

# Seaborne Cement trade in the Indian Ocean and Middle East

## Consequences for port developments

Ad Ligthart

Cement Distribution Consultants  
The Netherlands



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- Overview of cement trade in the region
  - History
  - Present situation
  - Future developments
- Consequences for port development
  - Present situation
  - Logistics
  - Available loading systems



## Seaborne cement trade in the Indian Ocean and Middle East

### Historical developments

- Oil crisis in seventies with consequent high oil prices creates huge cement demand in Middle East
- This is followed by substantial construction of new cement plants
- The region becomes an exporter
- An active internal trade within the region evolves first in bags but later more and more in bulk
- Special position of Marine Cement (Lafarge) supplying island nations and East African markets
- Evolvement of India as a large exporter (90's)
- High oil prices create huge demand for cement in Middle East

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## Seaborne cement trade in the Indian Ocean and Middle East (excluding clinker)

Present situation (2004)

*Importing countries (est.)*

Myanmar	1 million tpy
Sri Lanka	0,6 million tpy
Iraq (via Kuwait)	0,5 million tpy
Kuwait	0,3 million tpy
Bahrain	0,65 million tpy
Qatar	0,15 million tpy
United Arab Emirates	0,8 million tpy
Yemen	1 million tpy
Sudan	0,4 million tpy
East Coast Africa	0,5 million tpy
Mauritius	0,75 million tpy
Other island nations	0,45 million tpy

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## Seaborne cement trade in the Indian Ocean and Middle East (excluding clinker)

Present situation (2004)

*Exporting countries (est.)*

India	4,9 million tpy
Pakistan	1 million tpy
Iran	0,3 million tpy
Oman	0,5 million tpy
Saudi Arabia	1,1 million tpy
United Arab Emirates	0,6 million tpy
Kenya	0,2 million tpy
Egypt (Red Sea)	0,2 million tpy
Malaysia	0,6 million tpy

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## Seaborne cement trade in the Indian Ocean and Middle East (excluding clinker)

Present situation (2004)

General info

Seaborne cement trade within the region	6,7 million tpy
Seaborne cement trade entering the region	0,2 million tpy
Seaborne cement trade leaving the region	2,9 million tpy
Domestic seaborne cement distribution in India	4 million tpy

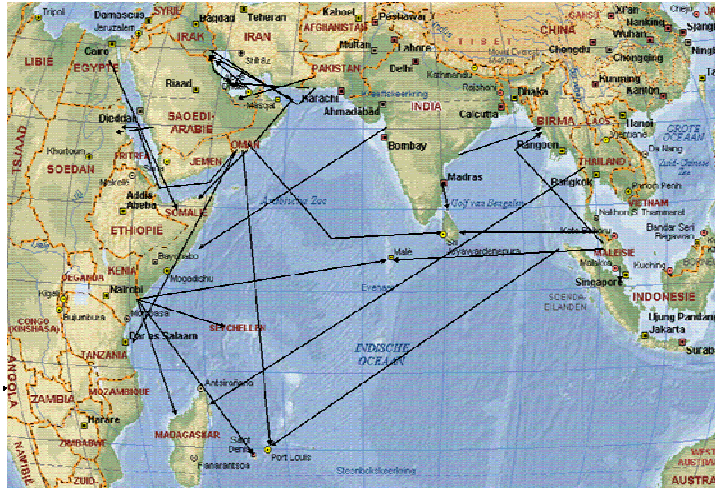
Total seaborne transportation in region 13,8 million tpy

Approx. 3,8 million tpy regional cement trade transported by self discharging ship

Approx. 4 million tpy transported domestically in India by self discharging ship

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## Seaborne cement trade in the Indian Ocean and Middle East Present situation



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Trade flows

## Seaborne cement trade in the Indian Ocean and Middle East

Future outlook - Cement capacity under construction

	Consumption 2004	Up to 2007 new capacity
India	129.640 m	20 m
Pakistan	15.000 m	19 m
Iran	34.000 m	10 m
Kuwait	2.240 m	0,7 m
Qatar	1.477 m	1 m
Saudi – Arabia	25.480 m	13,7 m
United Arab Emirates	8.000 m	6,7 m
	<b>215.837 m</b>	<b>70.1 m</b>

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**Present consumption  
of exporting countries  
in region (2004)**

215,8 million tpy

**New capacity  
by 2007  
in these exporting countries**

70,1 million tpy

Even in the most optimistic scenario these countries will be unable to absorb this new capacity.

In 2007 there will be a very large surplus of production capacity.

**Can this cement be exported?**

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### Potential within the region (as from 2007)

#### Gulf area

Decline in imports!!  
(Unless Iraq substantially increases seaborne imports)

#### East Africa

Moderate growth in imports only

#### Rest of region

Moderate growth in imports only

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## New export markets have to be found outside the region

### What are the possibilities?

#### East and South East Asia

This region will have less cement available for export (Unless China expands its export capability) and some countries will start importing again

#### USA

Large import volumes. Potential to replace East and South East Asia as largest supplier

#### Mediterranean

Continuing tight supply situation but Suez Canal is a barrier. Most terminals can only receive small ships

#### West Africa

Growing market

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## The best opportunities for increased exports are outside the region

Requirement: Shipping large (Handymax) bulk carriers

Main restriction in the region: Under developed ports

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## Global shipping of cement requires handymax vessels

Requirements	40.000 – 55.000 Dwt
Storage facility	> 60.000 tons
Ship loader capacity	600 – 1.500 tph

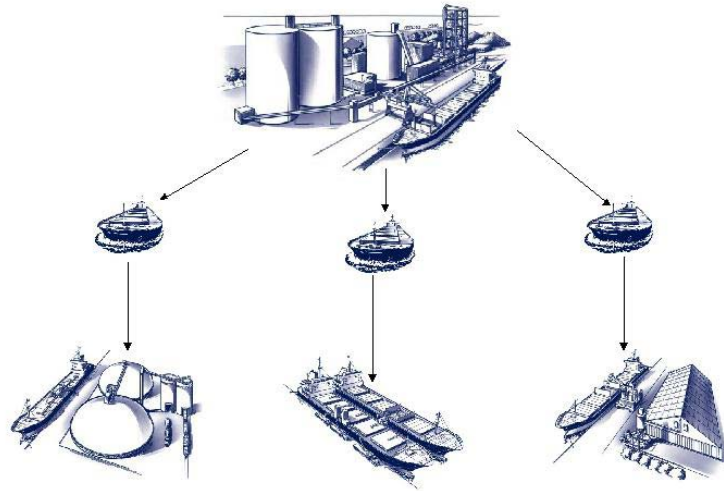
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## Present port situation in exporting countries

Saudi Arabia	Already several ports with very good cement exporting facilities but expansion will be required.
United Arab Emirates	Good export facilities at Ras el Kaima but mainly oriented to ward loading self unloading ships. Bulk carrier loading facilities to be added.
Iran	New export terminal being built but insufficient for scheduled exports of 3 million tons per year in 2007.
India	Some cement plants on waterside with bulk carrier loading capabilities but increased exports (and seaborne domestic transport) will have to be made via general ports which are very much congested.
Pakistan	No cement plants on waterside. At present there is only loading capability of clinker and bagged cement.

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## The basis for port developments Logistics !



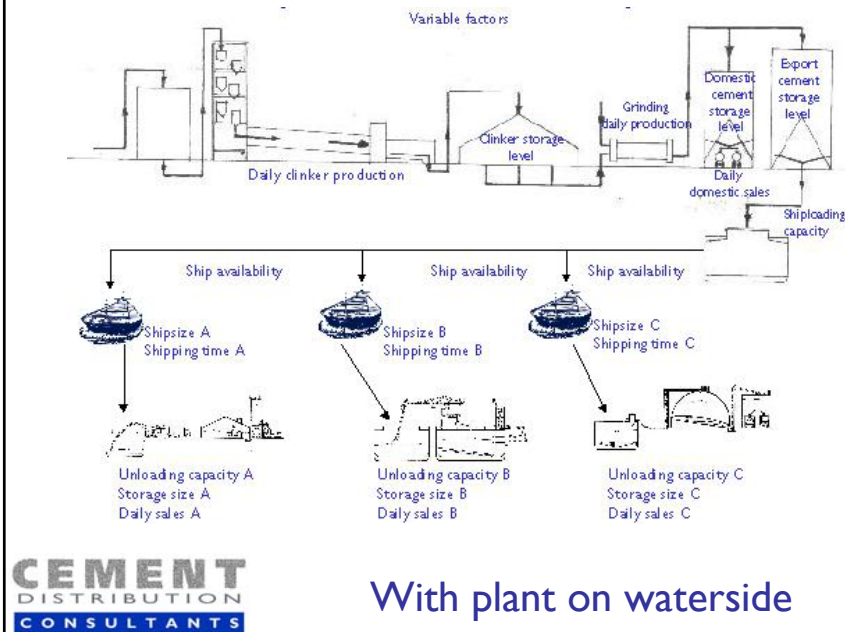
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The design of a cement export facility is fully dependent on the logistics how the cement is supplied to the export facility and the logistics of the transportation from the export facility to its markets based on a forecast of 10 – 20 years

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## Logistical factors of cement exporting



## Other logistical factors

- Required types of cement for export  
(Possible multiple storage compartments)
- Required size of storage facility
  - Ship size(s)
  - Irregularity of ship arrivals (Multiple customers)
  - Daily production capacity for export
- Required type and capacity of ship loader
  - Other activities on dock
  - Type and size of ships to be loaded
  - Available dock length

However, within the region there are not many plants located on the waterside

The alternative is to use a general port and supply the cement and clinker to the port by

- Road
- Rail
- Barge

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### Examples of ship loading Systems I Direct ship loading with bulk trucks



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## Direct loading with bulk trucks

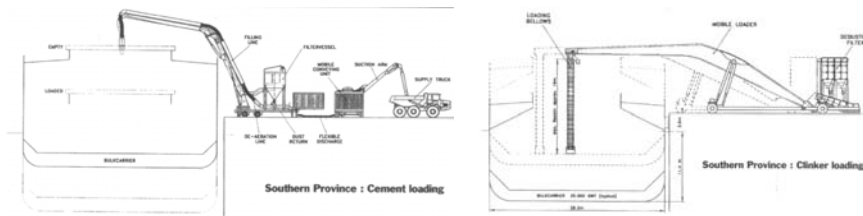
- Virtually no capital cost involved in port facilities
- High loading rates are possible
- Dock free for other operations after cement loading

But

- Very large number of bulk trucks required
- High operating costs
- Large storage facility and truck loading stations required at cement plant

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## Examples of ship loading systems 2 Cement and clinker by tipper truck to port and directly loaded to ship



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Cement and clinker by tipper truck to port and directly loaded to ship

- Only (mobile) ship loader required in ports
- High Loading rates possible
- Dock free for other operations after cement / clinker loading

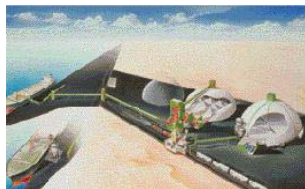
But

- Large number of trucks required
- Moderately high operating costs
- Large storage facility and truck loading facilities required at cement plant

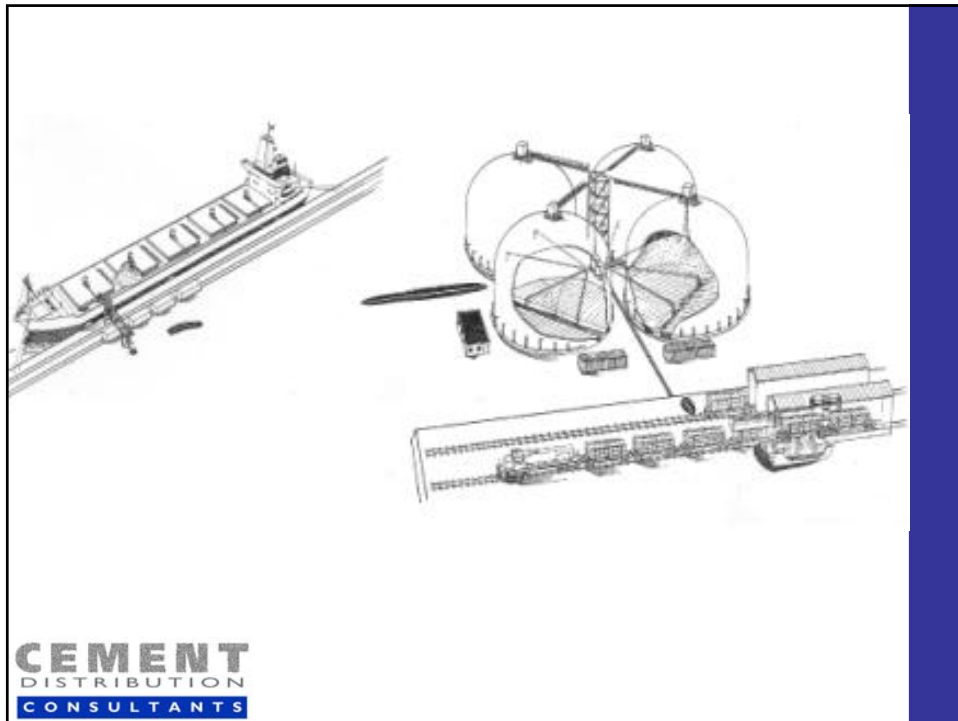
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### Examples of ship loading systems 3

#### Railcar and truck transport to port – storage and ship loading



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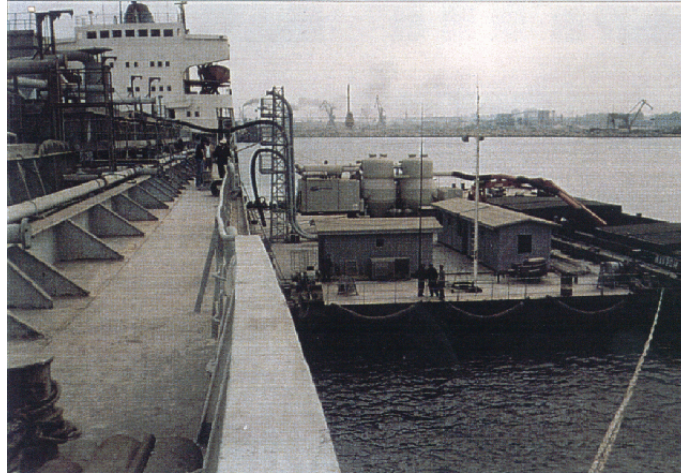


### Rail transportation

- Substantial lower transportation cost than trucks
- Requires reliable rail infrastructure and services
- Requires large storage facility in port and substantial material handling equipment

## Examples of ship loading systems 4

### Barge to ship transfer



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## Barge transportation to port or river delta

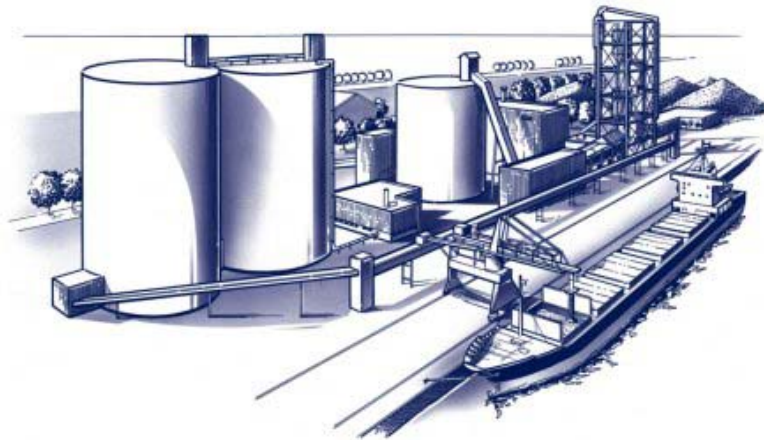
- Very low transportation costs of cement
- No facilities required in port other than midstream buoys for transshipment
- Large storage facility and barge loading facilities required at the cement plant

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## Examples of ship loading systems 5

### Cement plant on waterside (Ideal situation)



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## Fixed airslide loading systems



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## Railmounted mechanical ship unloader



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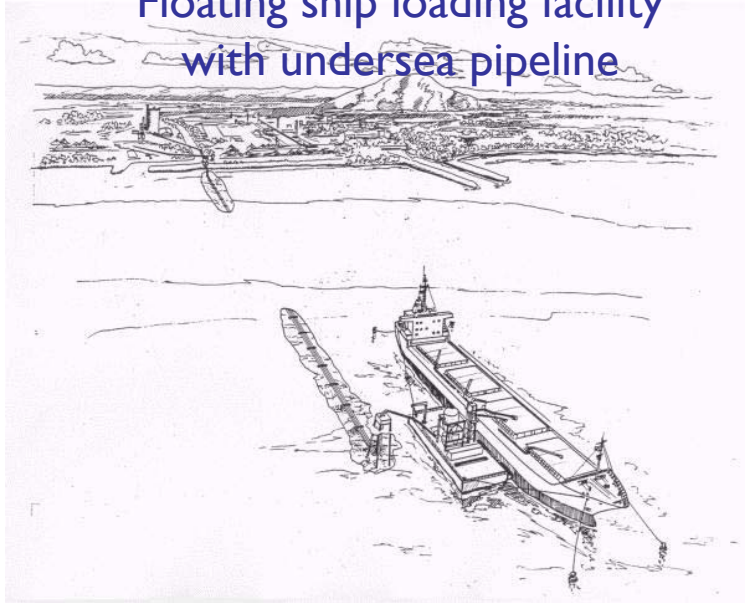
## Railmounted pneumatic ship loader



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## Floating ship loading facility with undersea pipeline



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Requires sheltered anchorage

## Conclusion

The amount of cement available for export in 2007 and following years exceeds by far what the region can absorb.

The additional export quantities will have to be aimed at the global market.  
The region has the ability to replace East and South East Asia as the main source for export cement.

This requires the capability to load large bulk carriers (as well as smaller (self unloading) vessels for the region itself.

At present the exporting countries in the region have insufficient facilities to export these additional cement volumes.

Simultaneously with the construction of new cement production facilities the port facilities to export the surplus cement capacity have to be developed.

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# Thank you !

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