Global seaborne cement and clinker trade

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Cement Distribution Consultants

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  ➢ The issue with global cement trade statistics
  ➢ What is cement?
  ➢ Methodology to determine trade statistics
  ➢ The economics behind cement and clinker exports
  ➢ A few general remarks

• Regional overview with information on seaborne trade and domestic distribution, shipping methods and facilities
  ➢ Europe
  ➢ Africa and Middle East
  ➢ North America
  ➢ South America (incl. Caribbean)
  ➢ North East Asia
  ➢ South East Asia
  ➢ South Asia / Indian Ocean
  ➢ Australia / New Zealand

• Global summary
Cement Distribution Consultants
an introduction

<table>
<thead>
<tr>
<th>Market knowledge</th>
<th>Consulting</th>
<th>Project / interim management</th>
</tr>
</thead>
<tbody>
<tr>
<td>• The global cement industry on Google Earth</td>
<td>Logistical, economical and technical services</td>
<td>Realising and managing projects</td>
</tr>
<tr>
<td>• Large database on waterside cement plants, waterside grinding plants and terminals</td>
<td>• Feasibility studies of complete logistical chains for trade and distribution</td>
<td>Examples</td>
</tr>
<tr>
<td>• 30 Years experience</td>
<td>• Shipping solutions</td>
<td>- Redevelopment of large “brown field” bulk terminal</td>
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<td></td>
<td>• Development of new facilities</td>
<td>- Temporary cement and fly ash import project for construction of large concrete dam</td>
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<td>• Terminal and equipment design</td>
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The issue with official cement and clinker trading figures

When adding up the global cement and clinker export and import figures as provided by all national cement associations exports are 20% larger than imports. What is happening here?

A lot of clinker and cement imports are not reported!!

There is often no separation between clinker and cement exports and for cement no separation in bulk, big bags or paper bags.

National cement associations often do not report imports by independents.

Clinker replacement materials (PFA, GBFS, etc.) are not covered in statistics.
What is cement?
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Methodology of determining seaborne import and export figures

- Production and export figures are more reliable than consumption and (clearly) import figures.

- Work from countries with highly reliable figures first and after that start putting together the rest of the puzzle.

- Build up a clear picture of clinker production and cement production of each country and determine the clinker factor in cement and with that export capabilities / import requirements.

- Bulk cement and clinker require dedicated facilities for seaborne exports and imports. When you know the facilities and their ownerships you can establish the trading networks and cement and clinker flows.
To answer these questions, Cement Distribution Consultants has put the global cement industry on Google Earth.

- The cement plants that export by sea?
- The grinding facilities receiving clinker by sea?
- The cement terminals along coasts and rivers?
- How are trading networks build up? How do they enhance the landlocked plants behind them?
- How do seaborne trade and seaborne domestic distribution interact?
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The cement industry on Google Earth

Large database on waterside plants, grinding facilities, terminals and self discharging ships. Basis for market studies, shipping studies, etc., etc.
The cement industry on Google Earth
Europe
Cemex Nordic Network
Cemex
Nordic Network Supply bases

Cemex, Rudersdorf plant

Cemex, Broceni plant

Cemex, Rostock loading facility

Cemex, Liepaja
Cemex
Nordic Network Surte Terminal
Some other examples of the database

Dangote cement terminal Tema, Ghana
Some other examples of the database

- Lafarge ship loading in Nice, France
- Kangan cement plant, Iran shiploading
Seaborne cement and clinker trade
Regional overviews
Europe

Seaborne cement and clinker trade overview

- 66 Cement plants involved in seaborne exports
- 221 Terminals receiving sea going vessels
- 36 Grinding terminals receiving clinker and / or slag by water

Facilities overview

<table>
<thead>
<tr>
<th>Description</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Traded within Europe</td>
<td>12.3 mt</td>
</tr>
<tr>
<td>Exported to other continents</td>
<td>11.4 mt</td>
</tr>
<tr>
<td>Imports from other continents</td>
<td>-</td>
</tr>
<tr>
<td>Waterborne domestic distribution</td>
<td>17.9 mt</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>41.9 mt</strong></td>
</tr>
</tbody>
</table>

323 Total of facilities
Facilities overview

- 84 terminals
- 10 cement plants involved in trade/distribution by sea
- 2 coastal grinding plants

Terminals

- Terminal size 2,000 – 20,000 tons
- Almost all are silo terminals
- All are suitable for self discharging ships
- Almost no ship unloaders in the region

Overview

- 4 Large trading networks:
  - Heidelberger
  - Cemex
  - Finncementi (CRH)
  - Aalborg (Cementir)

Seaborne transportation

- International trade within region: 1,4 mt
- Domestic distribution: 3,8 mt
- International trade outside region: 2,2 mt

Total: 7,4 mt

Quantity transported by self discharging ships: 5,6 mt

Nordic area
Facilities overview
Cement terminals 63
Cement plants involved in trade / distribution by water 19
Coastal grinding plants 25

Terminal sizes typically range between 5,000 – 12,000 tons.
A few terminals with approx. 20,000 tons.
Four terminals 40,000 – 65,000 tons.

About 35% of terminals has a ship unloader and is capable to receive regular bulk carriers.

10 Trading networks
- Lafarge - Tudela
- Heidelberg - Cimpor
- Holcim - Secil
- Cemex - Lagan
- CRH

Waterborne transportation
- Internationally traded within region 5,5 mt
- Domestic waterborne distribution 8,6 mt
- Internationally traded outside region 1,5 mt
- Total volume 15,9 mt

Total cement volume transported by self discharging ships 11,3 mt

A lot of domestic distribution by water in The Netherlands, Belgium, France and Germany is done by inland (self discharging) barges.

Atlantic area
Facilities overview
- Cement terminals: 100
- Cement plants involved in trade / distribution by water: 38
- Coastal grinding plants: 25

Terminal sizes typically range between 5,000 – 12,000 tons and are a mix of silos and flat storage terminals. There are a few floating terminals in North Africa.

About 50% of terminals is equipped with a ship unloader.

### Trading networks

<table>
<thead>
<tr>
<th></th>
<th>Lafarge</th>
<th>Cemex</th>
<th>Heidelberg</th>
<th>Holcim</th>
<th>Valderivas</th>
<th>Italcimenti</th>
<th>Cementir</th>
</tr>
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</table>

### Seaborne transportation

<table>
<thead>
<tr>
<th></th>
<th>International trade within region</th>
<th>Seaborne domestic distribution</th>
<th>International trade outside region</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Lafarge</td>
<td>5.4 mt</td>
<td></td>
<td></td>
<td>5.5 mt</td>
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<tr>
<td>- Titan</td>
<td></td>
<td></td>
<td></td>
<td>7.7 mt</td>
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<tr>
<td>- Cemex</td>
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<tr>
<td>- Colacem</td>
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<tr>
<td>- Heidelberg</td>
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<td>- Cimsa</td>
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<td>- Holcim</td>
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<td>- Buzzi</td>
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<td>- Valderivas</td>
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<td>- Oyak</td>
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<td>7.7 mt</td>
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<td>- Italcimenti</td>
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</tr>
<tr>
<td>- Nuh</td>
<td></td>
<td></td>
<td></td>
<td>7.7 mt</td>
</tr>
<tr>
<td>- Cementir</td>
<td></td>
<td></td>
<td></td>
<td>18.6 mt</td>
</tr>
</tbody>
</table>

Quantity transported by self discharging ships: 8.2 mt
Self discharging ships in Med. Region: 42
- 12 Cement plants capable for seaborne trade (8 in North Africa)
- 30 Bulk cement terminals (14 in Atlantic Islands) (8 terminals in Nigeria closing)
- 33 Grinding plants receiving clinker by sea

75 Total of facilities
Middle East

- Lebanon
- Israel
- Syria
- Jordan
- Iraq
- Kuwait
- Bahrain
- Qatar
- Saudi Arabia
- Oman
- U.A.E.
- Yemen

- 12 Export bases
- 14 Cement terminals
- 3 Grinding plants receiving clinker by sea

29 Total of facilities
Shipping volumes

- 31,2 mt of cement and clinker moving around Africa and Middle East consisting of:
  - 11,5 mt from Europe
  - 8,7 mt from Asia
  - 6,0 mt within Middle East
  - 2,0 mt within Africa
  - 3,0 mt from ME to Africa

- 31,2 mt of cement and clinker:
  - 15,1 mt clinker (regular bulk carriers)
  - 9,9 mt bagged cement (regular bulk carriers)
  - 6,2 mt bulk cement (35% regular bulk carriers, 65% self discharging ships)

Africa and Middle East
Typical terminals
- Small size terminals 5,000 – 12,000 in Canary islands, Madeira, Cap Verde, Sudan, Yemen, Oman
- Combination of silos and flat storage facilities
- About 40% of the terminals has a ship unloader
- Large terminals in Nigeria (but closing), Ghana, Kuwait and Qatar (under construction) all with ship unloaders (or grab and hopper)
2012

Seaborne imports 3,35 mt
Great Lakes trade 2,1 mt
Great Lakes distribution 0,8 mt
Inland waterways distribution 7,5 mt
Exports!!! 0,9 mt
Total waterborne shipments 14,7 mt
North America

- 30 Integrated plants with on site ship / barge loading facilities
- 1 Integrated plant railing cement to ship loading facility
- 1 - 2 Integrated plants trucking cement to port and directly into ships
- 73 Terminals receiving ocean going bulk vessels
- 20 Great Lakes terminals
- 50 River terminals
- 13 Grinding plants receiving clinker and/or slag by water

189 Total of facilities
Great Lakes

- 4 Networks
  - Lafarge
  - Holcim
  - St. Mary’s
  - Essroc
  - 20 terminals

- 6 Waterside plants

- 8 Grinding facilities

- 7 Self discharging ships

- 2 Large push barges

2,9 mt transported by water

2,0 mt by self discharging vessel
Coastal distribution

**North west**
- 4 Networks
  - Lafarge
  - Ashgrove
  - Lehigh
- Large push barges

**North east**
- Holcim
- Lafarge
- Lehigh (Heidelberg)
- Dragon
- Large push barges
- Self discharging ships

**South east**
- Cemex
- Holcim
- Lehigh
- Lafarge
Imports by sea

73 Terminals receiving ocean going bulk vessels. Of these terminals over 50 are equipped with a ship unloader.

Many terminals now mothballed or used for domestic distribution
Exports from the US

Since the end of 2009 the US has started to export cement to the Caribbean and recently even to Brazil. The exports are made from Florida using bulk trucks to transport cement to the port and blow it into the ship.
Caribbean
- 17 Cement plants involved in seaborne trade and distribution
- 15 Terminals receiving ocean going bulk vessels
- 6 Grinding plants receiving clinker and/or slag by water

38 Total of facilities

South America
- 8 Cement plants capable for seaborne trade and distribution
- 1 Terminal receiving ocean going vessels
- 7 Grinding plants receiving clinker and/or slag by water

16 Total of facilities

Central America and Caribbean
Caribbean

3 Trading networks
- Argos
- Cemex
- TCL

3 Million tons traded regionally by sea of which 2.1 mt by self discharging ships

Typical terminals

The Caribbean has got a wide range of terminals ranging between 2,000 – 10,000 storage. All of them are supplied by self discharging ships. Most of them are silo terminals plus a few flat storage.
South America

- No bulk cement sea transportation on west coast (only clinker and bagged cement imports)
- Only west coast bulk cement transport is Cemex. Imports into Manaus from Port Everglades using mv Glory Ocean since early 2013
Regional overview
North East Asia

Total exports in area  35,3 mt
of which :
• Imported within the area  8,0 mt
• Exported to Asia – Australia region  16,6 mt
• Global exports  10,7 mt

Domestic distribution
Japan  22 mt
South Korea  9,0 mt
China  ?? mt
Hong Kong  2,3 mt
Taiwan  5,2 mt
Total  38,5 mt + China

Total waterborne cement and clinker movements in area 73,8 mt + China domestic of which 62 mt by self discharging ship

Cement and clinker trade flows in Asia
### Regional overview - South East Asia

<table>
<thead>
<tr>
<th>Total exports in area</th>
<th>19.7 mt</th>
</tr>
</thead>
</table>

#### Total imports
- From within the area: 4.3 mt
- From within the Asia – Australia region: 7.1 mt

#### Total exports outside the area
- To the Asia – Australia region: 10.6 mt
- Global exports: 3.2 mt

#### Domestic distribution by water
- Philippines: 2.2 mt
- Vietnam: 9.2 mt
- Malaysia: 0.6 mt
- Thailand: 0 mt
- Indonesia: 11 mt

**Total**: 23 mt

Approx. 22 million tons transported by self discharging cement carriers

**Cement and clinker trade flows in Asia**
### Regional overview
#### South Asia

**Total exports in area**: 3,4 mt

**Total imports**
- From within the area: 1,85 mt
- From within the Asia – Australia region: 18 mt

**Total exports outside the area**
- To the Asia – Australia region: 0 mt
- Global exports: 0,9 mt

**Domestic distribution by water:**
- **Bangladesh**: 10 mt (all clinker)
- **India**: 5 mt
- **Sri Lanka**: 0,5 mt
- **Total**: 15,5 mt

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Approx. 9 million tons transported by self discharging cement carriers

**Cement and clinker trade flows in Asia**
Regional seaborne exports
Global seaborne exports
Waterborne domestic distribution
Total
46 mt
52 mt
106 mt (excl. China)
204 mt
Coming Soon!!

The ICR Handbook on Global Cement Trade and Distribution

- Overview of Global cement and clinker trade
- Country and regional cement trade analysis and statistics
- Fully illustrated with detailed colour maps indicating material flows and trading networks
- Cement shipping and distribution economic
- Review of cement terminal design and operation
- Terminal directory

Authors:
THANK YOU

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