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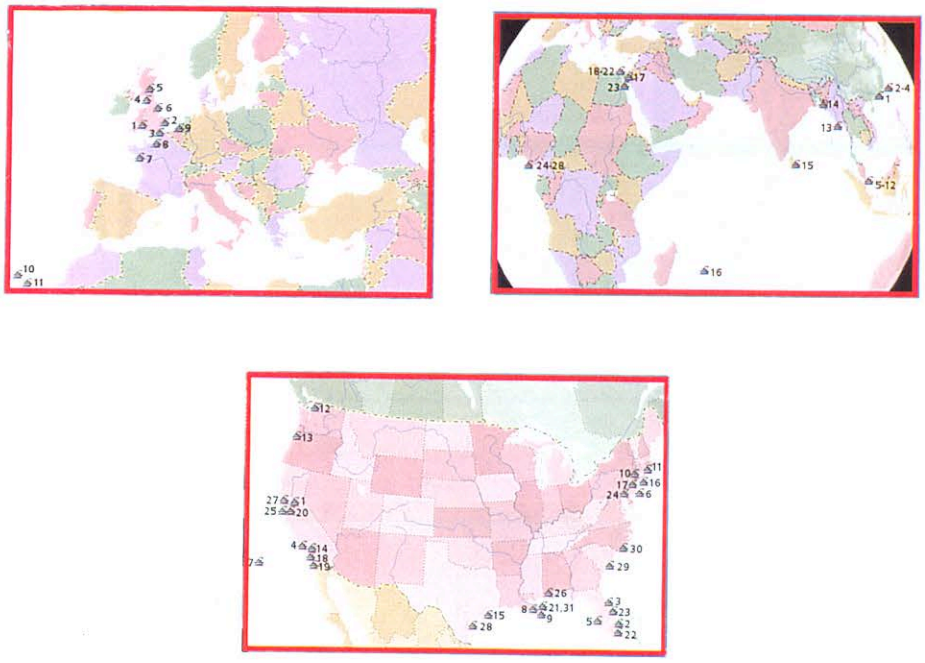
Worldwide Import Terminals for Asian Cement



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WORLDWIDE IMPORT

Ad Ligthart, Cement Distribution Consultants, the Netherlands, discusses the availability of worldwide import terminals for exported cement from Asia.*

Introduction

The impact of the Asian financial crisis has been extremely severe on its cement industry. It left many cement producers not only with a very large oversupply situation, but also with large foreign currency debts on their new cement plants.

Exporting cement is the natural solution for such situations. The reasons are obvious:

- Better utilisation of plant capacity (lower operational cost per ton).
- Every export dollar earned above operational costs ads to the bottom-line.
- Foreign currency income to pay off foreign debts.

What we have seen, however, is not only an increase in exports but also a move in which most of the companies best capable to export are now (partially) owned by the world major cement groups.

This paper will try to give an insight in the Asian export situation, and explain why this was unavoidable. It will do so in two ways. Firstly, by looking into the economical factors of exporting and distributing cement, and secondly by looking at the worldwide import situation.

Letting the world know that good quality cement is available at a low cost is insufficient to sell cement for export. What is needed is the ability to connect both ends of a distribution chain. This includes:

- An export base.
- Suitable shipping.
- An import facility.

Most important however is that, connected to the import facility on the other end of the ocean, there is a market willing to accept the cement.

Economical factors of exporting and distributing cement

To get an insight in exporting cement it is essential to know the economical factors of moving cement from the production plant to the end user on the other side of the ocean. These factors can be subdivided into four main groups:

- Cement delivery F.O.B.
- Shipping.
- Shipunloading.
- Terminal operations.

These groups have been chosen because each reflects a key step in the whole distribution operation. A cement price ex-works for example is irrelevant in respect to export. What counts is the price of delivery FOB. A cement plant on the waterside with a deep-water ship access may have a competitive edge, but if a competitor located inland is prepared to truck the cement all the way to the port and load the cement there for the same price, then from an export view they are considered equal.

Shipping adds another dimension as here the distance to the import terminal plays a large role, and with that the CIF delivered price of the cement.

Shipunloading is considered to be a separate group as this allows a comparison between using general cargo vessels in combination with shore-based shipunloaders versus using selfdischarging cement carriers.

Terminal operations are the final link. The cement price ex-terminal provides the basis for competitiveness compared to local cement plants and other terminals.

Economics of cement delivery FOB

The most important economical factors of cement delivery FOB are as follows:

- Quality/certification.
- Relationship between supplier and buyer.
- Annual requirement.
- General economical situation/ supply-demand situation.
- Shiploading capabilities:
  - Shipsize.
  - Shiploading capacity.

Quality is no longer just a requirement to meet a certain standard. More and more it is a factor that influences the price. This is because of the increased use of fly-ash and slag in cement worldwide. The better the quality of the cement, the higher the percentage of slag and fly-ash that can be mixed with it to get a certain strength of concrete. Certification can also affect the price. Having a certificate that enables exports to country X whilst competitors do not have this, definitely allows for a price increase. The relationship between supplier and buyer is of large importance: it is all a matter of trust. A supplier that loads ships on time, without trouble, with consistent quality over a long period for a customer should be able to get a better price than exporters that frequently mess up their deliveries.

**Based on a paper presented at the 4th Asia Cement Markets Conference, 4-5 April 2000, Singapore.*

TERMINALS FOR ASIAN CEMENT

Annual requirement also affects pricing. The cement industry is very capital intensive and economy of scale is very important. High annual quantities provide lower costs and an incentive for lower pricing.

It will be clear that the general economic situation and the supply-demand situation are the crucial factors in respect to the general price level of cement.

Shiploading capabilities are also important with respect to cement pricing. Being able to load the optimum shipsize for the transportation is of course a requirement. Being able to load such a ship in two days where the competition needs four, definitely leaves some space for a higher cement price.

These economic factors are all concerned with the price of export cement. For shipping, shipunloading and terminal operations, this paper will look at the economic factors from a cost perspective. This is because the price of cement FOB and the price ex-import terminal are market driven. In between them there are a number of costs. Once these costs are understood, it is also possible to understand where the margins are being made and where it is important to have control.

Economics of shipping

The economic factors of shipping from a cost perspective can be broken down as follows:

- Shipping distance.
- Size and type of ship:
  - General cargo vessel.
  - Selfdischarging ship.
- Type of shipping contract:
  - Time charter.
  - Spot market.
  - Contract of affreightment.
- Annual quantity.
- Loading and unloading days:
  - Shiploading capabilities of cement supplier.
  - Average capacity of shipunloader at terminal.
  - Definition of 'ship empty'.
  - SHINC or SHEX basis.
- Port costs:
  - Dock use.
  - Tie-up - let-go charge.
- Economical factors:
  - Cost of fuel.
  - Trade route.
  - Availability of ships.

Shipping cost is the crucial factor in cement distribution. The shipping cost can sometimes actually be higher than the FOB price of the export cement. The key factor in overall shipping cost is the shipping distance. One effect of this is quite clear: the shorter the distance, the lower the transportation cost. The location of a cement exporter in respect to the import terminal is a large competitive factor. Not only is the shipping distance important, but also the availability of sufficient ships of the right size and the availability of return cargo on that route.

Big ships have a considerably lower daily cost per ton than small ships. However, loading and unloading time for these ships is expensive. The result is that on short distances small ships are more economical and the longer the distance, the larger the most economical ship will be. Some indicative examples of distances with economical shipsizes are:

- Malaysia - Singapore: 5000 dwt.
- Indonesia - Bangladesh: 10 000 dwt.
- China - Singapore: 15 000 - 20 000 dwt.
- Thailand - USA: > 35 000 dwt.

Using larger ships however, also means that larger shipunloaders and terminal facilities have to be used. As will be shown, there is a larger cost associated with this. More important however, is that there are only a limited number of large terminals in existence and building new ones (taking also into account planning and permits) takes at least two years.

Some cost examples of recent (February 2000) long distance shipping with 35 000 dwt ships or larger are:

- Asia - West Coast: US$ 11-14/t..
- Asia - Gulf Coast USA: US$ 18-21/t.
- Asia - West Europe: US$ 12-15/t.

Large terminals have storage volumes of 50 000 to 60 000 t and with that are suitable to handle 40 000 dwt ships. An interesting development can be seen at the Mississippi-delta where cement from Asia is wholly or partially discharged directly in riverbarges, omitting the need for intermediate shore storage. Without this limitation, larger ships can be used. Panamax size ships (up to 65 000 dwt) are now increasingly being used to this destination and even a 100 000 dwt vessel has travelled between Thailand and the Mississippi-delta, all the way around the Cape. The present economy of these large ships has now triggered a new phenomenon: the super termi-

nal with 90 000 t of storage and a 1600 tph shipunloader. The first of these is under construction on the US East Coast.

Economical factors of shipunloading

Investment costs

- Cost of unloading system:
  - Size of ship.
  - Capacity of unloader.
  - Distance dock to storage facility.
  - Special requirements of terminal site.
- Transport costs of equipment to site.
- Installation and erection.
- Cost of power supply.
- Commissioning, start-up and testing.
- Payback period.
- Annual tonnage.
- Interest rate (or required ROI).

Operational costs

- Labour:
  - Operators.
  - Clean-up crew.
  - Union situation.
- Energy costs:
  - Demand charge.
  - Usage charge.
- Hold clean-up cost.
- Maintenance cost.
- Stevedoring charge

The costs per ton of a shipunloading system are mostly dependent on the shipsize, the characteristics of dock and terminal site as well as the annual throughput. The shipsize has a large impact on both the capital cost and operational cost of the unloading system. A shipunloading system designed to unload ships of approximately 5000 dwt and convey the cement to the storage facility will cost approximately US$1-1.2 million. A similar system, for 25 000 dwt ships, will have a cost of US$2.5 - 3 million, and a shipunloading system for 40 000 dwt ships will be about US$4.5-7 million. In addition, operational costs for ship unloaders vary greatly with their size. The larger the unloader and storage facility, the longer the conveying distances, and with that, energy consumption and maintenance. The typical operational cost to unload a 36 000 dwt ship on the West Coast of the USA is more than US$3.00/t. The operational cost to unload a 5000 dwt vessel in a small port along one of Asia's coasts probably would be less than US$1.00/t.

The combination of shipping and shipunloading cost gives a good figure to compare the combination of general cargo vessels and shore based shipunloaders against selfdischarging cement carriers. Self discharging cement carriers usually have substantially lower unloading costs, but they have a higher daily cost than general cargo vessels of the same tonnage

Table 1. Combined cost of shipping, shipunloading and terminal operations for exporting and distributing cement to the US West Coast

Export price FOB Asia	US$20.00/t
Shipping CIF West Coast USA (February 2000)	US$14.00/t
Capital cost unloading system and terminal	US$5.00/t
Operational cost unloading system and terminal	US$7.00/t
Cost ex. import terminal	US$46.00/t
Present approx. sales price level ex USA West Coast import terminal	US$65.00/st =US$72.00/t

Note 1: Assumed is an import terminal with an overall capital cost of 17 million US$ and an annual throughput of 600.000 tpy.

Note 2: Since March shipping costs have gone up and now are in the US$ 17,00 - 18,00/ton range

Table 2. Available import terminals in the USA.

Nr.	Name	Location	Ownership
1	Calaveras Cement	Port of Stockton, CA	CBR Heidelberger
2	Continental Cement	Port Everglades, FL	CBR Heidelberger
3	Continental Cement	Cape Canaveral, FL	CBR Heidelberger
4	CPC terminals	Wilmington, CA	Taiheiyo / CBR -Heidelberger
5	Eastern Cement Co.	Port Manatee, Palmetto, FL	Lafarge
6	Essex Cement Co.	Port Newark, NJ	Titan Cement
7	Hawaiian Cement (under cons.)	Barbers Point, Hawaii	Hawaiian Cement
8	Holnam	Globalplex, Reserve, LA	Holderbank
9	Lafarge (transshipment)	New Orleans, LA	Lafarge
10	Lehigh Portland Cement	Cementon, PA	CBR - Heidelberger
11	Lehigh Portland Cement (under cons.)	Providence, R.I.	CBR - Heidelberger
12	Lone Star North West	Seattle, WA	Taiheiyo
13	Lone Star North West	Portland, OR	Taiheiyo
14	MCC-Lucky Cement	Long Beach, CA	Mitsubishi/Lucky Cement
15	North Texas Cement Co.	Port of Houston	North Texas Cement Co.
16	Norval Inc.	Brooklyn, NY	CBR - Heidelberger/Cemex
17	New York Cement Co.	Brooklyn, NY	Quadrozzi
18	Pacific Coast Cement	Long Beach, CA	Cemex
19	Pacific Coast Cement	San Diego, CA	Cemex
20	Pacific Coast Cement (planning/cons.)	Richmond, CA	Levin Richmond Term./Cemex
21	R.C. Cement Co. (transshipment)	New Orleans, LA	Unicem
22	Rinker Materials	Port Everglades, FL	CSR
23	Rinker Materials	West Palm Beach, FL	CSR
24	Riverside Construction Materials	Bristol, PA	Silvi Group
25	RMC Pacific	Port of Redwood City, CA	RMC
26	Southern Cement LLC	Mobile, AL	Southdown
27	Golden Eagle (floating terminal)	Stockton, CA	Mitsui (used by Taiheiyo & Kaiser)
28	Creda (floating terminal)	Galveston, TX	Holderbank
29	Kinder Morgan (under cons.)	Charleston, SC	Kinder Morgan/ Blue Circle
30	Southdown	Wilmington, NC	Southdown
31	Lone Star	New Orleans	Lone Star

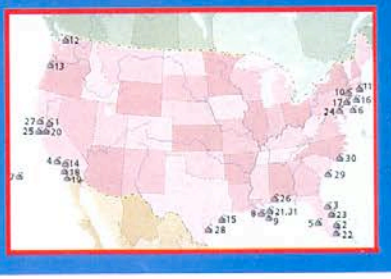

Figure 1. Available import terminals in the USA with shipunloader and storage facility capable to handle ships of 30.000 dwt and larger.

Table 3. Available import terminals in Europe

Nr.	Name	Location	Ownership
1	Castle Cement	Avonmouth, UK	CBR - Heidelberger
2	Castle Cement	London (West Thurrock), UK	CBR - Heidelberger
3	Seabulk	London (Tilbury), UK	Seabulk / RMC
4	Seabulk	Liverpool, UK	Seabulk / RMC
5	Seabulk	Edinburgh (Leith), UK	Seabulk / RMC
6	Titan Cement	Hull, UK	Titan
7	Ciments d'Atlantique	St. Nazaire France	Local
8	RMC (under construction)	Le Havre, France	RMC
9	Unknown	Rotterdam, Netherlands	Local
10	Cementos Archipelago	Tenerife, Spain	Local
11	Cementos Archipelago	Las Palmas, Spain	Local

Figure 2. Import terminals in Europe with shipunloader and storage facility capable to handle ships of 25 000 dwt and larger.

and they can not take return cargo. In general, self-discharging ships are very effective on short and medium distance routes, especially if they can serve several terminals. To use them on long distance routes such as between Asia and the USA however, is very expensive.

Economics of terminal operations

Investment costs

- Cost of storage facility
  - Size (shipsize + required buffer storage)
  - Type
- Cost of terminal equipment
  - Layout
  - Capacities
  - Bulk/bag ratio
- Transportation costs
- Installation and erection
- Commissioning, start-up, testing
- Infrastructural changes
- Payback period
- Annual tonnage
- Interest rate (or required ROI).

Operational costs

- Labour
  - Manager + staff
  - Shift workers (opening hours of terminal)
  - Union situation
- Energy cost
  - Demand charge
  - Consumption charge
- Maintenance
- Overheads (insurance, communications, supplies, etc.)
- Cost of land (lease)
- Wharfage

Similar to the shipunloading system, the capital and operational costs of a terminal are strongly dependent on shipsize, characteristics of the terminal site and annual throughput. Capital costs for small terminals are relatively quite low. A terminal suitable for 5000 dwt ships will have a storage facility of 7000- 10 000 t capacity. Such a terminal can be realised for between US$0.6 - 1.0 million (excluding shipunloader, excluding bagging facility). Terminals suitable to receive 35 000 dwt ships require a storage facility of 50 000-60 000 t and will have a cost ranging between US$7 and 30 million.

The wide difference in capital cost for large terminals is a clear indication that many companies still do not understand cement terminal design. A cement terminal is not an extension of a cement plant but a distribution facility and distribution logistics and cost factors are entirely different to those of a cement plant. The difference between a flat storage warehouse and a 60 000 t dome might be US$2-3 million. The large differences in terminal costs are therefore not caused by the type of storage facility. There might be a difference because of site characteristics. However, the difference in capital costs is mostly caused by inadequate terminal design and equipment selection because distribution logistics and cost factors are not properly understood. Terminals with a high capital cost tend to have a high operational cost as well caused by the substantial higher amount of equipment and buffer storage that they include.

Operational costs for a large terminal facility can vary strongly with the cost of labour, energy, site lease and wharfage cost. In the USA this will range between US$2.50 and US$4.50/t.

A small terminal suitable for 5000 dwt ships in Asia probably would have operational costs in the US$1.00 to 2.50/t range.

Based on above information, it is now possible to make a rough review of the combined cost of shipping, shipunloading and terminal operations. The results of looking at exporting and distributing cement to, for example, the US West Coast, are shown in Table 1.

For small scale terminals the combined shipunloading and terminal operations (capital plus operational cost) will range between approximately US$4.00 and US$8.00/t, even with a much smaller annual throughput.

Worldwide import situation

As can be concluded from the above, the key position in a situation of cement oversupply is to have an import terminal and the market behind it. Building a large scale import facility takes two years, so when the Asian economical crisis happened and the Asian cement companies wanted to export their oversupply as soon as possible, they had to make use of existing facilities. What situation did they face?

The biggest cement import market in the world is the USA, absorbing a massive 24 million tpa. Part of that quantity is supplied from Canada across the Great Lakes, but the low export and shipping prices opened a potential market for Asian export cement on West Coast, Gulf Coast and East Coast totalling over 18 million tpa. Figure 1 shows the locations of US terminals that have a storage facility and shipunloader of sufficient size to receive ships of 30 000 dwt and larger. Table 2 provides the names, locations and ownership of these terminals.

From this information, the following can be concluded:

- Of these thirty-one terminals, twenty-seven already exist and four are under construction or in the planning stages.
- Twenty-four are (partially) owned/operated by multinational cement groups, five by US cement manufacturers and two by ready-mix groups.
- Four terminals are of the floating terminal type. Two of these have been in place for many years, and two arrived after the present growth of imports started.
- Eighteen are (partially) owned/operated by Holderbank, CBR - Heidelberger, Lafarge, Blue Circle, Cemex and Taiheiyo. These terminals probably handle over 70% of the ocean shipped import volume.

The situation in Europe is rather different. As a whole, the continent has an oversupply of cement, but the situation can differ strongly per country. Figure 2 shows those import terminals which have storage facilities and shipunloaders suitable to handle ships of 25 000 dwt and larger. The names, locations and ownership of these terminals are provided in Table 3.

This figure is not representative of the whole import situation in Europe. There are close to 50 small terminals spread out over the Mediterranean, Atlantic coasts, and Baltic. Interestingly enough, most of these are owned by local ready mix/concrete product groups. However, these terminals are too small to economically receive cement from Asia.

From this review of terminals large enough to receive ships from Asia the following can be concluded:

- Of these eleven terminals, one is still under construction, and two are receiving larger shipunloaders in the near future.
- Seven are in the hands of multinational cement groups and four are owned by ready-mix/concrete product groups.
- The total import volume of all these terminals together is probably less than 2 5 million tpa. This is not very much.
- Of interest is the import operation in Rotterdam. This is the only operation where cement from Asia is imported. Here cement is discharged by local stevedoring companies from ship to river barges and these river barges are actually used as a combined means of storage and transportation to the final customers, which are German and Dutch ready-mix/concrete products companies.

Figure 3 shows the import terminals in Asia, Middle East and Africa which have storage facilities and shipunloaders large enough to receive cement from Asian exporters. This picture does not reflect the overall import situation in these areas. Within Asia and the larger Indian Ocean region, large quantities of cement are distributed by selfdischarging ships. Most of these ships are owned or under contract of

Table 4. Available import terminals rest of the world

No.	Name	Location	Ownership
1	Far East Cement	Lamma Island, Hong Kong	Local
2	Asia Cement	Taichung, Taiwan	Asia Cement
3	Universal Cement	Taichung, Taiwan	Universal Cement
4	Tong Yang-Chia Hsin	Taichung, Taiwan	Tong Yang / Chia Hsin
5	Pan Malaysia Cement	Jurong Port, Singapore	Blue Circle
6	Singapore Cement	Jurong Port, Singapore	Taiheiyo/Local
7	Jurong Cement	Jurong Port, Singapore	Local
8	Asia Cement	Jurong Port, Singapore	Asia Cement
9	Ssang Yong Cement	Jurong Port, Singapore	Ssang Yong
10	United Cement	Jurong Port, Singapore	Blue Circle
11	National Cement	Jurong Port, Singapore	Local / Holderbank
12	Sin Heng Chan	Jurong Port, Singapore	Local
13	Unknown (under cons.)	Birma	Unknown
14	Scancem (floating terminal)	Bangladesh	CBR Heidelberger
15	Tokyo Cement (planning/cons.)	Colombo, Sri Lanka	Local/Japanese
16	Ciments de l'Océan Indien Limitée	Port Louis, Mauritius	Local
17	Coregidora (floating terminal)	Suez	Cemex
18	Al Fahd	Damietta	Al Fahd (Bourini)/ Cemex
19	Seament IX (floating terminal)	Alexandria	Seabulk
20	Seabulk Hope (floating terminal)	Damietta	Seabulk
21	Aquaba Falcon (floating terminal)	Damietta	Holderbank
22	4M (floating terminal)	Alexandria	4M Co./ Titan
23	Eastern Falcon (floating terminal)	Safaga	CTI
24	Flour Mills of Nigeria	Lagos	Local
25	Eastern Bulk Cement	Port Harcourt	Holderbank /Local
26	Bonny-Allied	Bonny River	CBR - Heidelberger / Local
27	Dangote	Apapa	Local
28	Blue Circle/Lafarge (under cons.)	Port Harcourt	Blue Circle/Lafarge

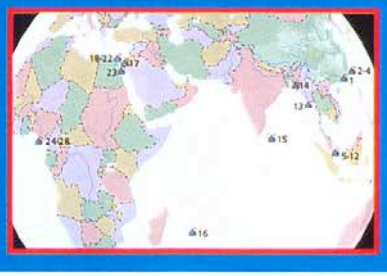

Figure 3. Import terminals with shipunloader and storage facility of suitable size to receive ships with Asian export cement.

cement suppliers and therefore these terminals do not provide an opportunity for new exports. Table 4 provides a list of the remaining terminals. From this list we can draw the following conclusions.

- Of the twenty-eight terminals listed, four are still under construction/planning.
- The terminals in Taiwan, Hong Kong and Singapore are almost all owned by cement producers and even before the economic crisis were importing cement from within the region (or were even only being used as domestic terminals). They did not present new opportunities.
- Of the remaining sixteen terminals, probably ten are owned by the multinational cement groups, of which probably nine by Holderbank, CBR-Heidelberger, Cemex, Lafarge, Blue Circle.
- There are seven floating terminals of which six are in Egypt, as a result of the country's import boom. With the new production capacity in Egypt coming on line, imports are expected to decrease.
- Egypt and Nigeria have provided sizeable import opportunities. The imports in the Indian Ocean region terminals are relatively small.

South America and Australia have not been mentioned in this review. Neither of these continents is receiving significant quantities of Asian cement, nor represents a significant opportunity at present.

Conclusion

When the financial crisis broke, the Asian cement producers faced a huge oversupply situation in combination with large foreign debts. They did not have the time nor the international network to build up overseas markets for their cement and therefore were fully dependent on existing import terminals and markets. As has been shown, these are largely controlled by the multinational cement groups. To be able to export, co-operation with the multinational cement groups was inevitable. The consolidation and change of ownership in the Asian cement industry largely reflects the ownership of the large worldwide cement import terminals.

Fluctuations and general growth of the worldwide economy are constantly changing local cement consumption. Countries that are exporters now can be importers a few years later. The ability to distribute surpluses on one side of the world to shortages on the other side is not only highly profitable but also provides a substantial power base. The multinational cement groups have clearly understood this. Whereas approximately 40-45% of world cement production is controlled by the large multinationals, they control 80-85% of world bulk cement trade and this is key in their expansion worldwide.

What are further opportunities for export for the Asian cement producers? The world-trade volume of bulk cement is still growing. The larger multinationals will take the major share of this and when they offer to buy a large quantity of cement, this will be a strong incentive for Asian cement producers to join them. The remaining 'free' part of world cement trade is still sizeable and does offer opportunities. However, to a large extent this market segment is highly disorganised. On one side there are a number of experienced, reliable, independent cement exporters facing newcomers with little experience but cut throat pricing. On the other side are national cement producers that need imported cement to maintain their market share and independent ready-mix and concrete product groups squeezed by the vertical integration of the industry. Some of these have international experience. Many of them have not. In between there is an army of traders, some with the required strategical knowledge, but many just chasing the next short-term deal.

Asian cement producers that want to become serious and successful exporters in this market segment will have to have two characteristics. The first is the ability to built up an international network of co-operations and partnerships that (although on a smaller scale), has the same capabilities as the networks of the multinationals. The second is a secure home market.

Note

The information provided in this presentation is prepared by Cement Distribution Consultants to the best of its knowledge and ability but is not guaranteed to be fully accurate.

Enquiry no: 8