Consultancy sector gains credit in the Indian Cement Industry

Umesh Shrivastava, Executive Chairman, Holtec Consulting

Over the next five years, Umesh Shrivastava, Executive Chairman of Holtec Consulting Private Limited, expects the total market size to be around Rs 1,200 crore. While yearly variations would prevail, he tells ICR, annual values would be in the range of Rs 180 – Rs 250 crore.

The cement sector is coming of age in India with newer technologies, machinery and processes. How important is the role of consultants in this changing environment?

Given the enhanced availability of both types as well as sources for technologies, processes and machinery, the need for analyzing combinations multiply. Add to this, variables such as input materials and utilities, products, project execution modes, site conditions, and the analytical requirements exponentially escalate.

Consulting firms, such as Holtec, which have had diverse exposure, and which employ experts from all functional disciplines relevant to the cement industry, are distinctly better qualified to perform this analysis and consequently deliver better integrated and more cost-effective systems. Since the number of variables (and the available choices in each) can only increase, the role of consultants in delivering expert value can only enhance. As operating companies enhance their technical capabilities and engineering skills, the value-adding expertise that consultants would need to deliver could however witness significant changes.

How big is the consultancy sector?

No formal estimate of the sector size is available. However, in arriving at our internal estimates, we have split the pure consultancy sector into four distinct sources from which consulting fees evolve.

Over the next five years we expect the total market size to be of the order of Rs.1,200crores. While yearly variations would prevail, annual values would be in the range of Rs.180 – Rs.250crores.

As consultants you must be biased to certain technologies. Either way, which countries and organisations offer the best technologies?

Jay pee Baga 10000 TPD Cement Plant

In our view, technology by itself is meaningless in the context of adding value. It is the customized application in a specific environment that actually determines its success. Thus, while a particular technology can add immense value in a specific situation, a competing alternative may be more suitable in another. Other than the physical benefits derived through the use of a particular technology, its cost-effectiveness, the intrinsic capability of the client to harness/ use it effectively and a host of other criteria determine its actual appropriateness.

The benefits of a specific technology are largely advocated by the technology provider. Consultants, such as Holtec, who have had extensive experience in assessing actual performance in diverse scenarios, are best equipped to recommend the most effective choice in each specific situation. We diligently practise a principle of 'zero bias'.

Having partnered nearly all international technology providers, in the course of our consulting assignments spanning four decades, selected on the basis of the value they brought to the context of their selection, the concept of 'best technologies', we feel, is largely irrelevant.

What is the difference between international markets and India?

Primary differences between international and domestic projects include:

- Most international projects employ the turnkey mode for project execution. In some, a split is made between one on shore and one off shore contractors. In India, while some companies are shifting to the semi-turnkey mode employing five to seven packages, most projects are executed in the shopping mode with the project being executed by as many as 30-35 packages. Our role, in these respective environments, consequently shifts from review engineering (being employed as the owner's engineer) in the turnkey mode to detailed engineering, in the shopping mode, where the need for integration is much higher.
- At the time of project commissioning, the degree of completion in an international project is generally much higher. In India, loose ends continue to get tied up well into the operations phase of a project.
- Performance guarantee tests, in the international environment, are generally carried out with a

far higher degree of diligence as compared to that in India. The role of consultants, in ensuring that these are satisfactorily carried out, is consequently, more demanding.

- Given the role played by international funding agencies in projects outside India, contract management (clause formulation, monitoring and dispensation) is much more advanced.
- Insurance costs in international projects are generally significantly higher than those in India. This is primarily driven by the need for international lenders to adequately safeguard themselves from as many risks as possible.
- Normally, the ratio of structural steel to RCC in civil engineering structures is far higher in international projects as compared to those in India. The availability of appropriate construction equipment as well as the adoption of contemporary construction practices (including those involving safety) is also much higher. While this influences execution time positively, execution costs, generally, become higher.
- Civil engineering design codes are often different between countries. For example, projects in Central Asia generally conform to the Russian design code. Consulting firms, such as Holtec, which have had adequate experience in working with different codes, naturally enjoy a distinct advantage.

What are the new developments in unit operations?

Innovative developments in Unit Operations are quite varied:

- **Mining:** Increasing use of surface miners; utilisation of marginal grade limestone by employing flotation processes as well as multi-screening to reduce silica and adding calcareous industrial waste for enriching lime; improved drilling and blasting operations through better drilling geometry and explosive technology; choice of larger and more fuel-efficient mining and transport equipment.
- **Crushing:** Utilization of larger crushers capable of handling 1.5 m x 1.5 m boulder sizes; throughputs exceeding 1,800 tph for a product size of 75 mm which is acceptable to technologically advanced, raw grinding systems downstream.
- **Raw Grinding:** Adoption of larger (motor sizes – 6,300KW) and more energy efficient VRMs, with capacities up to 550tph, with longer roller/ table lives and improved material bed development; throughput augmentation through higher residues acceptable by technologically advanced, pyroprocessing equipment. In recent times, projects have been offered individually powered, 6-roller (motor sizes, 6x2,000KW), VRMs which could achieve grinding capacities up to 1,000tph.

Pyroprocessing:

- **Preheaters:** Six-stage, twin string preheaters with clinkering capacities upto 10,000tpd; increased cyclone efficiency from 92 - 94 per cent; reduction in l/d ratio in cyclones resulting in a pressure drop reduction from 700 to 400 mm WG and a tower height reduction of 10-15 m; reduction in the total air requirement from 1.6 to 1.45 Nm3/ kg clinker; improvement in fan efficiencies from 72 - 76 per cent.
- **Precalciners:** Degree of calcination pegged at 94 per cent to prevent the onset of liquid phase; calciner to kiln fuel ratio of 70:30; increased residence time from two to five seconds to improve combustion efficiency of fuel mix would result in more acceptable NOx values.
- **Kilns:** Redefinition of operating parameters - volumetric loadings up to 7.5 tpd/ m3, thermal loadings up to 5.5 Gcal/ m2/ kg clinker, filling per cent of 14-16 and kiln speeds up to 5.5 rpm; 2 pier installations with a drop in l/d ratios to 10-11; residence time reduction from 30 to 20 minutes.
- **Coolers:** Increased adoption of new generation (e.g. 'walking-floor') coolers resulting in

increased cooler efficiency from 68-76 per cent, a drop in air requirement from 2.2 to 1.6 Nm3/ kg clinker, a temperature increase of secondary/ tertiary air to 1,000 °C, increase in cooler loading to 55 t/ m2 and significantly reduced installation time by about 20 per cent.

- **Finish Grinding:** In view of their overall cost (capital and operating) effectiveness, large VRMs, with grinding capacities upto 325-350 tph for Pozzalanic Cements ground at 3,500 Blaine, seem to be the flavour of the new decade. The use of Roll Presses has also received a fillip, particularly after the improvements effected in the material quality of liners giving a life of 30,000 hrs.
- **Packing & Dispatch:** To meet increased demands, increased adoption of 240 tph, twin discharge, 16 spout packers; to address variable market demands and dispatch modes, flexibility in the dispatch section are being significantly enhanced through appropriate automation.

Any new innovation in technologies specifically in the Plant Technology & Operation that you would like to advocate?

Developments in other areas of Plant Technology & Operation are:

- **Automation, Instrumentation & Plant Control Systems** aimed at reducing human intervention, automated maintenance (e.g. lubrication) and better process measurement and control. This includes new technologies such as intelligent MCCs, serial bus architecture, and satellite communications.
- **Integrated Quality Assurance Systems** to ensure alignment to International Standards such as EN-197; market demands for higher one-day strengths (by interventions in C3S and product fineness), quicker initial setting (through C3A and gypsum interventions), darker product colour (intervention in C4AF and minor constituents are assuming increased importance.
- **With environmental norms getting more stringent** technology development and acquisition are being harnessed to keep pace; e.g. possible lowering of dust emission norms, from 50 mg/ Nm3 to 10 mg/ Nm3 are resulting in the increased adoption of hybrid filters; the pressure to reduce CO2 emission are unleashing a variety of clean technologies and practices such as cogeneration of power using waste heat, incineration in cement kilns of waste materials to meet the dual objectives of waste disposal and cost reduction, separation of CO2 from kiln exhaust gas and its utilisation in value products.
- **Energy efficiency initiatives:** As against current "best" values of 680 kcal/kg clinker and 65-70 kwh/t of blended cement, these initiatives are expected to result in thermal energy consumption dropping to 665 kcal/kg clinker and electric energy consumption to about 60 kwh/t of blended cement.
- **Alternate fuels/ energy sources:** While lignite, petcoke, tyres, bagasse, and rice husk have been around for some time now, several plants are already using/ or currently investigating hospital refuse and municipal waste as workable alternatives. **Waste Heat Recovery** (WHR) systems appear to be gaining increasing favour not only in the Indian Cement Industry but also in the MENA countries. By providing an avenue for recuperating heat (which would otherwise have been lost) and converting it to electrical energy, it reduces the requirement of power from a state-owned utility/ Captive Power Plant being conceived/ installed at the unit. With consultants offering integrating services including process knowhow, and several suppliers offering cost-effective and reliable equipment, the number of WHRS installations are expected to grow exponentially in the coming few years.

Pricing between Indian and international products and prices may vary a lot. How great is the difference? And how receptive are Indian companies to pricing? Do they go for the best or do they settle for the second best?

The delivered price difference between products manufactured internationally (especially in Europe) and those manufactured in India (either in the manufacturing bases of European suppliers/ those with technological tie-ups) is of the order of 20 – 30 per cent. While Chinese equipment is much cheaper at its manufacturing source, its delivered price is still – five per cent more than Indian supply. Quality differences, however, as mentioned earlier, are minimal.

While Indian clients are certainly price sensitive, the competitive environment in the cement market does not generally permit a choice of equipment that may be cheap, but does not have a track record for sustainable reliability and efficiency. Thus, the perception, that Indian companies are willing to sacrifice quality because of price is incorrect.

In this context, I would like it to be put on record, that in terms of physical parameters of performance, the well-performing Indian plants are possibly better than most of their international counterparts.

India is currently going through an upheaval with coal availability being tightened, prices taking a hit and generally seeing a gloomy horizon. What would you suggest to make things efficient for cement companies to enable them to face the situation and come out trumps?

In the wake of emerging threats, opportunities for innovation continue to arise. Notably, significant opportunities remain untapped in the areas of resource conservation, cost reduction, environment management and customer service.

- Dwindling of natural resources is a serious cause for concern. Among these, limestone, fossil fuel and water, if not conserved, could definitely inhibit the long term growth of the industry. The onus of conservation, till now, has generally been technology-based and, therefore, largely driven by equipment suppliers. Wasteful practices need much higher attention and cement producers must pick up the baton on directly arresting these in the course of normal operations.
- Cost reduction imperatives would remain a dominant concern over the next two to three fiscals during which price pressures are expected to prevail. Till now, performance enhancement initiatives have largely been directed towards addressing energy efficiencies, equipment availability and input material costs.

Adequate attention has, only been recently directed at one of the largest components of delivered cost, viz. input & output freight. An analysis of the components of the final delivered cost of cement shows that 40 per cent is constituted by production costs, 25 per cent by the transport costs of inputs & outputs and 35 per cent by direct & indirect taxes. Optimization of transportation logistics, spanning modes, nodes and routes, is thus an area deserving a higher degree of focused attention.

The potential for reducing costs in non-equipment related domains, e.g. material inventories, consumable consumption rates & tariffs, financial expenses, etc. has still not been adequately harnessed.

Upgraded facilities do not automatically translate into lower costs unless these are accompanied with better work practices and higher operator skills. In countries, which are technologically not advanced, significant efforts are required to harness untapped potential on this dimension.

Going forward, CEO focus would, possibly, shift from addressing "costs" to addressing "realization (revenue less costs)". Additionally, the focus would also need to shift from unit consumption rates (physical metrics such as specific fuel consumption, etc) to total costs which are unit consumption rates multiplied by the unit cost rates; our experience has led us to believe that the potential to reduce unit cost rates generally remains, relatively, unaddressed.

- A primary reason for the gap between demand and consumption is the high market price of cement. **Producing "affordable cement" without compromising the quantum (not per cent) of EBIDTA** is possibly the one major initiative that would possibly dwarf all other initiatives. This would necessitate the harnessing of technology, amending operating practices and modifying customer mindsets. The net effect would be huge increase in customer base and consequentially an explosion in the size of the cement market pie!
- The **range of products available**, progressive volumes and respective quality specifications could be targeted as a focus area of change on account of market forces, cost imperatives and alignment of quality standards to those accepted globally. A large component of this change could be effected through technology intervention but would also need incessant customer education as well as changes in standards and statutes.
- Given the exponential growth in cement capacity, a **shortage of skills** is being incessantly faced. Initiatives that need greater attention include:
  - **Lower human dependency** through increasing automation as well as creating and nurturing outsourcing options
  - **Training** and exposure to operations in more developed economies.
  - **Modifications in operating practices** targeted towards amending headcount.

ICR: As consultants you must be having a finger to the pulse of the sector and be able to predict the direction of the industry. Where do you see the cement sector in India in the coming days?

The threat of looming overcapacity, in our opinion, is possibly overemphasized. Players with an intent of sustained presence in capital-intensive industries are well aware of the significance of industry cycles and have devised suitable buffering mechanisms to counter negative impacts in the short term. A supportive feature has been the comparatively low breakeven points in India, effected principally by the very high percentage of blended cement consumption.

In the Financial Year (FY) 2010 - 11, consumption in India at 222 mtt was 82 per cent of the effective installed capacity, almost 20 - 25 percentage

points above the average breakeven! Thus, industry plight is not as bad as it is made out to be.

Holtec's view of likely trends is shown below:

- Cement consumption likely to grow from 222 mt in FY 2010 - 11 to 326 mt in FY 2015 - 16.
- Bulk cement sales could increase from 10 to 35 mttpa and road despatches from around 140 to 200 mttpa with RMC increasing 7 per cent to 15 per cent of total concrete. This would result in OPC consumption displacing PPC consumption by about 4 per cent
- Over the same period, domestic supply capability is expected to grow from 266 mt to 400 mt, indicating a capacity utilization of 84 per cent in the terminal year.
- Holtec's price forecasting model, employing a total of 28 variables, indicates an average price CAGR of 7 per cent pa; this would indicate a retail price of s 328 per bag in FY 2015-16.
- About 35 - 40 new clinker capacities are expected to be created with effective unit kiln capacities varying between 6,000 - 12,000 tpd. About 20 new split units could be created with capacities between 1 - 5 mtpa. Coastal locations would be increasingly favoured for such split units.
- With pre-project activities, such as land acquisition and statutory clearances, being expected to consume more time, industry players could attempt to bring down actual construction time by employing more steel in civil engineering structures.
- With capacity growth being considerable, the inability of late entrants to attract quality manpower could possibly result in Plant Operations being outsourced to specialized agencies including equipment suppliers.
- With the life of cement grade limestone reserves being limited to the next 40 years or so, initiatives to use poorer grades appear imminent; despite conventional wisdom, high quality limestone imports are, possibly, inevitable.
- Given the acute shortage of domestic coal and the increase in costs in imported coal, alternate fuels would continue to receive enhanced attention and could provide 7-10 per cent of the total thermal fuel requirements by FY 2015 - 16. The usage of gas, especially in plants enjoying logistical proximity to gas resources, could well become a reality.
- Energy consumption to fall to 665 kcal/ kg clinker and 60 kwh/ t of PPC.
- Statutory interventions are expected to get increasingly stricter in the utilisation of diminishing resources, environmental control and customer safeguards.

In light of the above scenario, the next one to two fiscals could see lower capacity utilizations, possibly in the mid-seventies range. This, coupled with the recent interventions by the Competition Commission of India, would perpetuate, if not escalate, the currently existing downward pressure on prices. Valuations of financially weak players, operating in surplus regions could see a decline. This could spur a sequence of M&A activities. This period could also witness several players creating overseas manufacturing presence in limestone-rich, economically-deprived countries. The principal objective would be to offset domestic risks such as those caused by cyclic over-capacity, political disturbance, depleting mineral resources, high borrowing rates, threat of a realty meltdown, difficulties in land acquisition, impediments of acquiring environmental & other clearances, etc.

About Holtec Consulting:

Holtec Consulting's advisory portfolio covers all three phases in the life cycle of the industry.

- Services in the **Project Generation Phase** include Country Studies, Investment Opportunity Studies, Due Diligence Assignments, Databasing Services, Strategic Location Services, Geological/ Geo-Technical/ Hydrological Investigations, Feasibility Studies, Market Studies, Manpower Planning, Environmental Studies, Execution Planning, Finance Facilitation, etc.
- Services in the **Project Implementation Phase** include Computer Aided Deposit Evaluation & Mines Development, Basic Engineering, Equipment & Service Procurement, Detailed Engineering (spanning Civil/ Structural, Mechanical, Process, Electrical, C&I, Captive Power Plant & Waste Heat Recovery Systems, etc), Contract & Project/ Construction Management, Inspection, Commissioning, Market Entry strategies, MIS development, etc.
- Services in the **Operations Phase** including Technical Audits, Benchmarking, Performance Enhancement, Asset & Resource Management, Waste Utilization, Business Consulting (covering Markets, Human Resources, Information, etc), Civil/ Structural Assessment, Plant Operations & Maintenance, etc.

In addition to its advisory portfolio, Holtec additionally operates and manages cement plants globally and also provides overall solutions encompassing the integrated delivery of services & outsourced products. This it delivers through its two wholly owned subsdiaries viz. Holtec Global Solutions FZE operating from Sharjah, U.A.E. and Holtec Global Solutions Private Limited, headquartered in India. ICR