

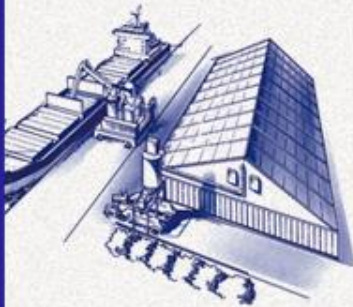
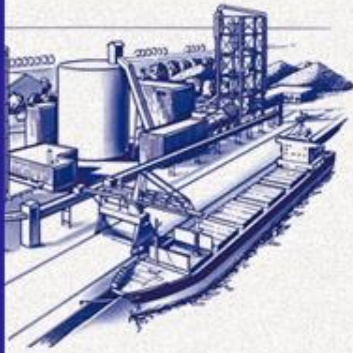


# Current developments in the cement industry and the consequences for cement and clinker shipping

Ad Ligthart

INTERCEM Shipping, Marseille, January 24, 2017

**CEMENT**  
DISTRIBUTION  
CONSULTANTS



# Cement Distribution Consultants an introduction

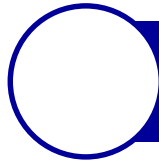
Market knowledge	Consulting	Project / interim management
<ul style="list-style-type: none"> <li>The global cement industry on Google Earth.</li> <li>The most comprehensive global database on waterside cement plants, waterside grinding plants and terminals.</li> <li><a href="http://www.cementdistribution.com">www.cementdistribution.com</a> (a free and comprehensive website on cement trade and distribution).</li> <li>Authors of the Handbook on Global Cement Trade and Distribution.</li> <li>34 Years experience.</li> </ul>	<ul style="list-style-type: none"> <li>The ability to advise customers on every aspect of cement and clinker trade and distribution including strategical, economical, logistical, technical and operational aspects as well as sourcing, shipping, facilities, handling systems, etc., etc.</li> <li>A clear vision on port and facility design that can adapt to changing trade and industry conditions.</li> <li>Projects realised on every continent.</li> <li>Currently consultant to the two largest cement terminals in the world.</li> </ul>	<ul style="list-style-type: none"> <li>Substantial experience in realising projects and managing complete logistical chains.</li> <li>Examples: <ul style="list-style-type: none"> <li>Setting up and managing the cement and fly ash supply to a large construction project including self-discharging cement carriers, floating terminal, etc.</li> <li>Redevelopment of a large brown field bulk terminal.</li> <li>Setting up a fly ash import operating</li> <li>Resolving operational and managerial problems of a grinding facility.</li> </ul> </li> </ul>



# Contents of presentation

- China
- Clinker trade and grinding plants
- The big mergers
- Europe
- Africa
- North America
- Closing remarks





## China

The situation in China is the key determining factor in respect to global availability of cement and clinker for export and the related F.O.B. pricing.

### China cement industry in figures

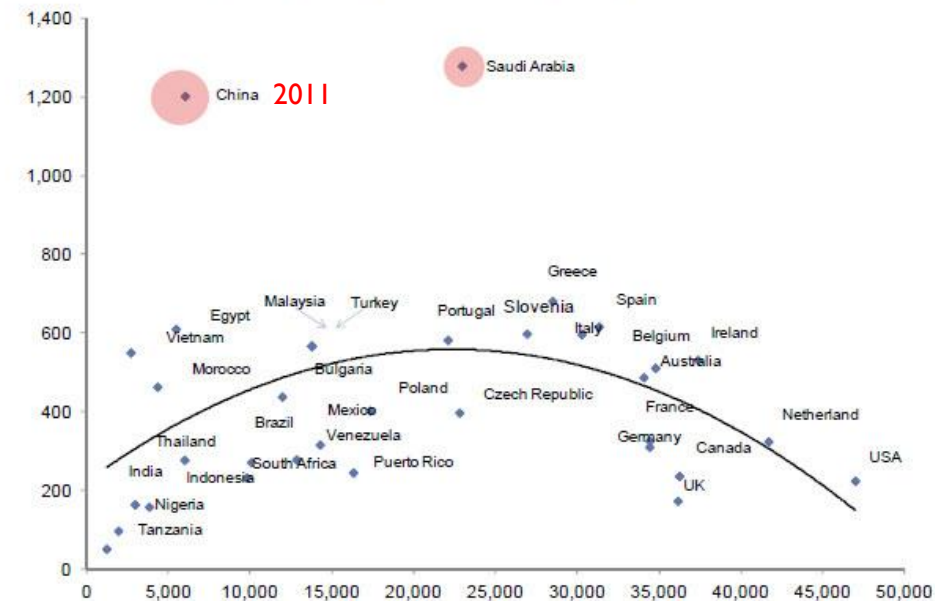
Production 2014	2.480 million tons (cement)
Production 2015	2.340 million tons (cement) (-5,6%)
Production 2016 (est.)	2.300 million tons (cement)
Cement cons. per capita	1.694 kg (3 x global average)

# China

● China 2015 1.694 kg

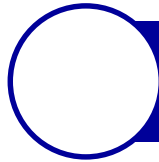
The concrete scowl

Cement consumption per capita vs. GDP per capita



Source: Global Cement report, International Cement review (2011 edition)

Cement consumption  
vs  
GDP per capita



## China

### Current situation

- 1600 integrated lines plus 2000 grinding plants
- Overall cement production capacity 3,5 billion tons
- Est. cement production 2016 2,3 billion tons
- Cement consumption per capita > 1650 kg

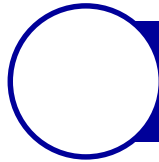
### 2035 forecast

- Cement consumption per capacity is 600 kg in 2035
- Cement consumption 2035 at 1,5 billion population approx. 1 billion tons
- Overall cement production capacity 2035 approx. 1,5 billion tons
- In 2035 approx. 600 integrated lines and 800 grinding plants

### Consequences

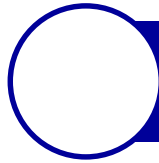
- Average drop in cement consumption of 70 million tons per year
- Average closure of 100 million tons of production capacity per year

Source: Institute of Technical Information of Building Materials Industry of China



## China

China will have a large surplus capacity available for the next 20 years. Exports will always be attractive in such a situation and that means that current low F.O.B. prices for cement and clinker are going to stay.



## Clinker trade and grinding plants

- China: Large surplus available for exports for the next 20 years
- Indonesia: 2017 production capacity 120 million tons  
2016 consumption (est.) 70 million tons
- Iran: Current prod. cap. 80 mt (exports 15 mt)  
Forecast 2025 120 mt
- Turkey, Vietnam, Pakistan keep adding capacity larger than domestic growth.
- Structural surpluses in South Europe, Middle East, Thailand, South Korea, Japan, etc.



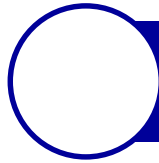
## Clinker trade and grinding plants

A glut of cement but especially clinker will be available for (seaborne) exports in the foreseeable future. F.O.B. pricing will remain low.

At present it does not make economical sense to build a new integrated cement plant within 200 km from a port. Importing clinker (or cement) is a more cost effective solution.

(Note: Bulk cement requires dedicated export and import facilities. Clinker can be handled by general ports. The number of cement plants with bulk cement ship loading capabilities is limited. Clinker can be supplied by any cement plant within a reasonable distance from a port.)





## Clinker trade and grinding plants

Grinding plants in the past required a substantial investment and a long realisation period. However, there are a lot of developments in this field.

- “Mini” plants. Small modular (containerized) plants with a low capital cost and short realisation time.
- Modular construction of large grinding plants reducing overall costs and realisation time.

## Clinker trade and grinding plants



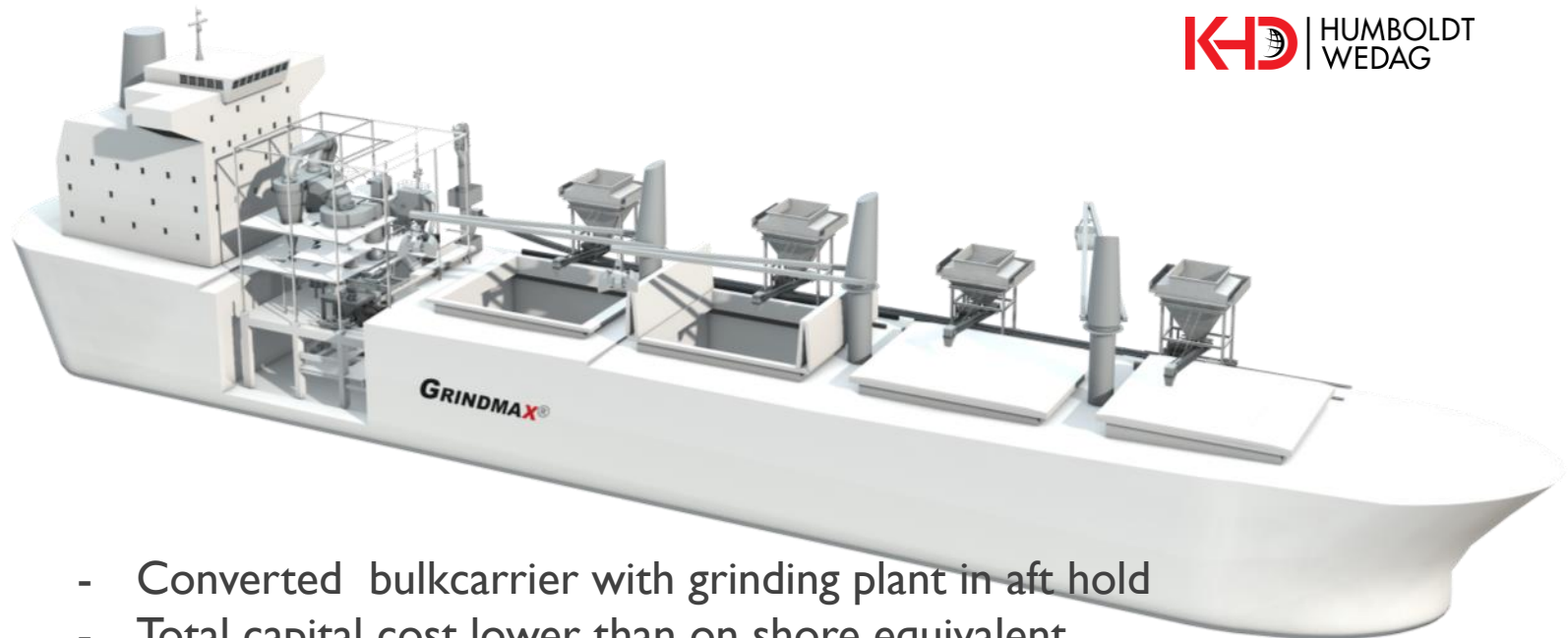
Plug & Grind mini plants from Cemengal.

P&G Classic up to approx. 100.000 tons per year

P&G XL up to 230.000 tons per year

## Clinker trade and grinding plants

KHD | HUMBOLDT  
WEDAG

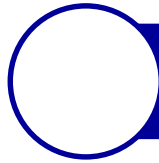


- Converted bulkcarrier with grinding plant in aft hold
- Total capital cost lower than on shore equivalent
- No land lease costs!
- Does not require a dock (either floating pipeline to shore or onward cement distribution by barges)

Possibilities with large modular grinding plants

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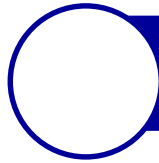




## The big mergers

Out of the 5 multinationals with the largest seaborne grade and distribution networks, LafargeHolcim and Heidelberg – Italcementi have merged.

LafargeHolcim has approx. 200 coastal facilities. (approx. 16% of global total) and Heidelberg approx. 135 (approx. 11% of global total). This is quite a concentration of power.

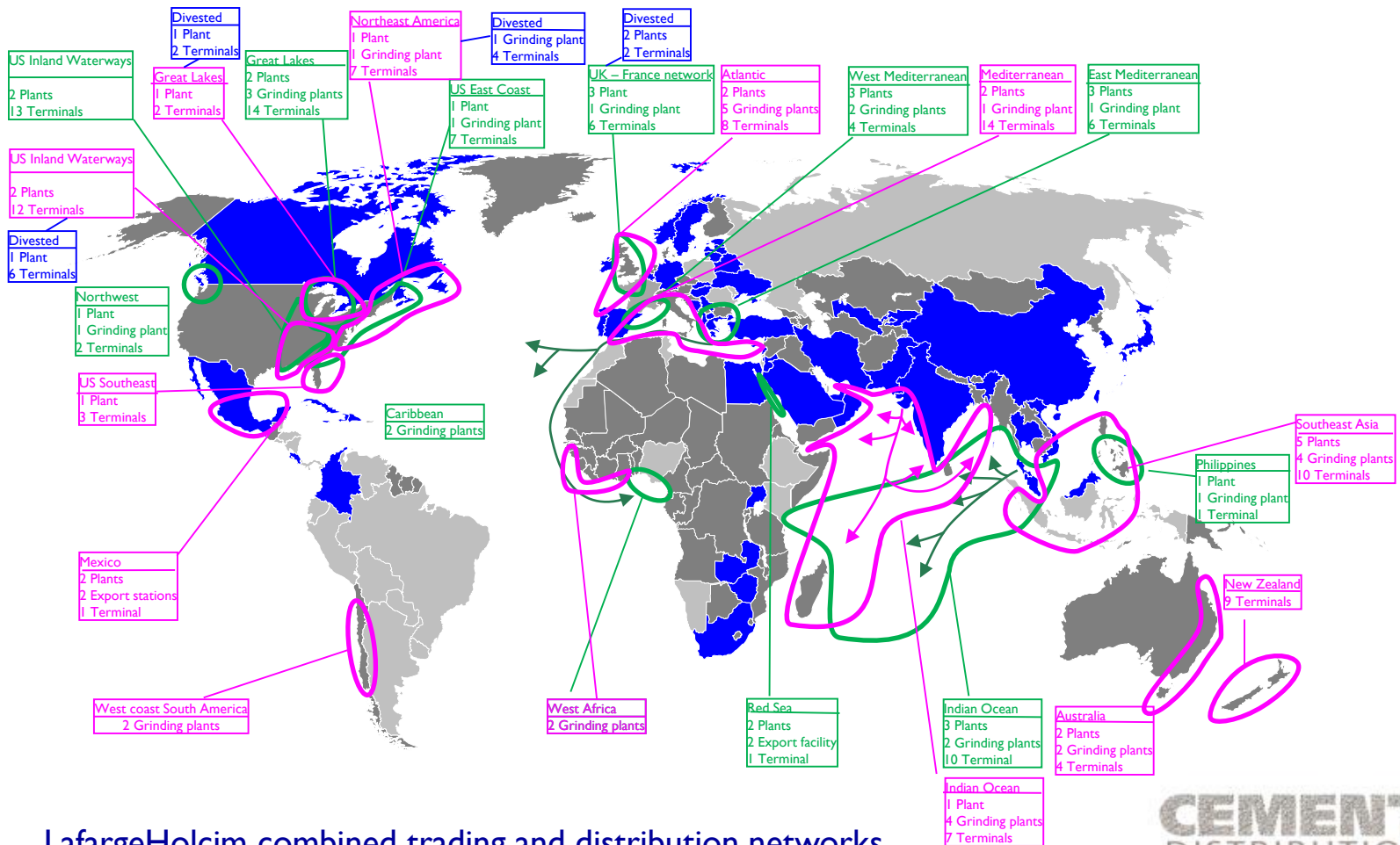


## The big mergers

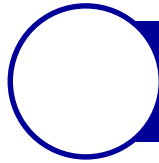
The combined LafargeHolcim global networks (shown on the next page), although the largest in the world, are far from optimal. There are large overlaps. In these regions often cement plants of either Lafarge or Holcim have been divested but the terminal facilities have been kept to protect the remaining plants from competitive imports. Overall utilisation of LafargeHolcim plant and distribution networks is low compared to industry averages.

In the US LafargeHolcim only has 3 terminals that are able to handle large bulkcarriers. The other terminals are for coastal distribution.

# The big mergers



LafargeHolcim combined trading and distribution networks



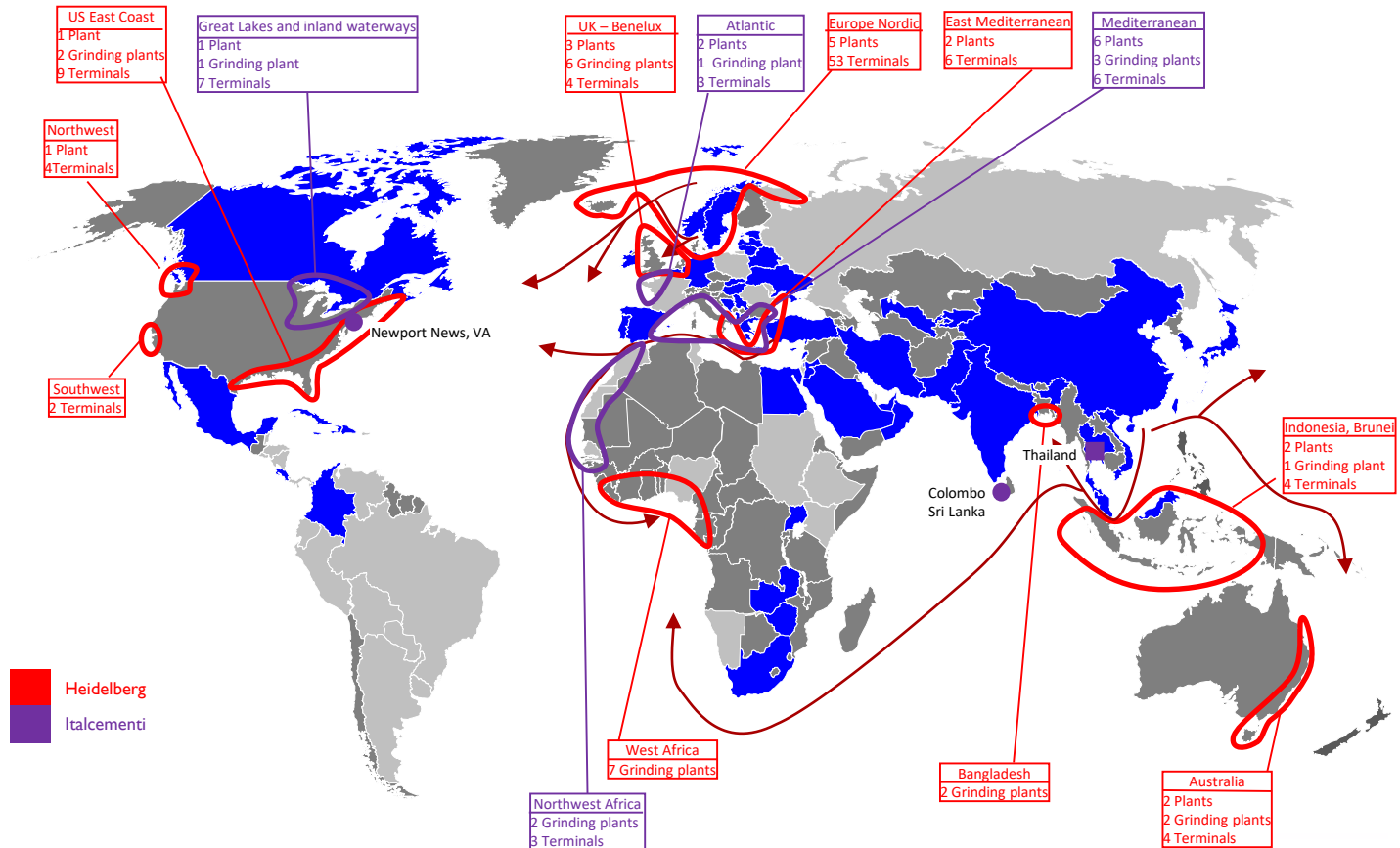
## The big mergers

The combined Heidelberg / Italcementi networks complement each other and as such the new Heidelberg network has gained significantly in power and synergy possibilities.

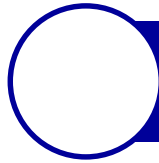
The networks protect and enhance the key regions in which the new Heidelberg is active and the North American and Africa networks which are the largest growth areas are very well covered.



# The big mergers



Heidelberg / Italcementi combined trading and distribution networks

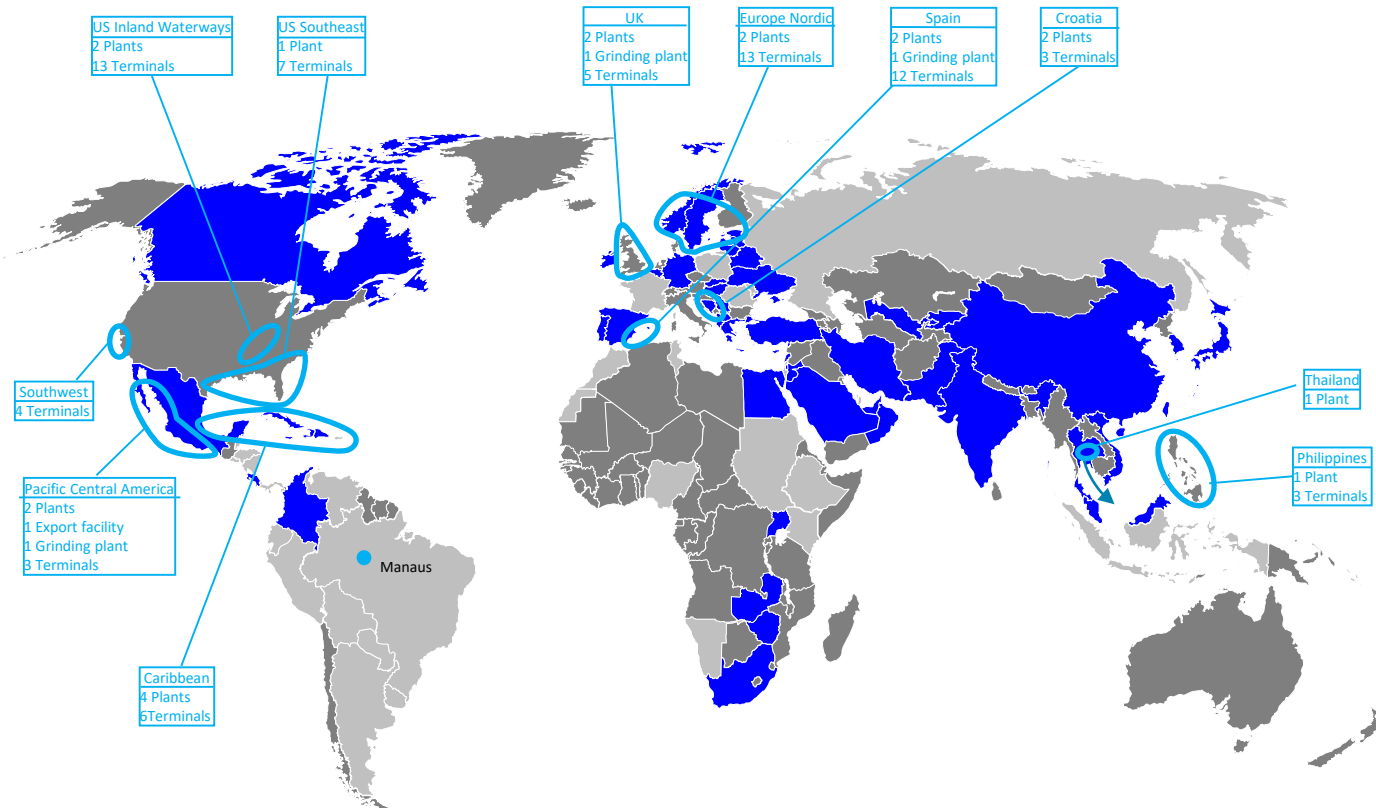


## The big mergers

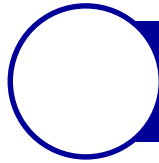
The global Cemex network is still quite strong. The individual networks protect and enhance the key regions in which Cemex is active.

The recent Cemex divestments are almost all isolated plants. Very few divestments have been made in its trade and distribution network and these were part of a rationalisation process.

# The big mergers



Cemex trade and distribution network



## The big mergers

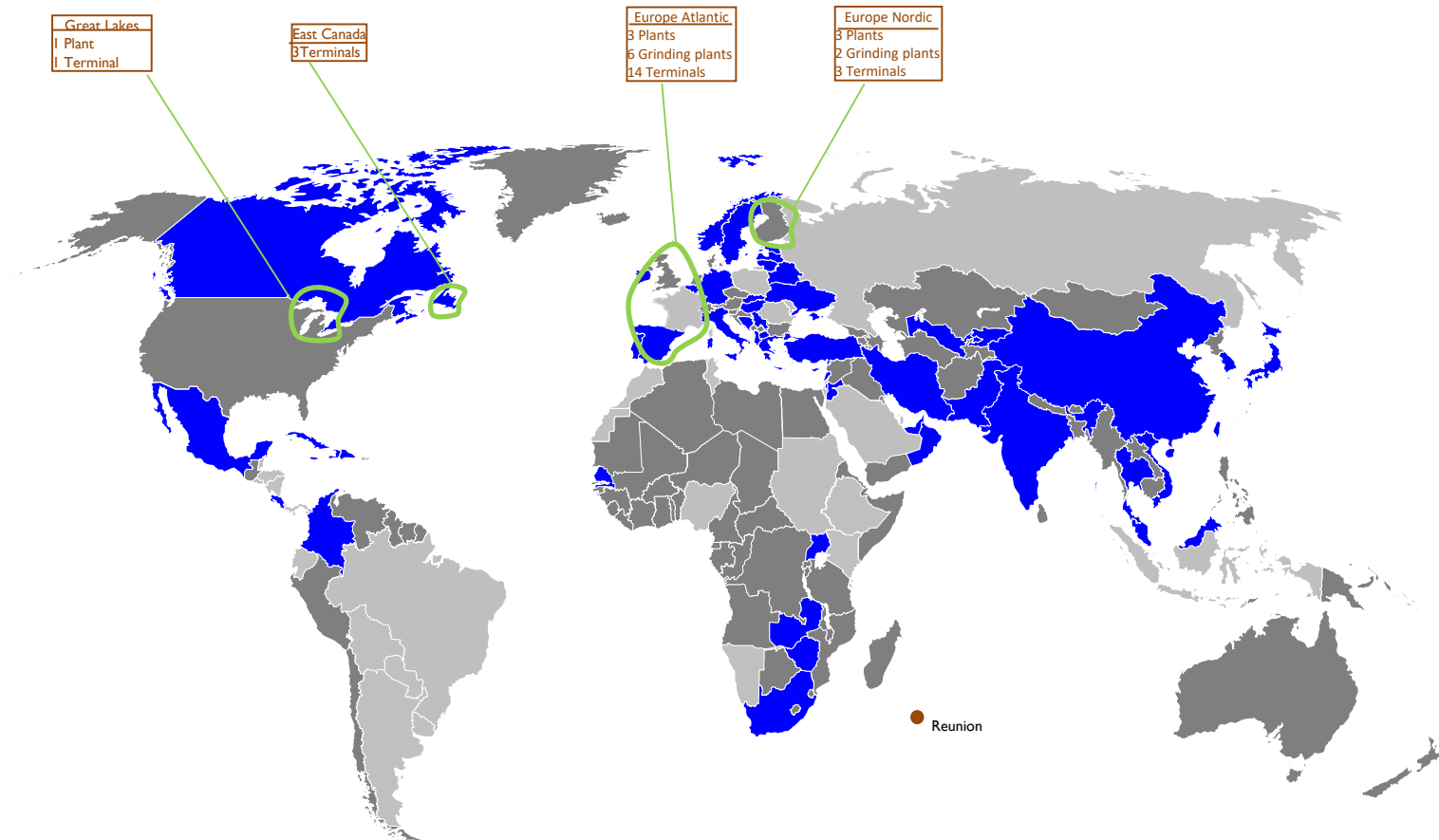
CRH has a very strong network in Europe that protects and enhances the performance of its plants.

It has acquired a large number of LafargeHolcim plants worldwide but with very few coastal facilities.

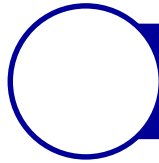
For a large multinational producer it has a very limited trade and distribution network and with that a very poor ability to improve the utilisation factor of its plants.

CRH





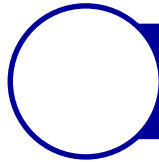
CRH trading and distribution networks



## Europe

In West Europe there is a healthy growth in construction and cement consumption and this trend looks to continue in the coming years. This means also an increase in seaborne trade and distribution volumes.

The ongoing closure or conversion to biomass fuels of coal fired power plants is creating shortages of fly ash. An increase of seaborne trade of cementitious materials is resulting from this.



## Europe

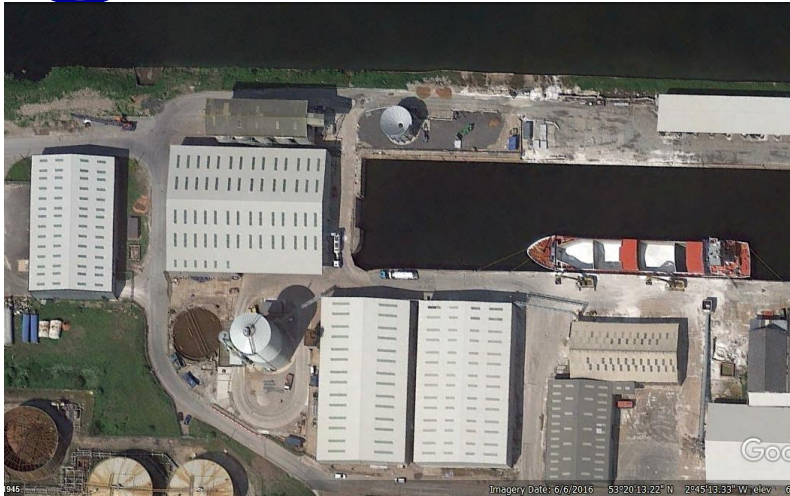
The growth of seaborne trading of both cement and cementitious materials is creating the need for new terminals and more self-discharging ships. Especially in the UK there are many new terminals.

New self-discharging ships are being delivered into the North European market but with the stricter environmental regulations a number of older vessels will have to leave this market area.

The increasing seaborne trade volume cannot be met fully by self-discharging cement carriers so the volume of cement and cementitious materials shipped by coastal bulk carriers is increasing and new (road mobile) ship unloaders are entering the market again.

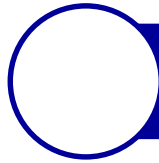
## Shipping aspects

## Europe



New terminals and ships



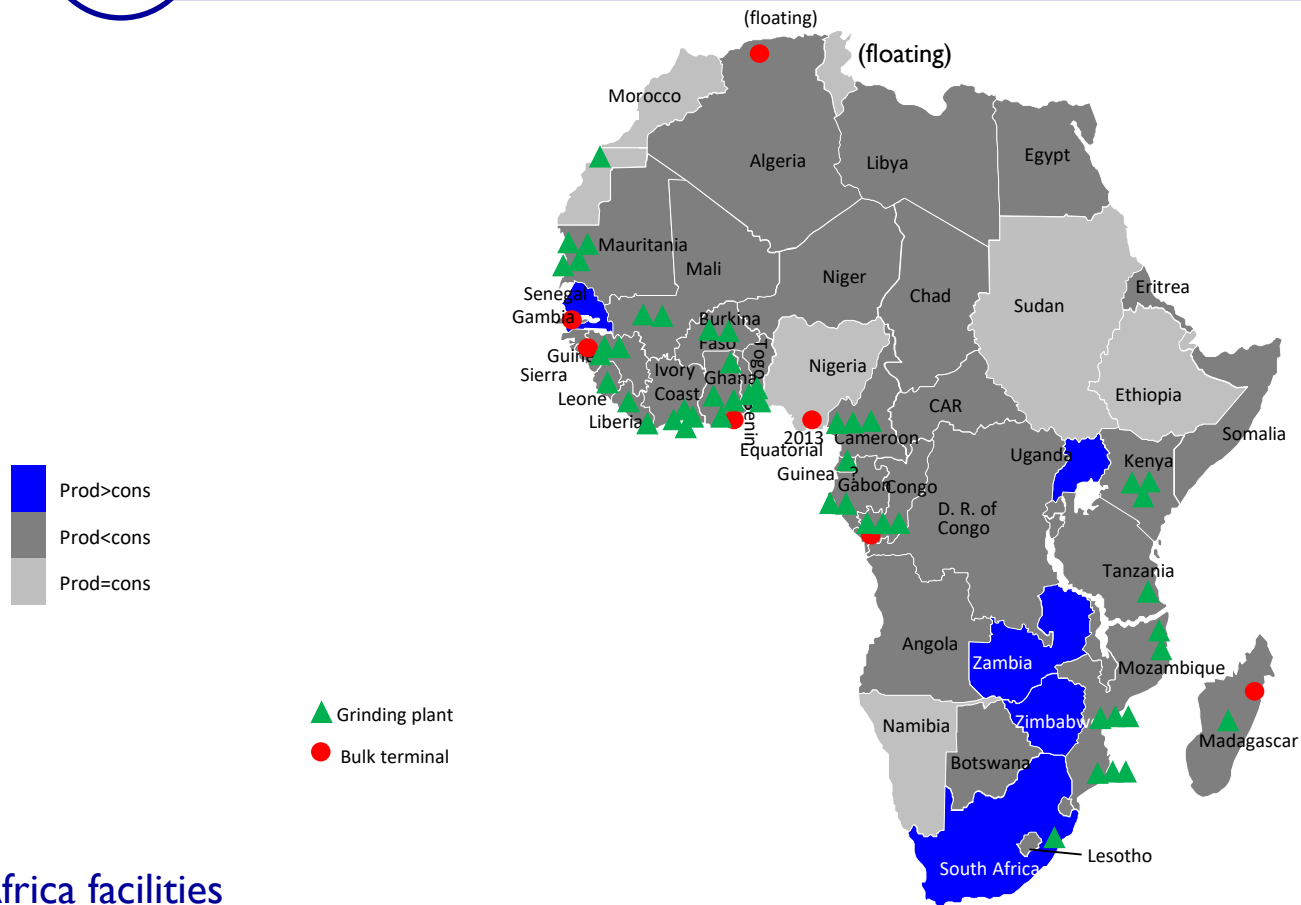


## Africa

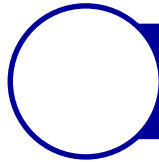
- Africa with its rapid population growth, economic progress and still very low cement consumption per capita is the only continent where a rapid growth of cement consumption is still possible.
- Everybody (cement producers, traders, local business groups) wants to be there and build plants to have a presence creating a large oversupply capacity.
- Integrated cement plants (which need continuous operation) are not very suitable for oversupply situations with low plant utilisation rates. Grinding plants (which can be switched on and off) can cope much better with low utilisation rates.
- Clinker imports for the foreseeable future can be realised at costs which are part or below domestic production costs.
- The grinding overcapacity will push back imports of bagged cement.
- The growth in Africa in cement consumption for larger part will be covered by clinker imports.

## Africa cement industry developments

# Africa

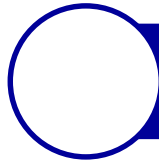


Africa facilities



## Africa

- Very few grinding plants in Africa are located within ports or have their own berth. Almost all use regular ports to import their clinker. These are congested and have many other problems as well.
- The explosive growth in new grinding plants is aggravating this even further. The plants on average, are located further and further away from the port.
- Port expansion, in general is slower than increase in port traffic. Ship size to most clinker receiving ports is still limed to Handysize and Handymax vessels. Port congestion is bound to stay.
- Creative solutions (ship to barge transfer, floating plants, etc.) could ease this situation.



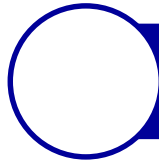
## North America

- Imports into the US are set to grow with 1,5 mt to 9,25 mt in 2016 and with probably another 2,0 mt in 2017 as current cement plants reach full utilisation rates, very few closed kiln lines re-open, further closures of old lines are taking place and new or expansion projects have been cancelled. All this in combination with a growing cement consumption.

A new infrastructure spending bill is likely to pass and will further enhance cement consumption.

- In 2006 the US imported by sea 31 million tons of cement. In theory just reopening mothballed import terminals should be sufficient. However, there are quite a bit of issues with the current terminal situation. New terminals and expansions of current facilities will be a requirement.
- Seaborne imports and seaborne distribution of cementitious materials in the US (and Canada) will increase.

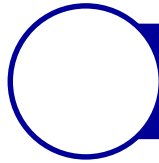




## North America

- Plant and terminal ownership are out of balance. For many US cement producers it will not be possible to keep their market share because they do not have (sufficient) import capacity. Cooperation agreements cannot cover this in the long term.
- Large US concrete producers will look to establish their own import operations (or grinding mills).
- US terminals were built for Handysize vessels. Few are really suitable for Supramaxes.
- Almost all US cement terminals are built for one type of product only.
- With hindsight it can be said that the design of many US cement import terminals lacked the flexibility (as well as other requirements) to cope with the fluctuations of trade and imports.

Issues with US terminal situation



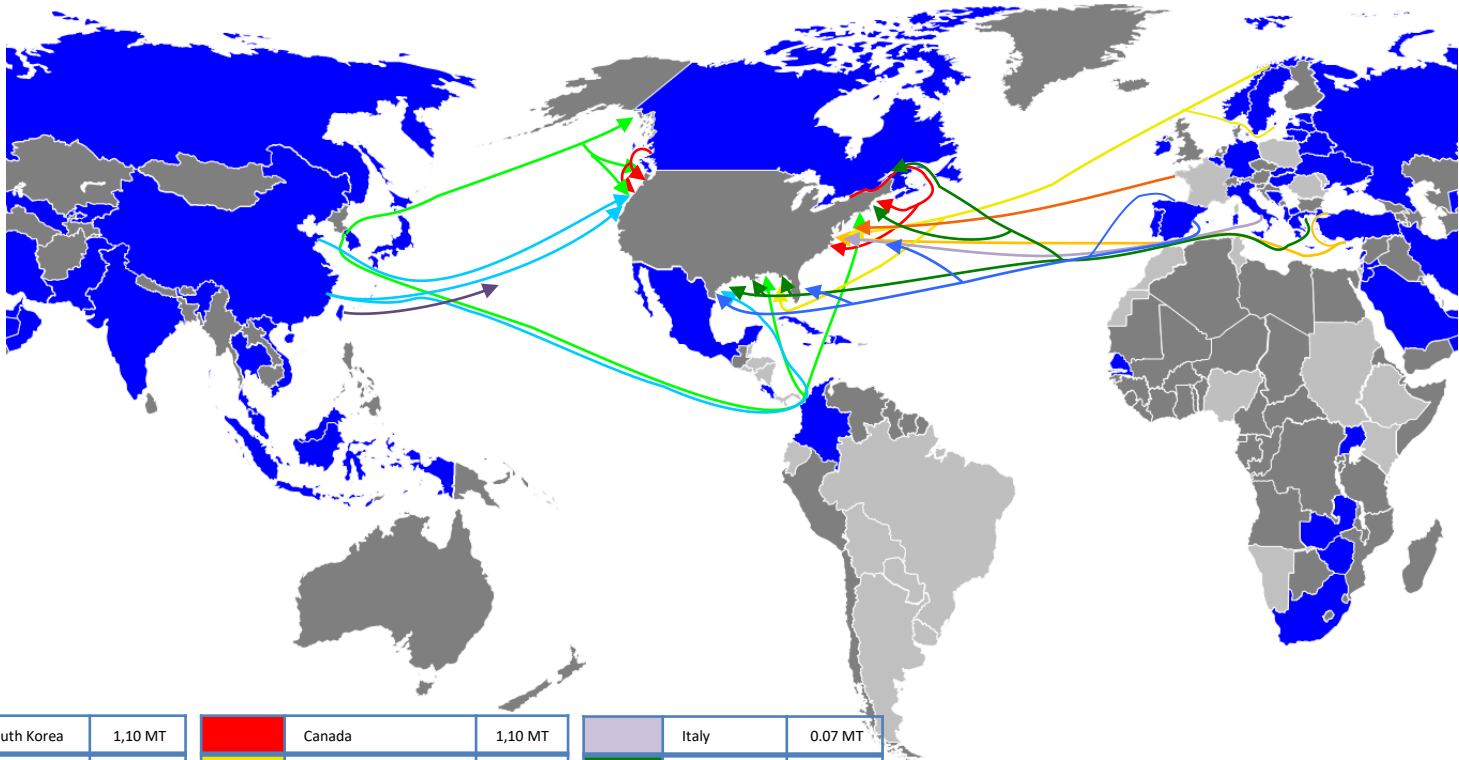
## North America

- 28 cement producing companies with 118 plants. 46 Import terminals with a ship unloader.
- The top five producers have 69 plants and 26 import terminals but in a very irregular way.
- 15 cement producers with 34 plants have no import terminal.
- There are six import terminals that have no connection to a US cement producer but these have very different backgrounds.

Note:     1) North America is US + Canada  
             2) McInnis is included

## North American seaborne trade flows 2015

Total US seaborne imports 7,75 MT



	South Korea	1,10 MT
	China	1.47 MT
	Taiwan	0.43 MT

	Canada	1,10 MT
	Scandinavian countries	0.68 MT
	France	0.08 MT
	Spain	0.37 MT

	Italy	0.07 MT
	Greece	1.66 MT
	Turkey	0.38 MT

Total Asia 3,00 MT

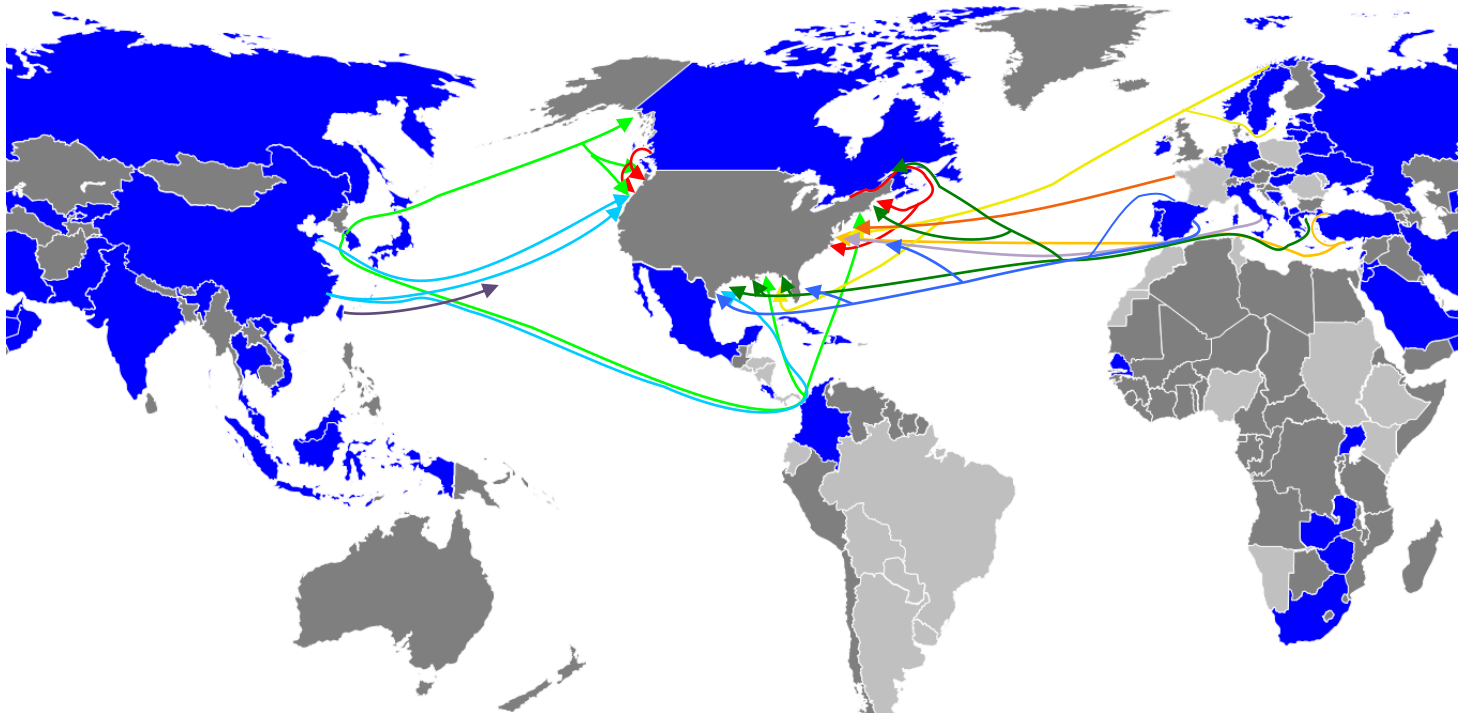
Total Canada 1,10 MT

Total Europe 3,24

Total small volumes 0,23 MT  
(inc. South America.)

# North American seaborne trade flows 2016 H1

Total US seaborne imports 4.41 MT



	South Korea	260.650
	China	764.134
	Taiwan	195.000

Total Asia 1.22 MT

	Canada	500.615
	Scandinavian countries	257.006
	France	53.861
	Spain	427.040
	Portugal	33.704

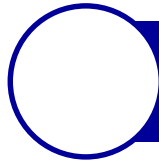
Total Canada 0.50 MT

	Italy	71.588
	Greece	1.083.519
	Turkey	556.466T
	Bulgaria	80.482

Total Europe 2.56

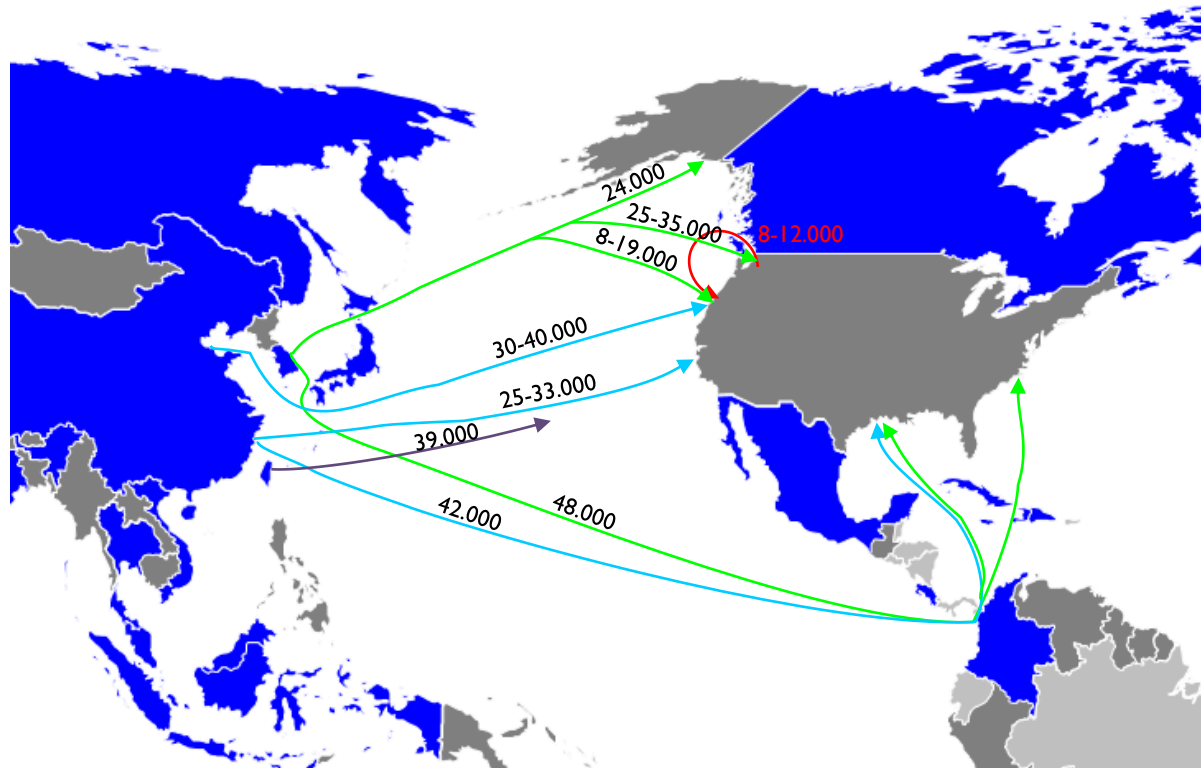
Total small volumes 0,13 MT  
(inc. South America.)





## Shipping (Pacific)

Typical cargo sizes

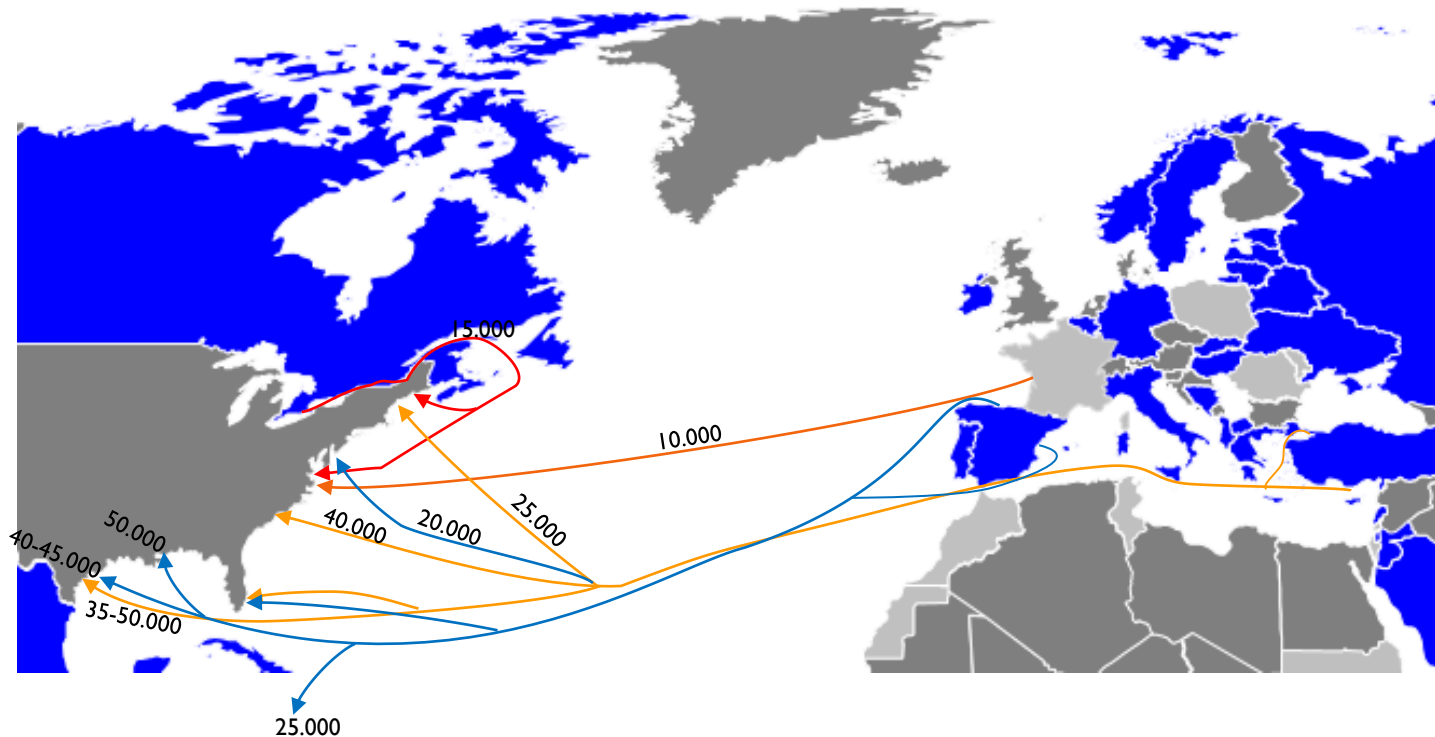


	South Korea
	China
	Taiwan
	Canada

All shipping on the Pacific side is by bulk carrier except from Canada which is by self-discharging barges.

## Shipping (Atlantic)

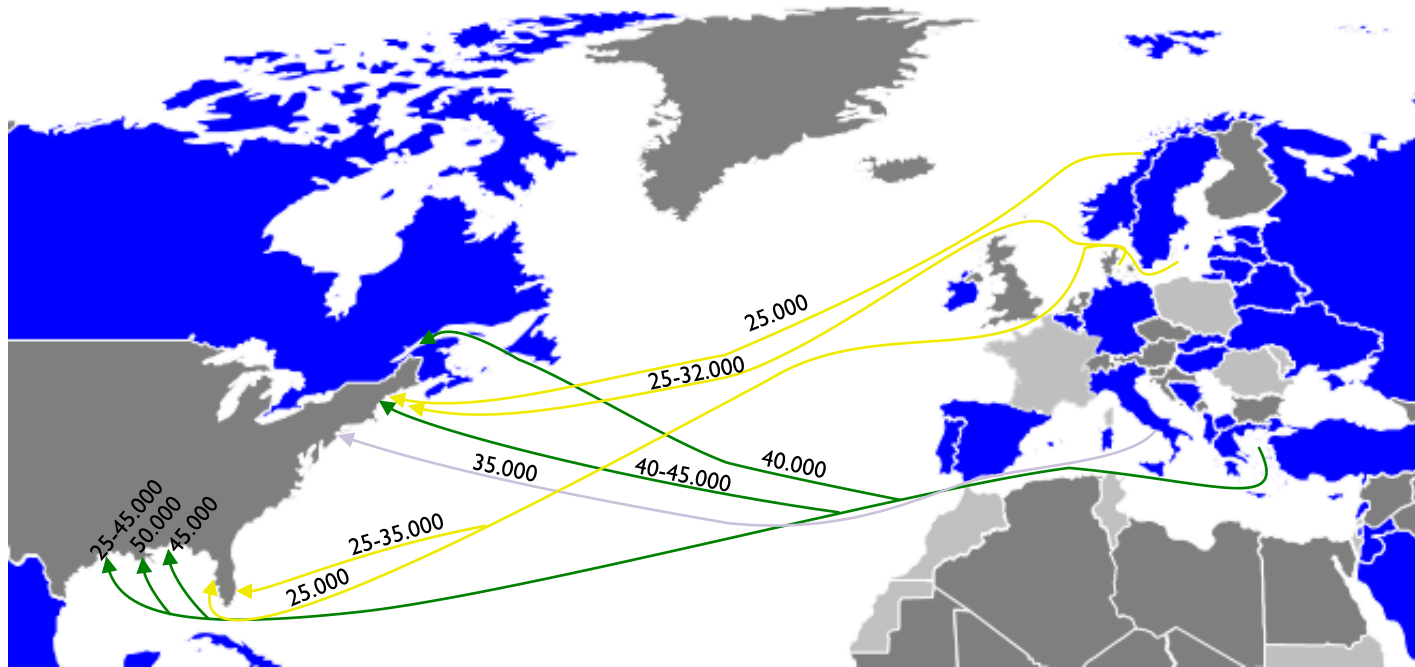
Typical cargo sizes



All shipping on the Atlantic side is by bulk carrier except from Canada which is by self-discharging barges and a few shipments from South America by self-discharging vessels.

## Shipping (Atlantic)

Typical cargo sizes



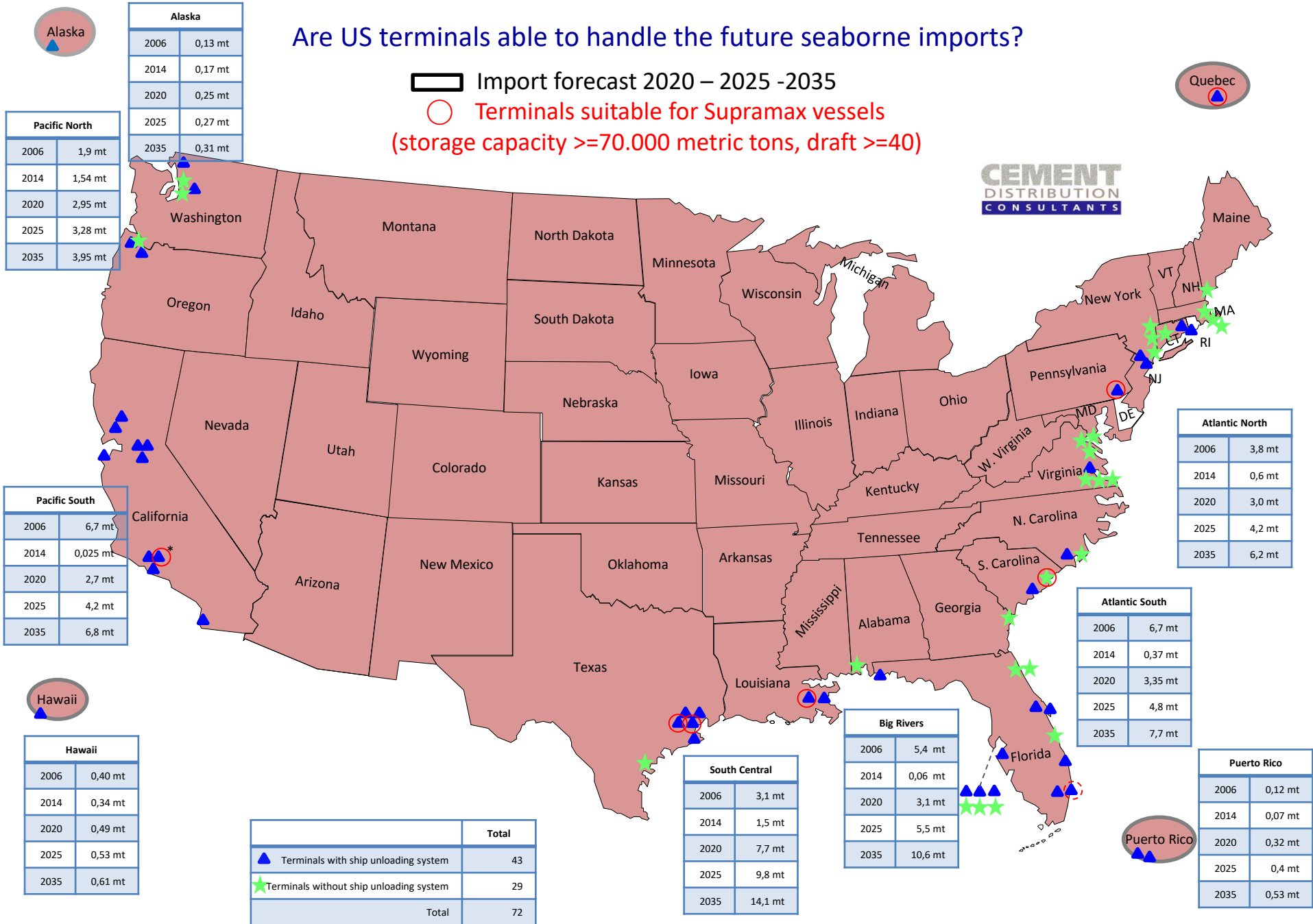
All shipping on the Atlantic side is by bulk carrier except from Canada which is by self-discharging barges and a few shipments from South America by self-discharging vessels.

# Are US terminals able to handle the future seaborne imports?

Import forecast 2020 – 2025 -2035

○ Terminals suitable for Supramax vessels  
(storage capacity  $\geq 70.000$  metric tons, draft  $\geq 40$ )

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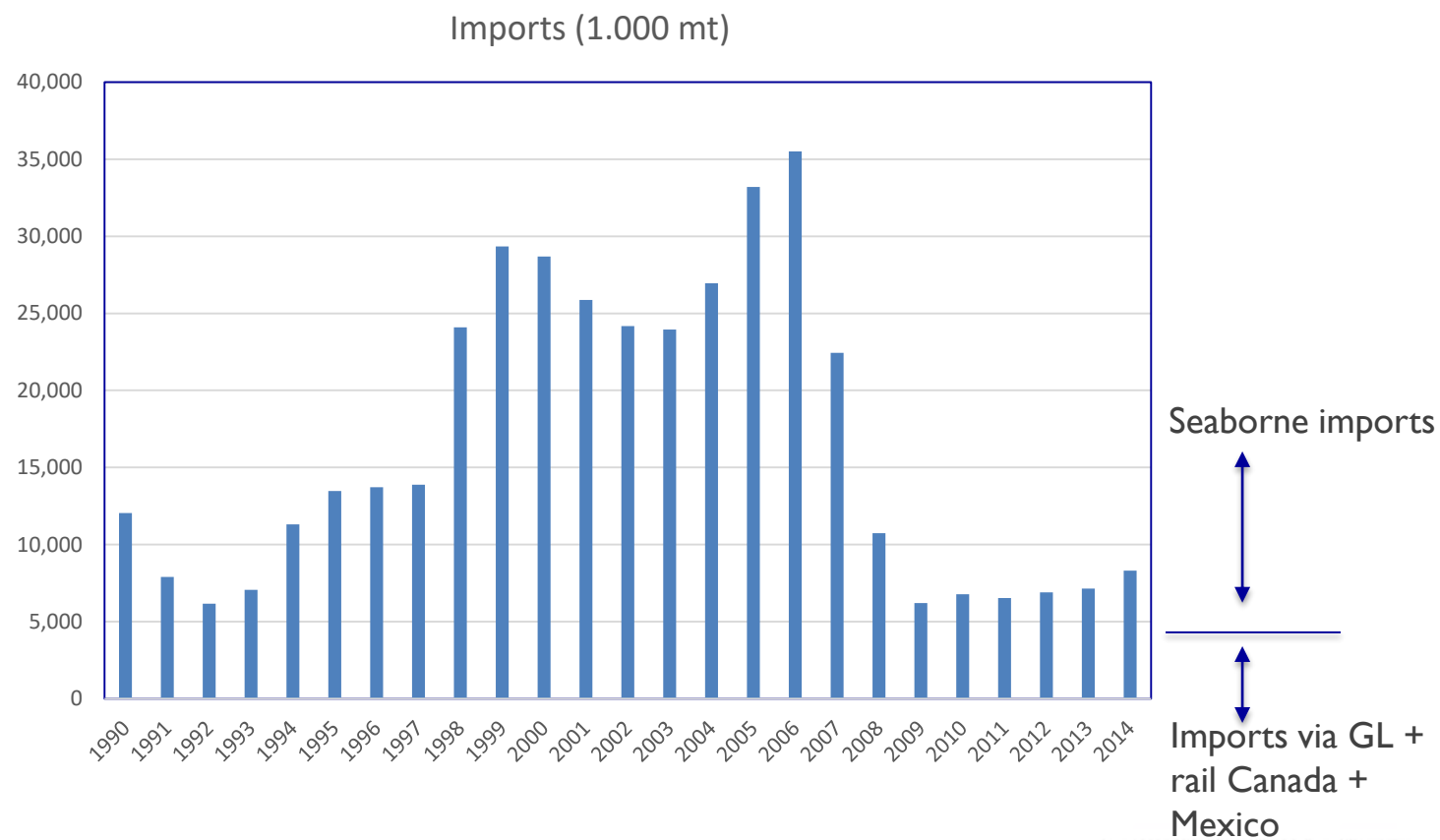
## North America

Storage size	Terminals with ship unloading system	Terminals without ship unloading system
< 45.000 mtons	7	24
45.000 – 70.000 mtons	30	4
≥ 70.000 mtons	7	0

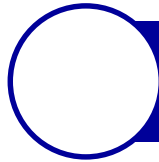


Storage capacity of US cement terminals

## North America



Source: Global Cement Report



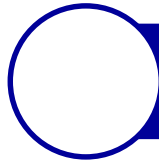
## North America

	Terminals with ship unloading system	Terminals receiving self discharging vessels
Before 1975	0	12
1975 – 1990	16	10
1991 – 1994 (downturn)	2	0
1995 – 2006	24	6
2007 – 2014 (crisis)	2	0

Of the 26 terminals with ship unloader built as from 1995 there are 22 built since 2000. These have been idle for a longer time than they have been in operation.

Even terminals of 30 years old have seen 10 years of almost zero seaborne imports.

## Age of US cement terminals



## North America

GGBFS flows to North California.

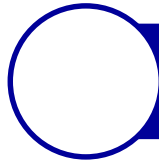
GBFS flow to grinding plants in New Orleans, Port Canaveral, Baltimore, Philadelphia (and across the Great Lakes).

Wet fly ash in 2015 Europe to Florida.

Dry fly ash in 2016 Europe to Northeast US / Canada.

The US is closing down coal fired power plants and will need to import substantial volumes of cementitious materials in the future. There are only two terminals in North America that have the capabilities to handle multiple materials in substantial volumes.





## North America

Given the large fluctuations of US cement imports over the years new terminal concepts need to be based on the following requirements.

### 1) Flexibility

- The cement terminal should be part of a multi product facility.
- The dock should be able to handle multiple materials (i.e. the cement unloading and conveying system should not block the dock). The cement storage facility should be in a location where it does not block other activities.
- The terminals should be expandable to handle bigger ships and multiple types of cement / cementitious materials (large storage facilities that can be subdivided).

### 2) Short Return On Investment

- Large but simple storage facilities (Flat storage or domes with floating fluidised floors (no piling)).
- Make optimal use of existing infrastructure.
- Simple, dock mobile, ship unloading and conveying systems.

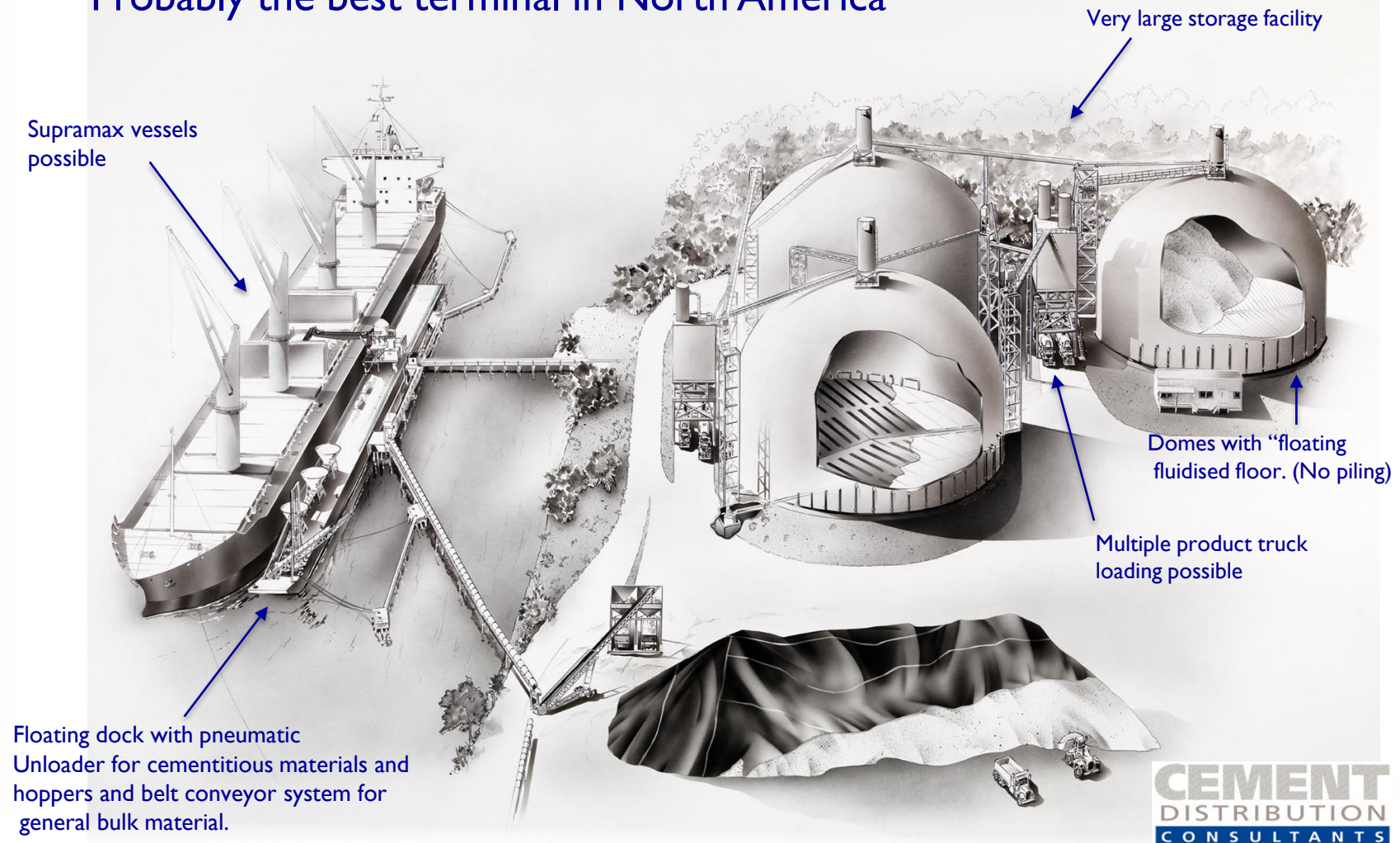
### 3) Short realisation time

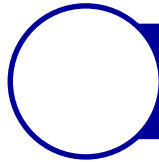
- If possible use brownfield sites with existing (partial) permits.
- If possible use existing storage facility.
- If possible start with grab & hopper discharge.

**What is the best cement terminal concept?**

## North America

Probably the best terminal in North America





## Closing remarks

Global seaborne trade in cement and clinker in 2016 reached approx. 117 mt. In addition another 94 mt was distributed by sea domestically.

Especially seaborne clinker trade increased reaching approx. 49 mt. Bulk cement seaborne trade grew to close to 52 mt and bagged cement shipments dropped slightly to 16 mt.

Seaborne domestic distribution in 2016 consisted of approx. 10 mt, clinker 73 mt and 11 mt of bagged cement.

Of all seaborne transport of cement and clinker in 2016 about 80 mt was transported by bulk carriers (Handysize and larger), 34 mt by coastal cargo vessels and about 97 mt by self-discharging cement carriers.

For 2017 the outlook for seaborne cement and clinker trade and distribution is again positive.



# The most comprehensive facilities database in the world!



**Extensive Database.** Since 1999 Cement Distribution Consultants has built a very large database on integrated cement plants, grinding plants, terminals (ship, barge, rail and truck), coal fired power plants and other fly ash related facilities, blast furnaces and other (G)GBFS related facilities and sources of natural pozzolans. All these facilities have been marked on Google Earth.

**Over 1400 facilities mapped.** Cement Distribution Consultants facility database has close to 1400 facilities involved in seaborne and waterborne trade and distribution of cement, clinker, (G)GBFS and fly ash. For each facility a datasheet is available with the key characteristics and includes the Google Earth place mark and photos.

**Nearby America US**  
**Houston Texas Terminal East**  
**Houston cement terminal**

**General description of facility**

Type of facility: Cement terminal

Market area: Larger Houston area

**Historical background:** The terminal was built in 2008 and has been the central with the largest cement throughput in the US for many years. The terminal handled around 1.8 million tons of cement in 2010. It is the largest cement ship unloader in the US.

**Location:**

Coordinates: 29°40'46.77"N

Coordinates: 95°13'54.07"W

Ownership: A&P Group

Address:  
15600 Houston  
TX 77059

Important release 2014: Together with the Houston west terminal these two terminals represent 1.8 million tons of cement. The Houston west terminal took about 800,000 tons and the Houston east terminal

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**Houston Texas Terminal East**  
**Houston cement terminal**

**Technical description of facility**

**Dock situation**

Type of Dock: Concrete dock on pile

Dock Depth: 12.2m

Max. Barge draft: 12.2m

Type of incoming ship: Bulk carrier

Type of discharge equipment: Mechanical unloader (x4)

Capacity: 1500 t/h

Coring system for storage: Sub conveyor bucket elevator system

**Storage facility**

Type: Silo

Capacity: 160,000 tons

Dimensions: 1 Silo of 15,000 tons plus new increases of 3,000 tons

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**Houston Texas Terminal East**  
**Houston cement terminal**

**Handling and distribution system**

Description: Bulk material is loaded directly under the silo (1 Level). A fourth truck loading system with a side unloader from the North side also will be installed soon.

**Other information**

**CEMENT DISTRIBUTION CONSULTANTS**



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# THANK YOU

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