equipment capacity, etc. are examples of areas that have enjoyed innovative intervention in the case of a discerning few.

Value additions in On-Going Initiatives

Experience has clearly revealed that to preclude in-box thinking, external assistance in even on-going bottom-line improvement schemes has a tremendous potential for value-addition. In-company personnel often get acclimatized to a constraint-based approach, rather than an opportunity-based one. Value additions can be effected in any or more of the following three areas:

- **Costs of implementation**
  Given external experience in diverse environments, savings can be effected in both capital as well as revenue costs associated with improvement projects. Numerous examples are available on how fine-tuning of existing equipment eliminated the need for capital intensive capacity augmentation.
- **Time for implementation**
  Implementation times for improvement projects have also been dramatically cut down through external intervention. This has helped, not only in realizing benefits faster but also in crashing extremely expensive downtime.
- **Stretch targets**
  Indicators set for improvement targets have also been seen to suffer on account of both in-box thinking as also the normal tendency to be conservative in commitment. External intervention often helps in establishing and achieving stretch targets.

The diagram below depicts the three types of value additions.



Usage of Optimization Tools

The usage of optimization tools in the Indian Cement Industry has been far less than what could be deemed to be adequate. Experience has shown that the usage of the following types of optimization tools for decision making, have significantly facilitated initiatives such as are being discussed in the paper:

- Allocation Models
- Replacement and Maintenance Models

- Inventory Models
- Queuing Models
- Sequencing and Co-ordination Models
- Network Models
- Linear/ Non-Linear Programming Models
- Search Models, etc.

The usage of these models in various application areas generally consist of six inter-dependent steps, namely Problem Formulation, Model Construction, Data Assimilation, Solution Derivation, Model Testing and Solution Implementation. Several companies, especially in the west, have co-opted Operations Research practitioners in their continuous improvement project teams.

Structuring the System for Improvement Initiatives

In terms of setting up a system to make improvement initiatives a perpetual way of life, two issues need to be parallely addressed:

- **Organization Structure**

  Persons in the organization with a flair for analytical and knowledge-related work would constitute the **core organization structure** for effecting continuous improvement. This team would itself be segregated according to an Ishikawa like fish bone structure viz., **M**en, **M**achines, **M**ethods, **M**aterials, **M**oney and **M**ilieu. It has been seen that such a structure is most amenable for problem analysis as well as knowledge management.

  The full-time responsibility of the core team would be to shortlist improvement projects in consultation with senior management, harness external expertise where required, subject each identified improvement project to rigorous analysis and finally postulate problem-solving recommendations. It would also be responsible for managing knowledge by storing information and making this available to the rest of the company on request. Members from the operations framework of the company would jointly participate with select members of the core team in the Action Phase in which improvement projects are actually taken up for implementation.

- **Initiative Planning**

  Structured planning is vital to preclude the possibility of errors in area choice as also in effort repetition. Experience shows that the initiatives most likely to produce expected results are those that have been meticulously and holistically planned. Companies that have a good track record of implementing improvement initiatives have been seen to follow three distinct phases:

  ⇒ **Assessment Phase**

  This is the starting phase in which shortlisting of initiatives is first done using pre-set criteria, relevant data collected, analyses completed, improvement potential identified both in terms of physical parameters/ dollar values, implementation plan constructed and resource requirements specified. It has been seen that, depending on the size of the company/ plant as well as its current status in terms of implementing improvement initiatives, the Assessment Phase extends over a period of 2-4 months.

  ⇒ **Action Phase**

  This is the phase in which, as the name itself signifies, implementation is actually done. As has been already mentioned in the previous sub-section on Organization Structure, personnel from plant operations as well as external experts assist the core team for improvement projects in executing the implementation phase. Since the

realization of benefits may require a change in operating practices, the implementation phase also includes people training, wherever required. The output of this phase is the actual improvement effected along with the management system to measure and ensure sustenance of the improved performance. It has been seen that depending on the number of sub-projects taken up in the first portfolio, the Action Phase could extend over a period of 9-24 months.

⇒ **Monitoring Phase**

This phase refers to the tracking of the actual improvement effected during the Action Phase through the management system mentioned. Statistical analysis as an interpretative tool is rigorously employed to preclude the possibility that the improvement occurred due to 'chance'. Modification and mid-course corrections are also effected during this phase to ensure that the improved performance stays on track. It has been observed that this phase normally runs over a period of 3-6 months for each sub-project group.

Case Study

The structured approach, proposed in this paper has been applied in various cement plants in India as well as in the international environment. One of the more comprehensive applications, in which Holtec was involved as a consultant, was in the case of a 3-line, 2.6 mio mT cement plant in India. The details are presented as **Annexure 2**.

The annexure lists, on one axis, each item of the waterfall. It also details the measures employed for effecting improvements, the capex expended, where relevant, and the usage of the respective elements of the structured approach propounded in this paper. Finally, apart from the average figures in the Indian context, it also includes the before/ after values for each item of the waterfall and thus, the improvements achieved for the specific plant.

It may be seen that not all the elements are positively influenced. The attempt, in such interventions, is to achieve global optimization without getting unduly influenced by the respective impacts on local sub-components.

Conclusion

All forecasts seem to definitely point to the fact that the Indian Cement Industry will become increasingly competitive; not so much in terms of the number of players but in terms of the performance levels expected of it. Consequently, to be able to sustain bottom-line performance in such an environment, producers would need to re-examine the effectiveness and efficacy of the improvement initiatives launched by them till now.

Astute management of the system for effecting improvement initiatives can significantly help in reducing costs, improving asset utilization and indeed enhancing revenues and, thus, the bottom-line. It can benefit enormously through the use of a structured approach and through utilizing a plethora of easily available Operations Research and Information Technology tools. The most important change that would be required concerns mindsets – to throw away the currently prevalent proclivity for in-box thinking and develop the width of vision required to challenge the best in the world! With some international majors already here, and more arriving, there can be no other option.

Annexure 1

CEMENT INDUSTRY SCENARIO – INDIA

INTRODUCTION:

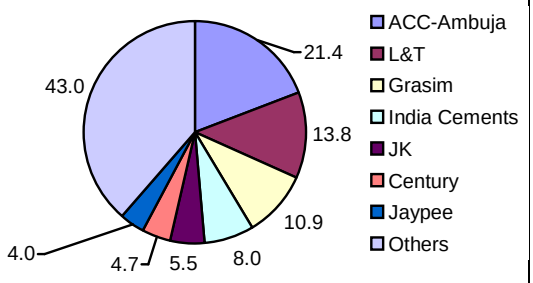
Commencing operations in 1904, the Indian Cement Industry has witnessed a total transformation since its decontrol in 1989. On view is a buyers market with a demanding consumer holding centre stage.

INTERNATIONAL POSITION :

- With an installed capacity exceeding 123 mio MT, India is currently the second largest producer in the world.
- India's exports of cement and clinker however constitute less than 3% of the international trade in these commodities.
- However, with its enormous population of one billion, India's per capita consumption of cement at around 94 kilograms, lags way behind the world average of 250 kilograms, a fact promissory of significant future growth.

INDUSTRY STRUCTURE:

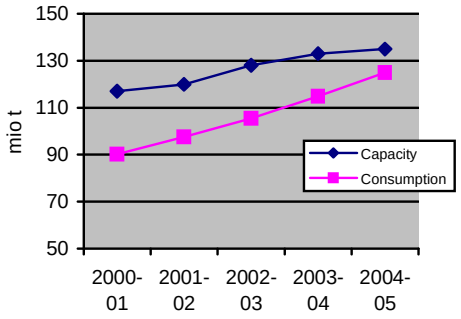
- Cement plants in India are principally located in 8 major limestone-bearing clusters. The number of split-located units is few.
- 72% of cement production is concentrated in 6 states, namely Rajasthan, Madhya Pradesh, Andhra Pradesh, Gujarat, Tamil Nadu and Chattisgarh.
- 113 large size plants, owned by 53 companies, account for a capacity of about 117 mio mT. Over 90% of these utilize the dry process technology.
- An additional 9 mio mT capacity comes from about 300 mini plants, mostly employing the VSK technology.
- 92% of the large plant capacity is privately owned, with 60% of the total capacity being accounted for by 7 major players.
- While global players, till a year or two ago, were virtually non-existent, ownership patterns are witnessing a change with a recent spurt of M&A activity.



Capacity of Major Players in 2000-2001 (mio t)

DEMAND SCENARIO :

- Domestic consumption was about 96 mio mT in the year ending 31st March 2001. This is expected to grow to about 140 mio MT by 31st March 2006. The growth rate has historically been strongly correlated to the growth rate in GDP.
- Demand drivers in the coming years would be tax related sops and capital formation in the infrastructure and housing sectors, lower interest rates/ easier availability of housing finance and increase in per capita disposable income.
- Consumption in the northern and western parts of India is expected to grow faster than that in the southern, eastern and central regions.



MARKETS :

- Most Indian markets are highly fragmented and thus fiercely competitive.
- The northern, eastern and central regions form one entity with the supply and demand being primarily met from within the entity. Likewise, the southern and western regions normally form one entity. However, during periods of surplus, cross-flows between these two entities are significant. The regions with low supply intensity and high consumption density make attractive markets.
- 50% of India's total consumption is concentrated in 50 centres (metros and mini-metros).
- On an overall basis, government consumption works out to less than 15%, private institutional consumption about 30% with the balance being consumed by house-building individuals. While government consumption

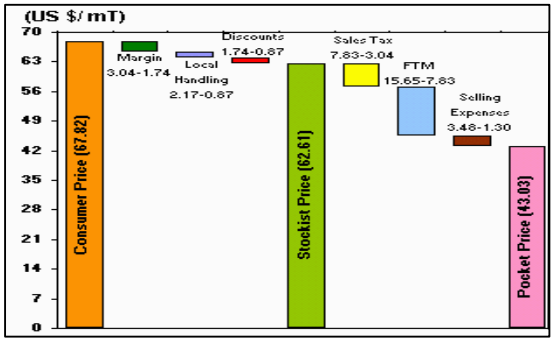
CEMENT INDUSTRY SCENARIO – INDIA

is virtually uniform, wide differences are noticed in the consumption patterns of the other two segments in the different regions.

- 62% of the total cement production is Ordinary Portland. Pozzolanic cement accounts for 26%, slag cement 11% with special cements constituting the balance 1%. With bulk supply being minimal on account of a lack of facilitating infrastructure, nearly the entire production is sold in 50 kilogram bags.

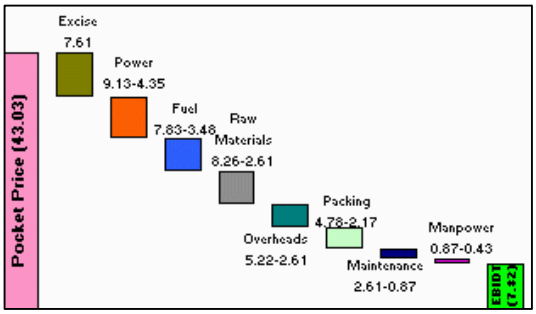
PRICES :

- Cement prices move in cycles primarily influenced by capacity additions.
- Prices vary markedly from region to region and show seasonal trends.
- Oversupply conditions are expected to continue pressurizing the price front in the short term.
- Kerala and Tamil Nadu command relatively high prices, followed by Punjab, Haryana and Maharashtra
- Outbound Freight constitutes 8-16% of the cement price.



INVESTMENT AND OPERATING COSTS :

- It costs around US $ 80 mio to set up a 1.2 mio mT integrated cement plant
- Plant and Machinery constitutes about 50-55% of the total investment outlay
- The major operating cost heads, power and fuel, constitute upto 50% of the total cost of production, excluding interest, depreciation and tax.



TRENDS (Structure of Indian Cement Industry) :

The Indian Cement Industry is expected to remain as the second largest in the world with an estimated capacity of 135 mio mT by the year 2003-04.

The government, through fiscal incentives, provided a discernible thrust to the housing and infrastructural sectors in recent times. This resulted in a high growth of 15% in the year ending 31st March 2000. Consumption, however, fell by -0.3% in the following year. Apart from being a correction, arising out of high growth in the previous year, factors like sluggish industrial and infrastructural growth and poor agricultural output were the primary influencers of this negative growth.

The growth rate in consumption, over the next three years, is likely to be of the order of 6-8% per annum depending on how well the economy functions. This means an increase in demand by approximately 40 mio mT. It is expected that the demand would overtake the supply by end March 2006. This would make the entry into cement industry lucrative. Lower valuations of cement companies, during the last few years, have made them attractive targets for takeovers. This has led to a spate of M&A activity by financially strong groups. The details of these are shown in Box 1. The other M&A targets, currently being negotiated, are listed in Box 2. It is understood that approximately 40 mio mT of capacity could exchange hands before M&A activities subside.

Consolidation within the industry is well underway with the share of the top seven groups in overall national capacity having increased from 62% to 72% over the period 1995-96 to 2000-01.

Another factor that is changing the structure of Indian cement industry is the entry of international cement players. Saturation in the developed markets of Europe has led the international cement companies to venture into the developing markets of Asia (India, China, South-East Asian countries). Lafarge, Italcementi, Holcim, Cemex, etc. are actively hunting for cement units in the potentially lucrative Indian market.

These players have elsewhere been operating in a 'cartelised' market and therefore likely to create a similar market environment in India. This would be additionally enabled by consolidation of Indian players, which is currently happening.

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Another factor that is likely to impact the creation of new capacities is the withdrawal of incentives by the state governments. The earlier incentive regime had led to skewed capacity addition even in a case of oversupply, leading to continuous period of suppressed prices. The withdrawal is likely to lead to more evenly balanced capacity addition by the cement manufacturers. Players, financially strong enough to absorb possible losses in the initial years of its operation, will lead this capacity addition.

The process of consolidation will take place first at a regional level, where the possibility of exploiting synergies and a higher bargaining power is the highest.

The above scenario suggests that Ambuja-ACC combine, L&T (with a possible overseas partner), India Cements, the Aditya Birla Group and 4-5 international cement majors are likely to dominate the Indian cement industry in the coming years.

BOX 1

- Gujarat Ambuja Cements has taken a predominant 11.2% stake in the 11.5 mio mT major, ACC. It has taken over the 1.3 mio mT DLF Cements and the 1.0 mio mT Modi Cements and renamed these as Ambuja Cement Rajasthan Limited and Ambuja Cement Eastern Limited, respectively. GACL has also taken a 5% stake in the 0.6 mio mT Priyadarshini Cements.
- Grasim Industries has acquired the 0.9 mio mT Dharani Cement, one of the first significant acquisitions in the project phase. It has also taken control of the 1.03 mio mT Shree Digvijay Cement. In a major restructuring exercise, Grasim has also acquired the entire cement capacity of Indian Rayon.
- India Cements has acquired Raasi Cements, which has a capacity of 1.8 mio mT. It also acquired Sri Vishnu Cement, a 1 mio mT subsidiary of Raasi Cements. India Cements has also acquired Cement Corporation of India's 0.4 mio mT Yerranguntla pant and the 0.9 mio mT Visaka Cements.
- L&T has acquired the 1.4 mio mT Narmada Cements.
- The first international major to enter India, albeit in a muted way, was Holcim with its holding in the 0.9 mio mT Kalyanpur Cement. It is however understood that sometime back, Holcim has de-consolidated this ownership.
- Lafarge, the international major, made its entry into India by acquiring the 1.73 mio mT, split-located cement capacity of TISCO. Participating in nearly all acquisition deals, Lafarge very recently also acquired the 2.4 mio mT Raymond Cement.
- Italcementi has entered into a joint venture with Zuari Agro with a 50% stake, for its 1.7 mio mT cement unit.

BOX 2

- Grasim Industries is currently negotiating the takeover of the 2.08 mT UPSCC units at Dalla and Chunar in Uttar Pradesh.
- L&T is at an advanced stage of negotiation with Lafarge and Holcim for acquisition of upto 50% stake in its cement business which is being hired off as a separate entity.

Annexure 2

CASE STUDY

Item	Measures Employed for Enhancing the "Bottom-line"	Capex (US $/ mT)	Features Addressed						Country Average (US $/ mT)	Existing Value (US $/ mT)	Changed Value (US $/ mT)	Impact (US $/ mT)
			Integrated Coverage	Intervention in Rates	Non-Conventional Areas	Enriching On-going Initiatives	Use of Optimization Tools	Three Phased Approach				
Consumer Price	• Sales Redistribution. • Product Mix Change. • Brand Building & Customer Promotion.	0.35	✔				✔	✔	67.82	66.52	68.26	1.74
Channel Margin	• Channel Rationalisation • Graded Incentive Scheme.				✔	✔		✔	2.39	1.96	2.01	(0.05)
Local Handling	• Consequent to Sales Redistribution.				✔				1.52	1.09	1.07	0.02
Channel Discount	• Graded Discount Structure.				✔			✔	1.30	1.20	1.23	(0.03)
Stockist Price	• Consequent to changes in the items above.								62.61	62.27	63.95	1.68
Sales Tax	• Consequent to Sales Redistribution. • Relocation of Supply Dumps.		✔		✔				5.43	7.56	7.83	(0.27)
Freight to Markets	• Consequent to Sales Redistribution & Dump Relocation. • Lower Transport rate consequent to reducing truck queue length. • Modification in transport mode-mix.	0.04	✔	✔	✔	✔	✔	✔	11.75	12.98	11.96	1.02
Selling Expenses	• Increased Travel cost for Sales Staff. • Discretionary Expenses on Promotion. • Improved MIS.				✔			✔	2.40	2.10	2.15	(0.05)
Pocket Price	• Consequent to changes in the items above								43.03	39.63	42.00	2.37
Excise	• No change, since this is fixed by the Government of India at a uniform rate.								7.61	7.61	7.61	-

Annexure 2

CASE STUDY

Item	Measures Employed for Enhancing the "Bottom-line"	Capex (US $/ mT)	Features Addressed						Country Average (US $/ mT)	Existing Value (US $/ mT)	Changed Value (US $/ mT)	Impact (US $/ mT)
			Comprehensivity	Intervention in Rates	Non-Conventional Areas	Enriching On-going Initiatives	Use of Optimization Tools	Three Phased Approach				
Power	• Consequent to Product Mix changes. • Consequent to Raw Mix Optimisation (increase). • Optimisation measures adopted for Stacker-Reclaimer, Raw Mill, Preheater Fans, Coal Handling, Clinker Cooler, Cement Mills, Air Compressors, Cooling Towers of DG Sets, Plant Lighting, Air Conditioning and Water Supply. • Optimisation in the utilisation of Power Source (Utility, DG Sets).	0.05	✔	✔	✔	✔	✔	✔	6.74	5.96	5.69	0.27
Fuel	• Consequent to Raw Mix Optimisation. • Use of Alternate Fuels (initial trials only).		✔			✔	✔	✔	5.65	6.29	6.27	0.02
Raw Materials	• Consequent to Raw Mix Optimisation. • Consequent to Product Mix changes.		✔			✔	✔	✔	5.43	2.94	2.80	0.14
Overheads	• Reduction in Inventory Carrying costs for Fast Moving Items through modification of Re-order Cycle and Order Size.			✔	✔			✔	3.91	2.40	2.18	0.22
Packing	• Reduction in Bag Rates by reducing material consumption for principal suppliers.			✔	✔				3.48	2.44	2.25	0.19
Maintenance	• Arresting burning of LT Motors • Increase in Refractory Life consequent to Raw Mix Optimisation.				✔				1.74	1.45	1.42	0.03
Manpower	• Staff Rationalization (Phase I only).							✔	0.65	1.32	1.20	0.12
EBIDT	• Consequent to changes in the items above.								7.83	9.22	12.58	3.36