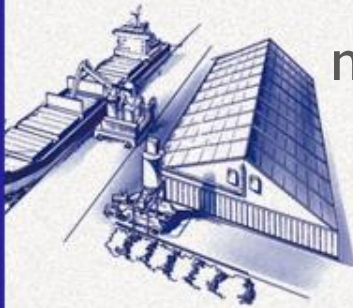


North American cement trade flows

-

A detailed overview of export sources shipping methods, import facilities and domestic distribution



Ad Ligthart

INTERCEM Shipping Americas, Charleston 13 June 2016



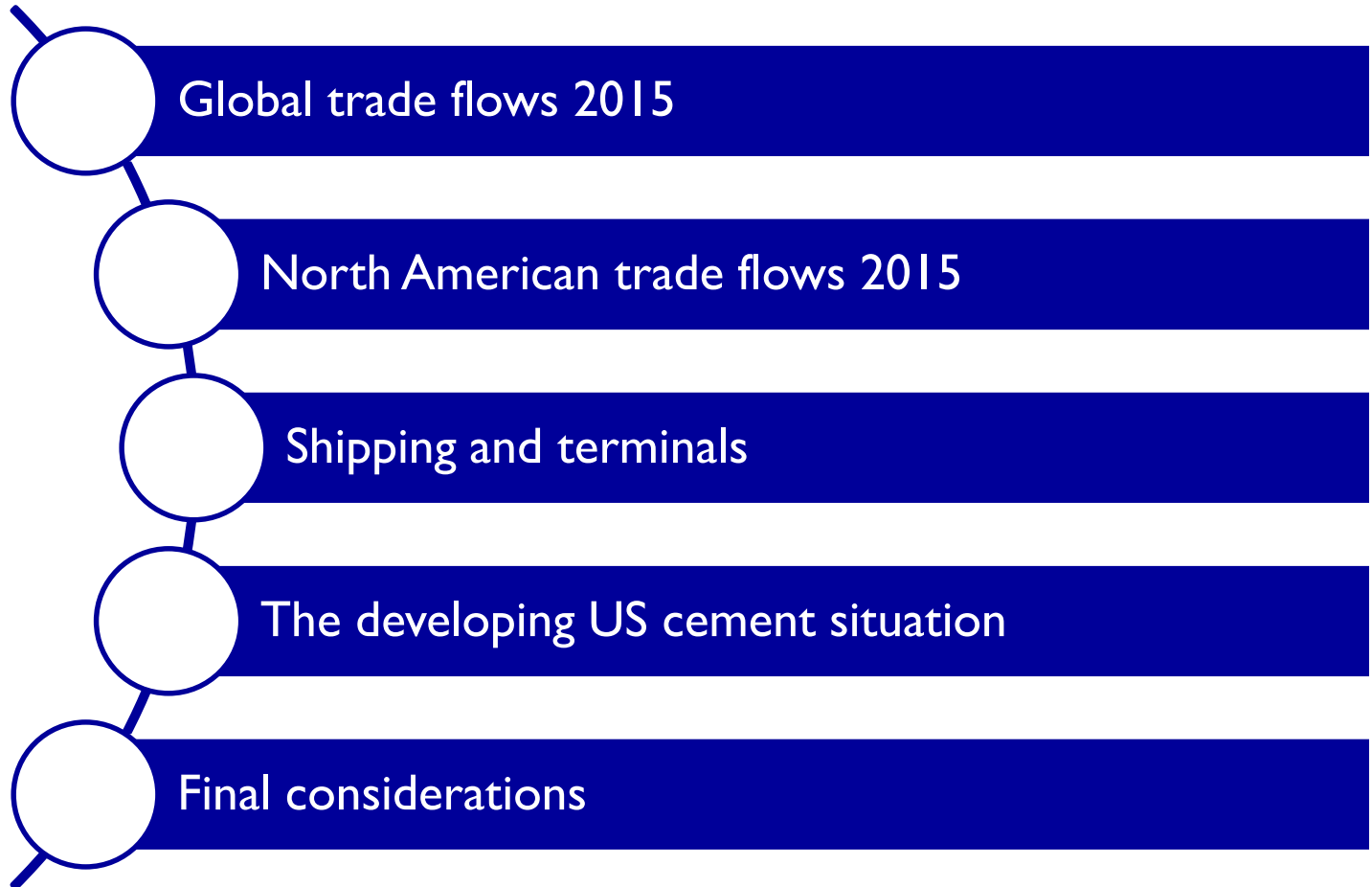
CEMENT
DISTRIBUTION
CONSULTANTS

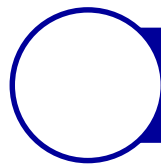
Cement Distribution Consultants an introduction

Market knowledge	Consulting	Project / interim management
<ul style="list-style-type: none"> The global cement industry on Google Earth Large database on waterside cement plants, waterside grinding plants and terminals Authors of the Handbook on Global Cement Trade and Distribution 30 Years experience 	<p>Logistical, economical and technical services</p> <ul style="list-style-type: none"> Feasibility studies of complete logistical chains for trade and distribution Shipping solutions Development of new facilities Terminal and equipment design 	<p>Realising and managing projects</p> <p>Examples</p> <ul style="list-style-type: none"> Redevelopment of large “brown field” bulk terminal Temporary cement and fly ash import project for construction of large concrete dam

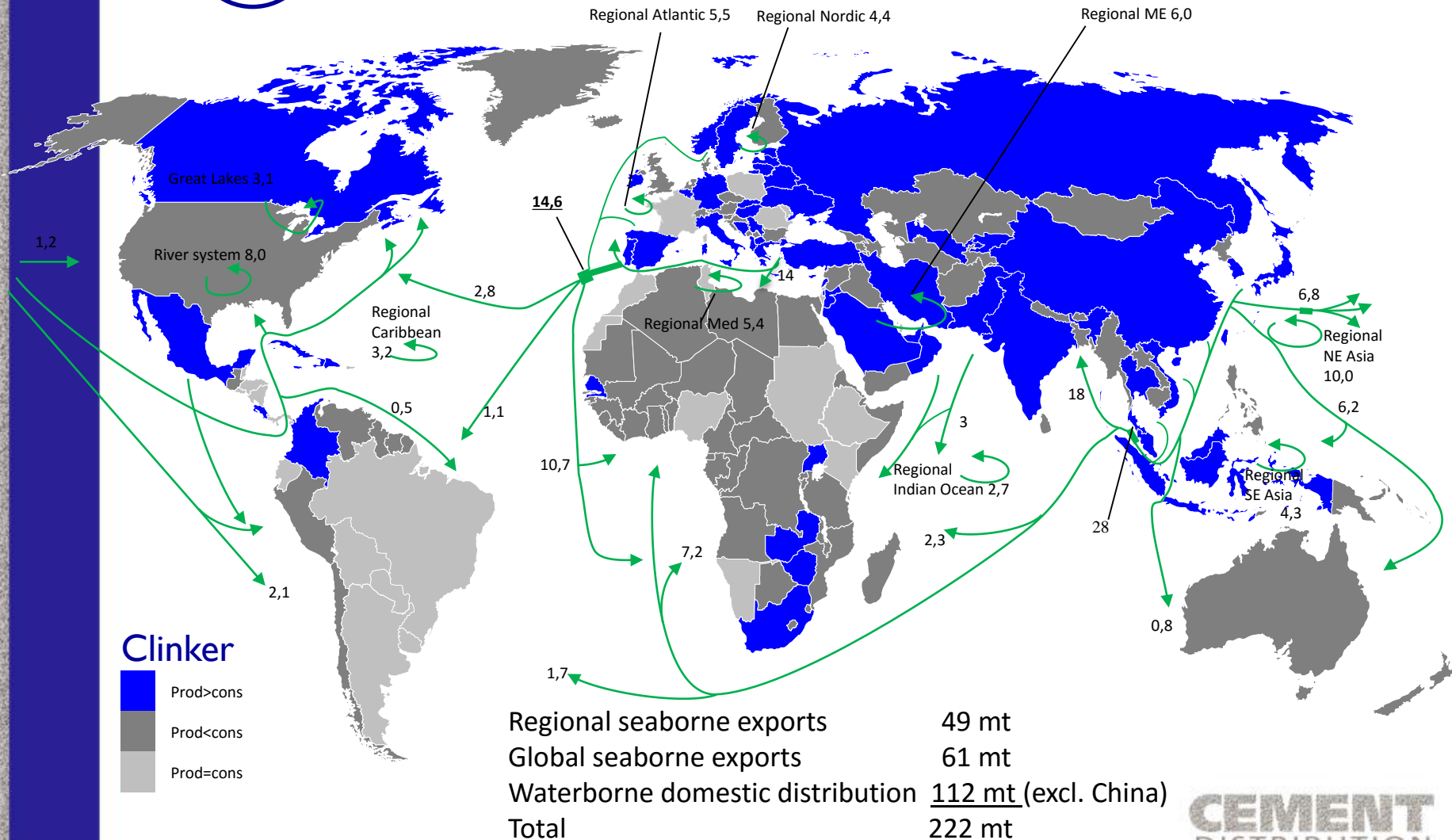


Contents of presentation

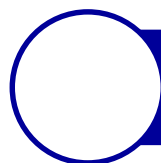




Global trade flows



2015 Global seaborne cement and clinker trade flows (est.)

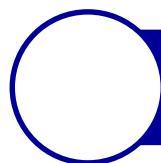


Global trade flows

CLINKER AND CEMENT TRADE BY WATER

Clinker / cement type	Seaborne trade (Mt)		Inland water domestic trade (Mt)
	International	Domestic	
Clinker	43.9	9,4	4,7
Cement – Bulk	49,1	72,1	10.3
Cement – Bagged	17,0	11,5	3,7
Total	110,0	93,0	18.7

Shipments by cargo type

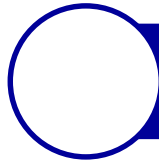


Global trade flows

CLINKER AND CEMENT TRADE BY VESSEL TYPE

Clinker / cement type	Bulk Carriers (Mt)		Self-disch. cement carriers (Mt)	Inland ships & water barges (Mt)*
	Large	Coastal		
Clinker	41,2	12,1	0	4,7
Cement – Bulk	12,7	11,5	97,0	10,3
Cement – Bagged	19,6	8,9	0	3,7
Total	73,5	32,5	97,0	18,7
* excluding China				

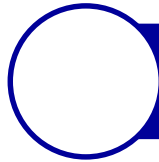
Clinker and cement trade by vessel type



Global trade flows

- Changing import markets
 - North African import markets are in decline.
 - Large production capacity increases throughout the developing nations. The need for bagged cement imports declines. Government protection against these imports.
 - However, a large part of the production capacity increases have been grinding plants increasing clinker imports.
 - Political instability and low oil prices have had a negative effect on economic growth in several oil and gas producing countries with a strong downward pressure on cement consumption.
 - US cement imports are growing significantly.

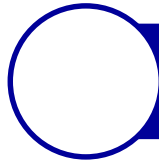
Developments in cement and clinker trade



Global trade flows

- A glut of exportable clinker and cement volumes has developed with a downward pressure on F.O.B prices
 - Economical downturn in China
 - Iran, Saudi Arabia, Indonesia (re) enter the market
 - Turkey, Vietnam, Pakistan keep adding capacity
 - Structural cement surpluses in South Europe, UAE, Thailand, etc.
- Shipping prices are remaining very low
- Trade in cementitious materials is growing and becomes more global

Developments in cement and clinker trade



Global trade flows

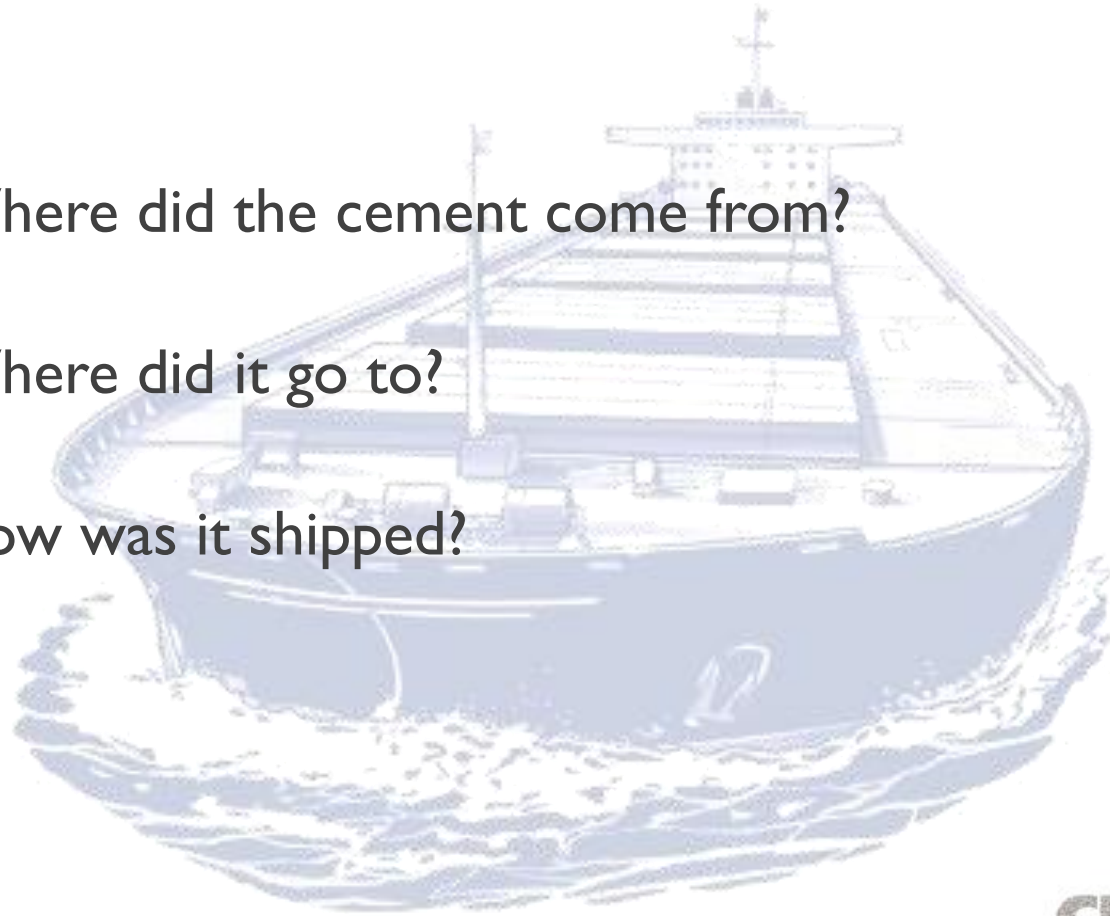
Result 1): Overall trade volume in 2016 will be about the same as 2015 but less bagged cement and more clinker and bulk cement trade.

Result 2): As the clinker and bulk cement import facilities are mostly in the hands of the cement industry and bagged cement imports can easily be stopped by anti-dumping suits and tariffs, uncontrolled imports will not occur in any sizable volume.

Result 3): The long-term export availability of low priced cement and (especially) clinker, in combination with low shipping prices makes it uneconomical to build integrated cement plants in coastal areas wherever in the world. It is more economical to import. New coastal cement production facilities will be grinding plants (with blending capability).

North American trade flows 2015

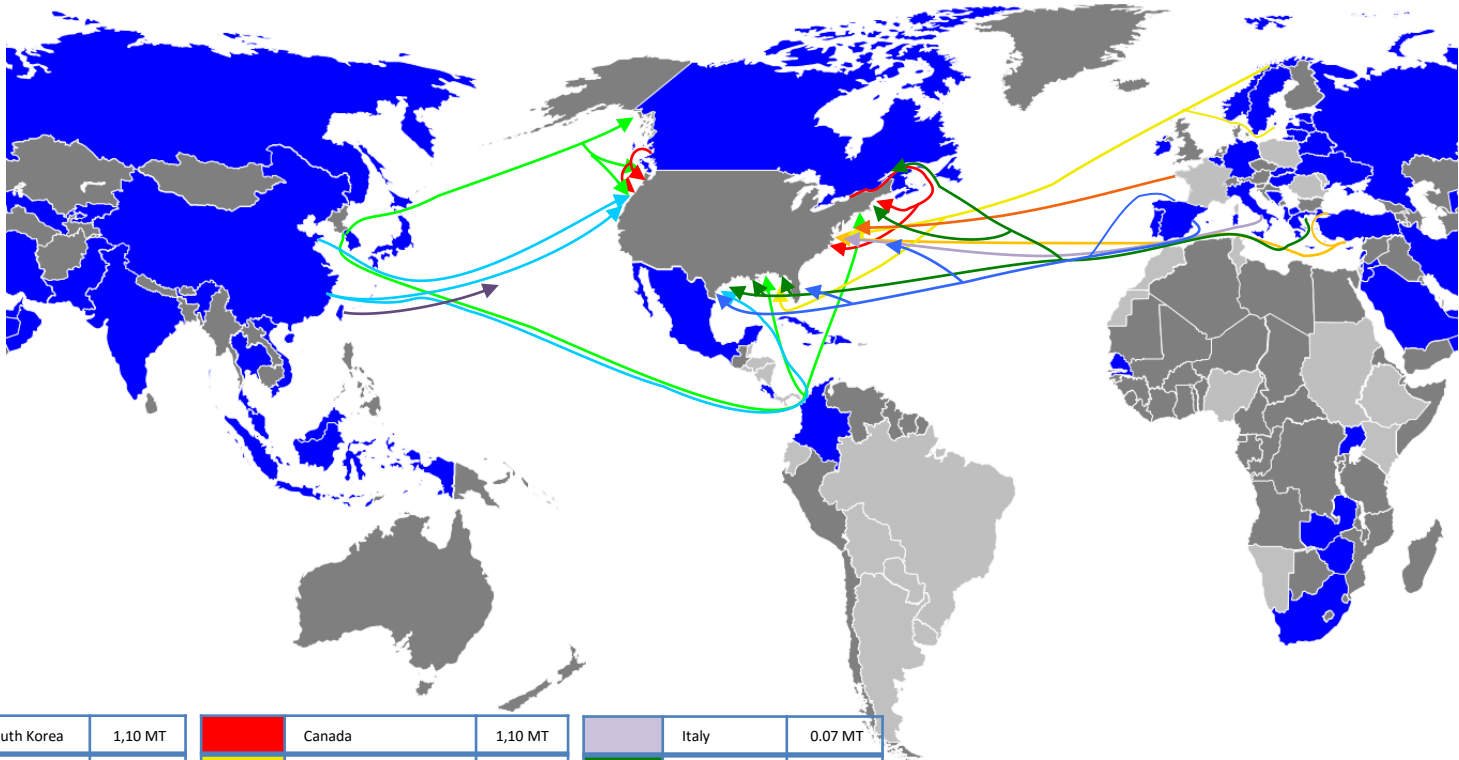
- Where did the cement come from?
- Where did it go to?
- How was it shipped?



Developments in cement and clinker trade

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

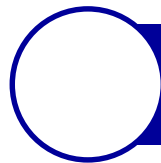
	Italy	0.07 MT
	Greece	1.66 MT
	Turkey	0.38 MT

Total Asia 3,00 MT

Total Canada 1,10 MT

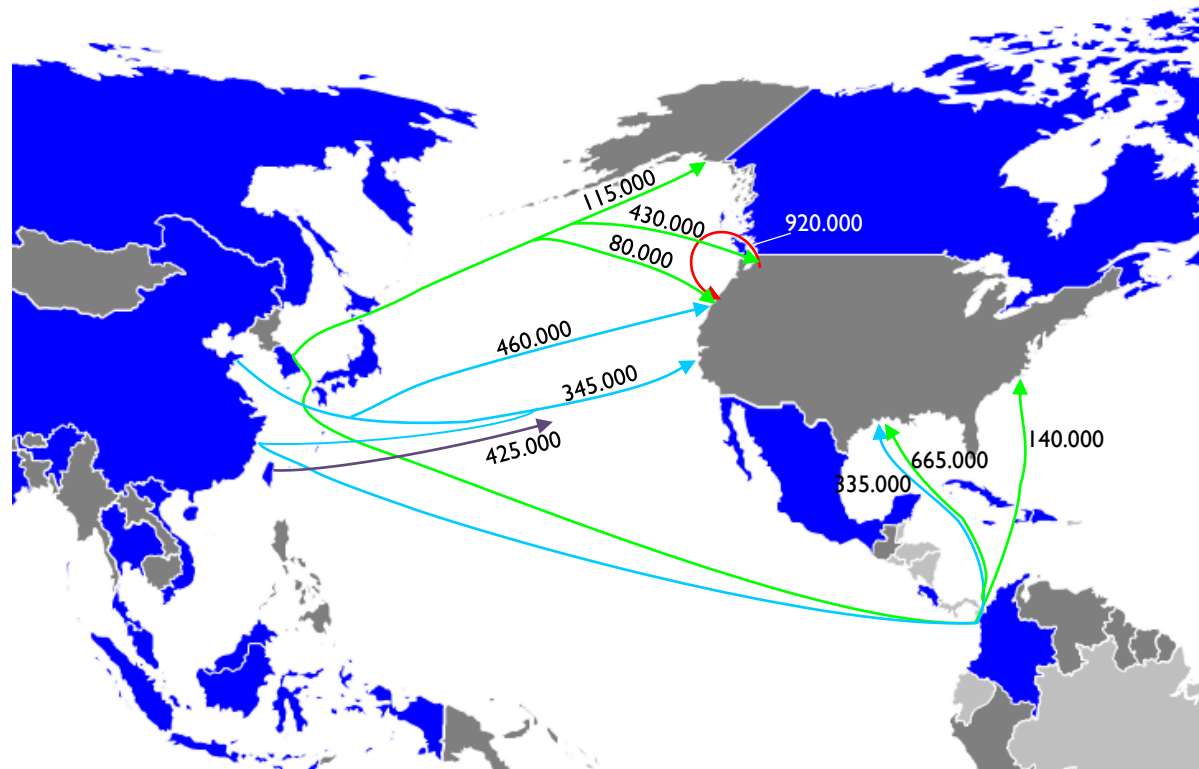
Total Europe 3,24

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



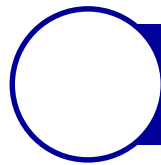
North American cement flows (Pacific)

Trading volumes 2015



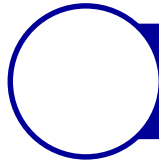
	South Korea
	China
	Taiwan
	Canada

Total Pacific flows 3.945.000 tons



Current exporters to North America (Pacific)

	Total seaborne exports 2015	of which to the US
China	16,2 MT	1.47 MT
South Korea	11,1 MT	1,10 MT
Taiwan	3,8 MT	0,43 MT
Total	31,1 MT	3,00 MT



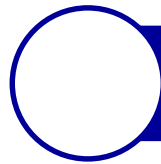
China

China cement industry in figures

Production 2014	2.480 million tons (cement)
Production 2015 (e)	2.320 million tons (cement)
Cement cons. per capita	1.694 kg (3 x global average)
Exports	16.2 million tons (0,65%)

China's theoretical available export capability in a down turn could be several hundred million tons

(Global seaborne trade in 2015 = 110 million tons)

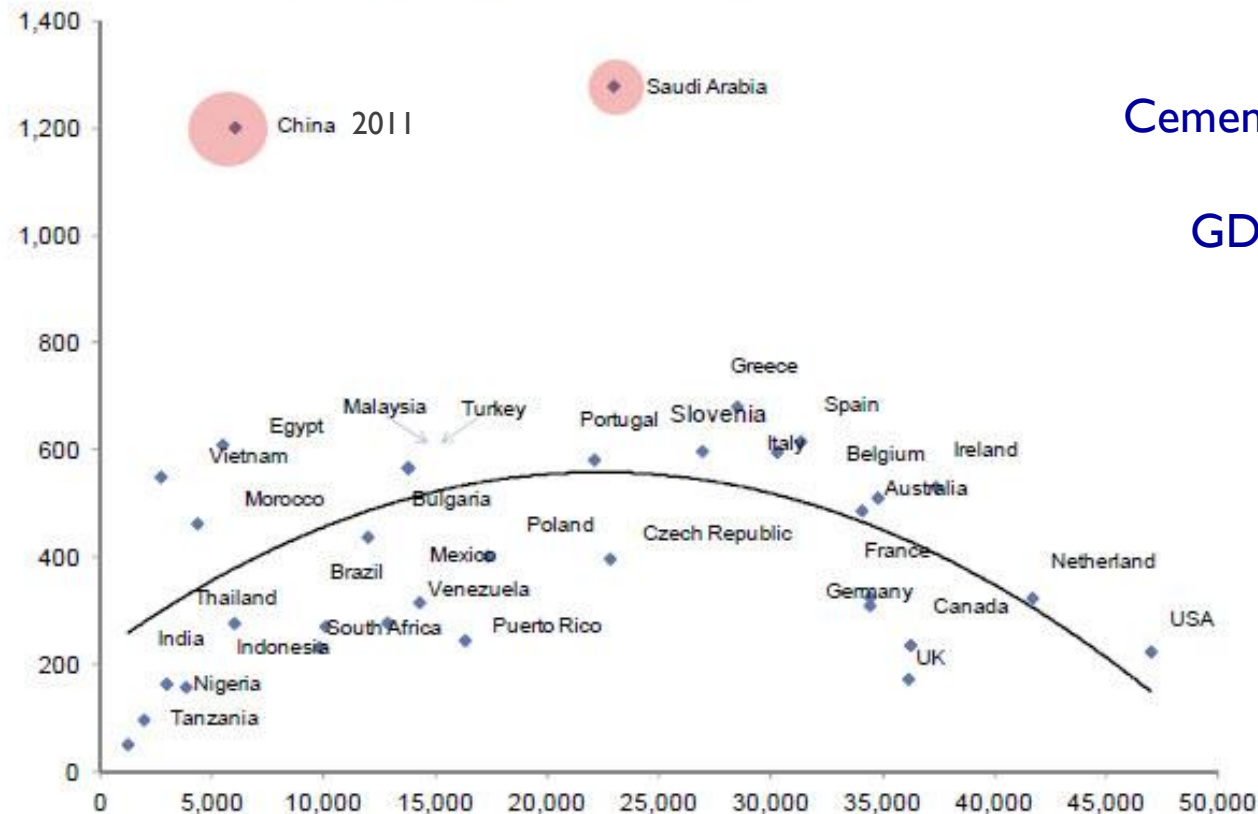


China developments

● China 2015 1.694 kg

The concrete scowl

Cement consumption per capita vs. GDP per capita

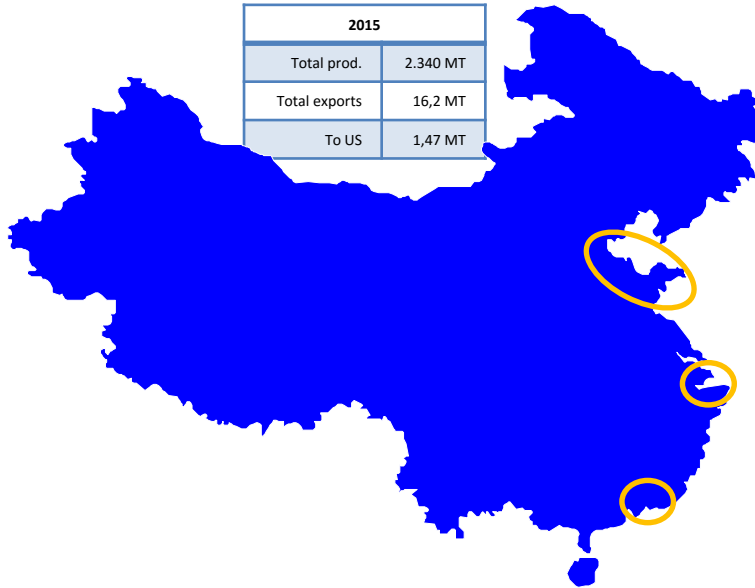


Cement consumption
vs
GDP per capita

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

The situation in China

2015	
Total prod.	2.340 MT
Total exports	16,2 MT
To US	1,47 MT



Exports have never been important for China and Chinese companies have not build up extensive international networks.

There will be heavy consolidation and international expansion in the coming years which creates an unstable situation.

China has very few cement plants on deep water. This means that most exports have to go via general ports which adds costs and limits the volume of bulk cement exports.



Key export areas

The situation in South Korea

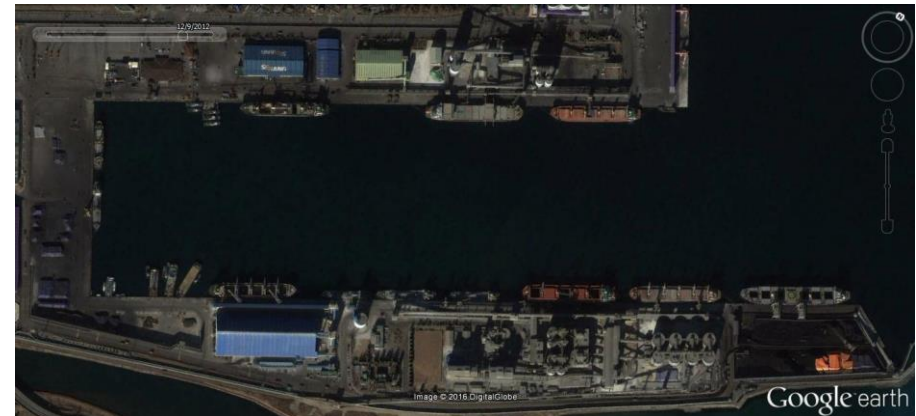
2015	
Total prod.	47,8 MT
Total exports	11,0 MT
To US	1,1 MT

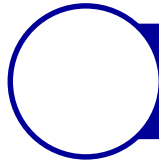


○ Key export areas



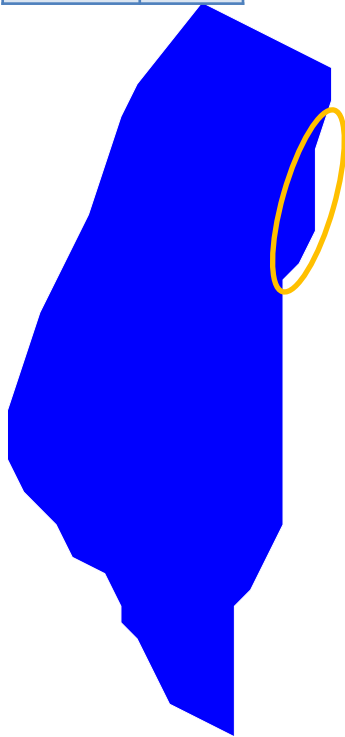
- Three cement plants have direct deep water access. (SsangYong, TongYang, Halla). SsangYong is most suited to load large vessels.





The situation in Taiwan

2015	
Total prod.	15,25 MT
Total exports	3,75 MT
To US	0,43 MT



Key export areas

- Two companies involved in exports (Taiwan Cement and Asia Cement).
- Government wants a reduction in exports (CO₂ production + energy imports).



The situation in Canada (Pacific)

2015	
Total prod.	11,9 MT
Seaborne exports	0,92 MT
Seaborne Atlantic	0,145 MT

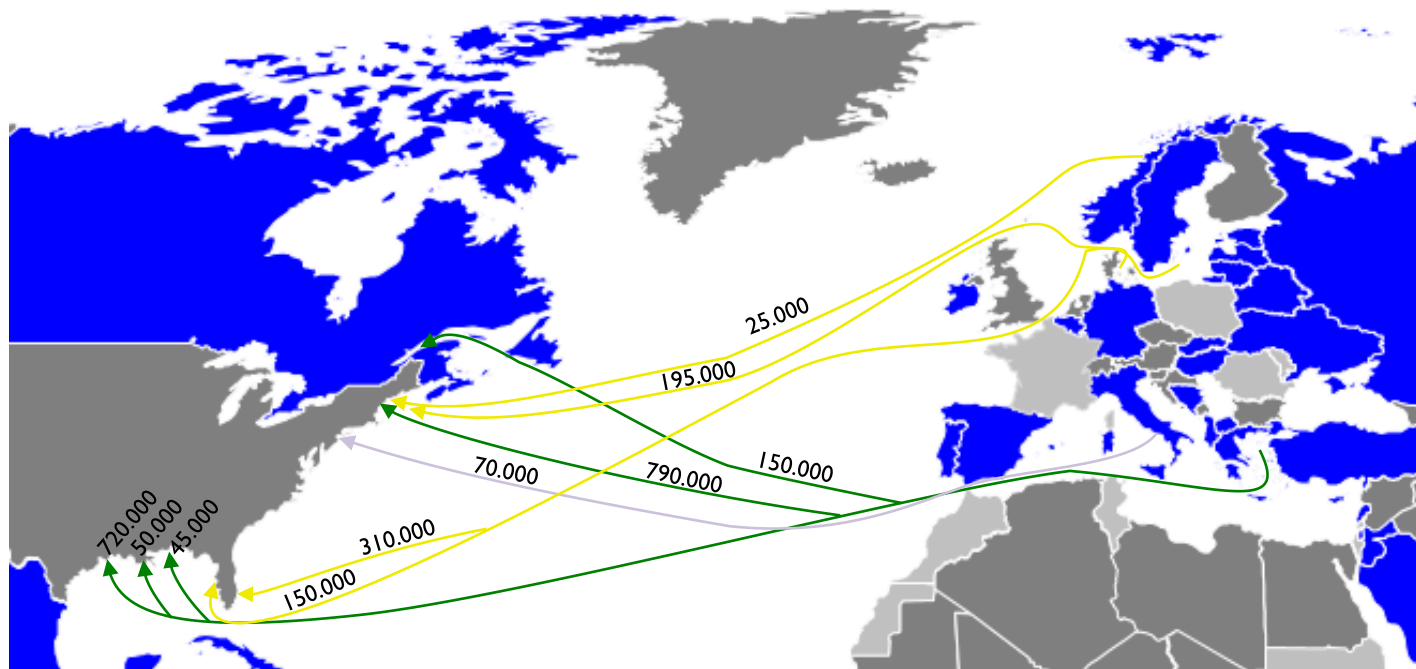


➤ Exports from Lafarge and Lehigh (Heidelberg) to their own terminals in the Seattle (WA) and Portland (OR) areas

○ Key export areas

North American cement flows (Atlantic)

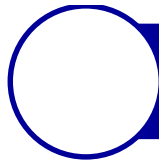
Trading volumes 2015



Scandinavian countries	0.68 MT
Greece	1.66 MT
Italy	0.07 MT

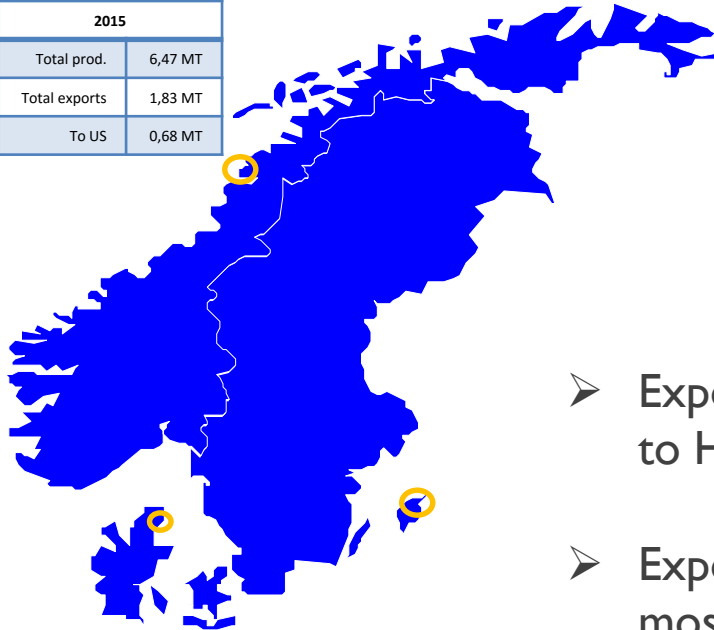
Current exporters to North America (Atlantic)

Canada	145.000 t
Scandinavian countries <ul style="list-style-type: none"> • Norway • Denmark • Sweden 	25.000 t 160.000 t (white) 495.000 t
Spain	370.000 t
Italy	65.000 t (clinker)
Greece	1.655.000 t
Turkey	375.000 t
Small volumes from Colombia, Mexico, Croatia and Jamaica	100.000 t
Egypt (white cement by containers)	80.000 t
Total Atlantic	3.371.000 t



The Scandinavian exporters

2015	
Total prod.	6,47 MT
Total exports	1,83 MT
To US	0,68 MT



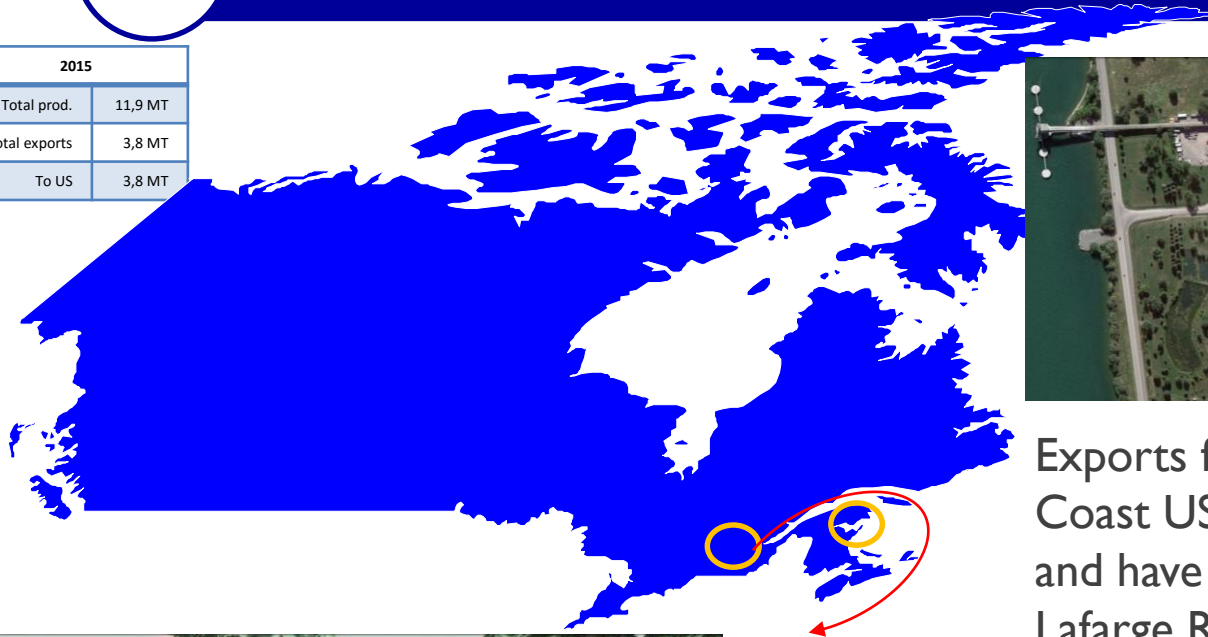
- Exports from Norway and Sweden by Heidelberg to Heidelberg terminals in the US.
- Exports from Denmark by Aalborg (Cementir) mostly to its own terminal in Tampa.



Key export areas

The situation in Canada (Atlantic)

2015	
Total prod.	11,9 MT
Total exports	3,8 MT
To US	3,8 MT



Exports from Canada to East Coast US have been by Lafarge and have been related to replace Lafarge Ravenna shipments.

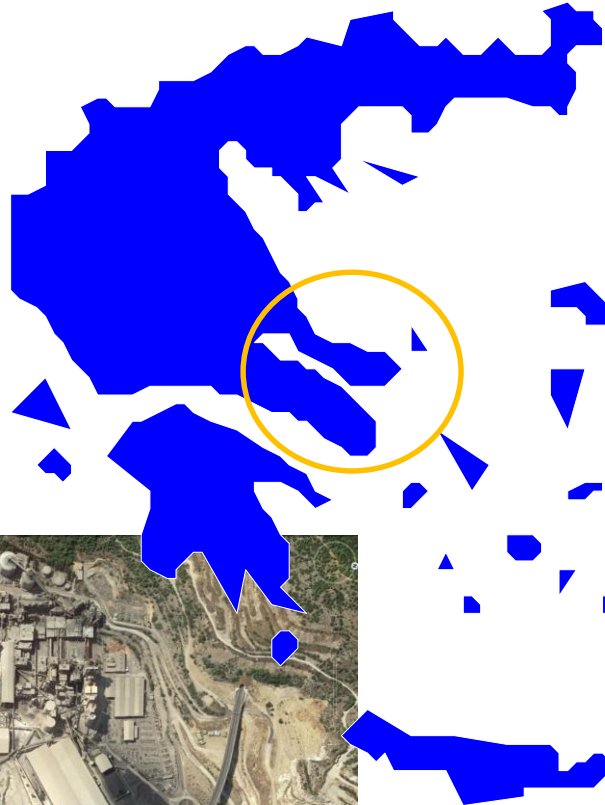


 Key export areas

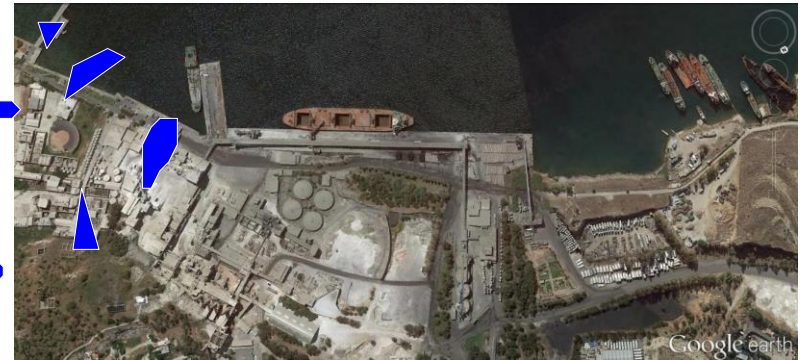
- The new McInnis plant will supply its own terminals in Providence and NYC as well as domestic terminal shipments.

The situation in Greece

2015	
Total prod.	5,45 MT
Total exports	2,47 MT
To US	1,65 MT



- Exports from Greece are by Titan and Lafarge.
- Titan shipped a large volume to its own terminal in NYC but also to others.
- Lafarge as yet has mainly shipped to others.



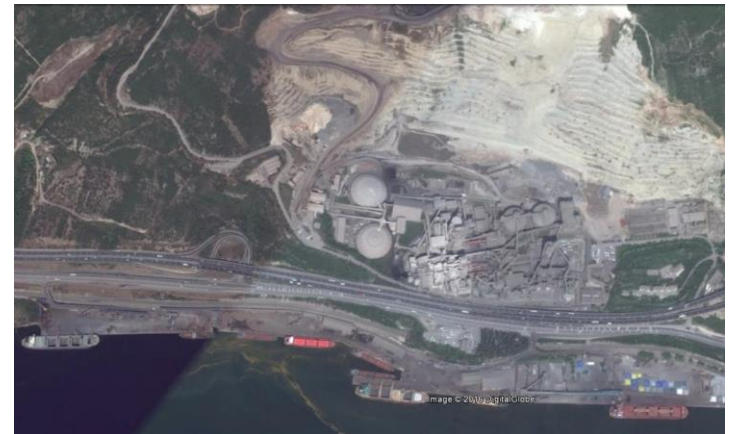
Key export areas

The situation in Turkey

2015	
Total prod.	79,3 MT
Total exports	11,9 MT
To US	0.38 MT



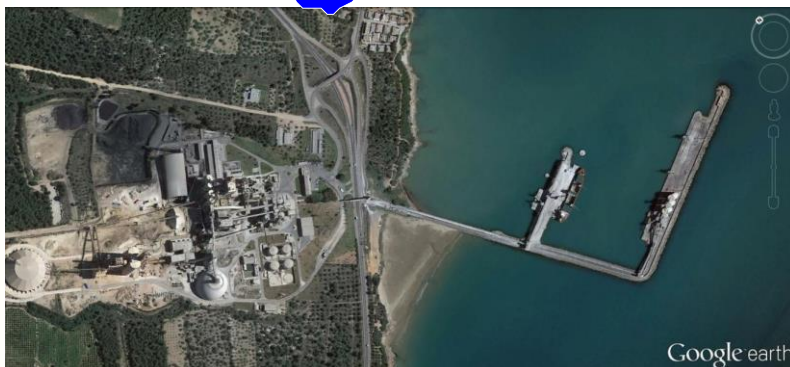
- Turkey has plants with direct deep-water access and several other plants that truck to the port and load directly into ships.
- As yet Turkey has still a lot of exportable volume left that could supply the US with the declining imports markets in North Africa.



○ Key export areas

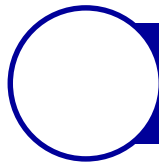
The situation in Spain

2015	
Total prod.	14,47 MT
Total exports	3,60 MT
To US	0,37 MT



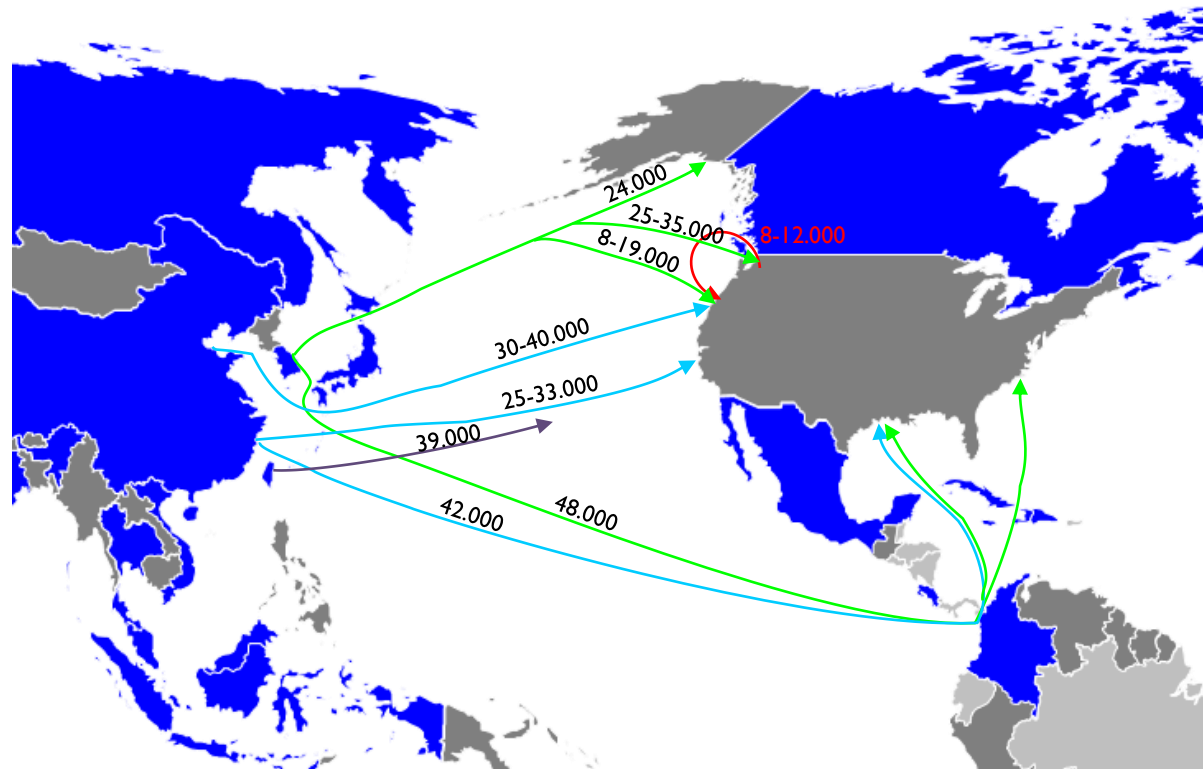
 Key export areas

- Spain has plants on the Atlantic and plants on the Mediterranean with direct deep water access. The Atlantic plants can load max. Handysize vessels.
- Spain still has sufficient exportable volume left to supply the US.



Shipping (Pacific)

Typical cargo sizes

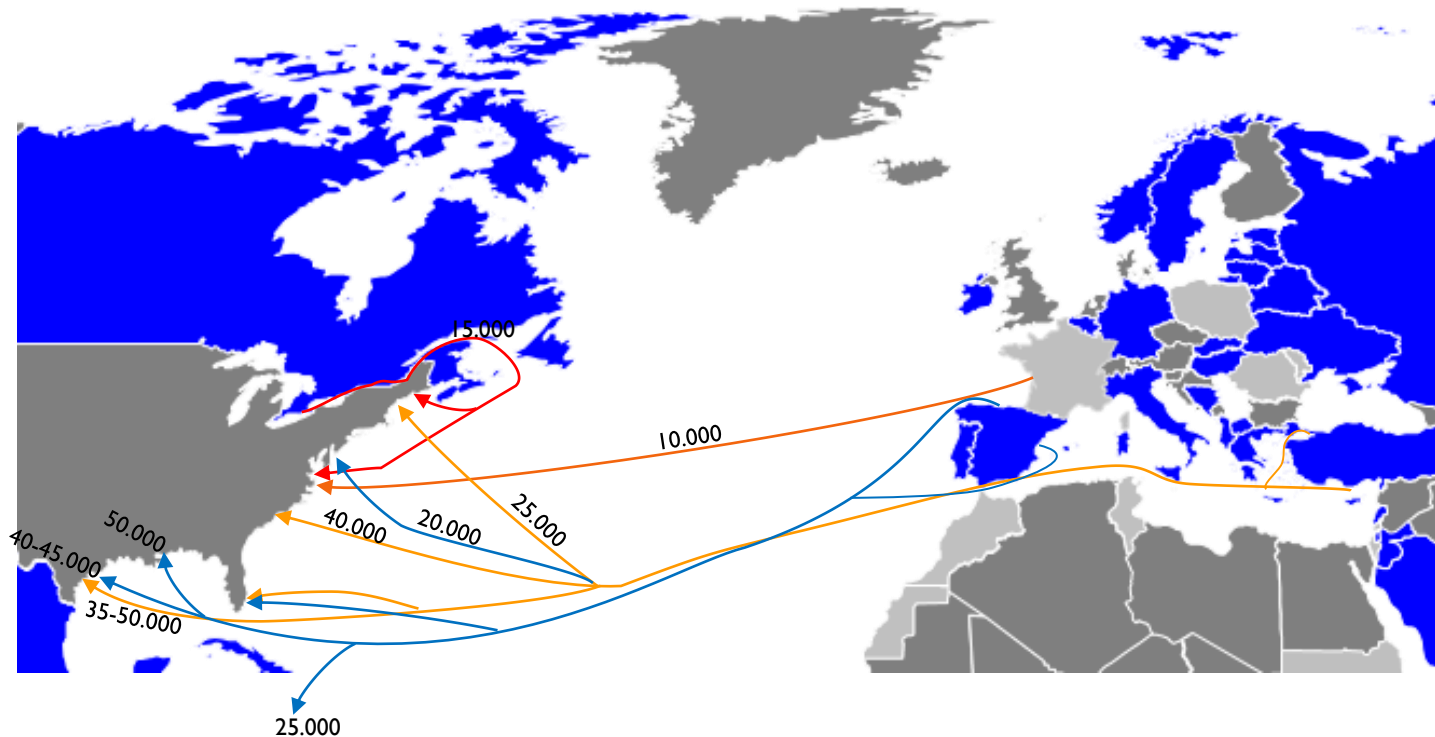


Green	South Korea
Blue	China
Purple	Taiwan
Red	Canada

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

Shipping (Atlantic)

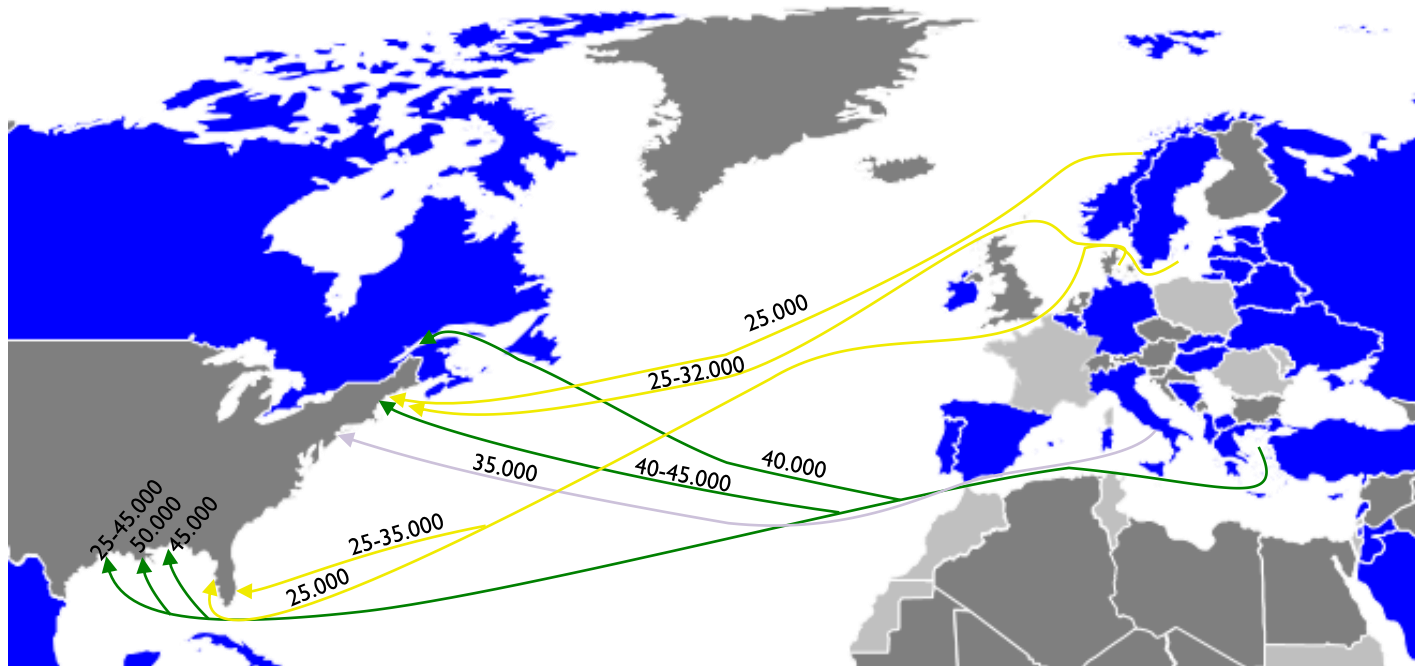
Cargo sizes 2015



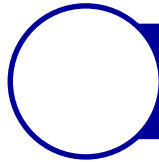
All shipping on the Atlantic side is by bulk carrier except from Canada which is by self-discharging barges and a few shipments from South America by self-discharging vessels.

Shipping (Atlantic)

Cargo sizes 2015



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.



Cementitious materials seaborne trade flows

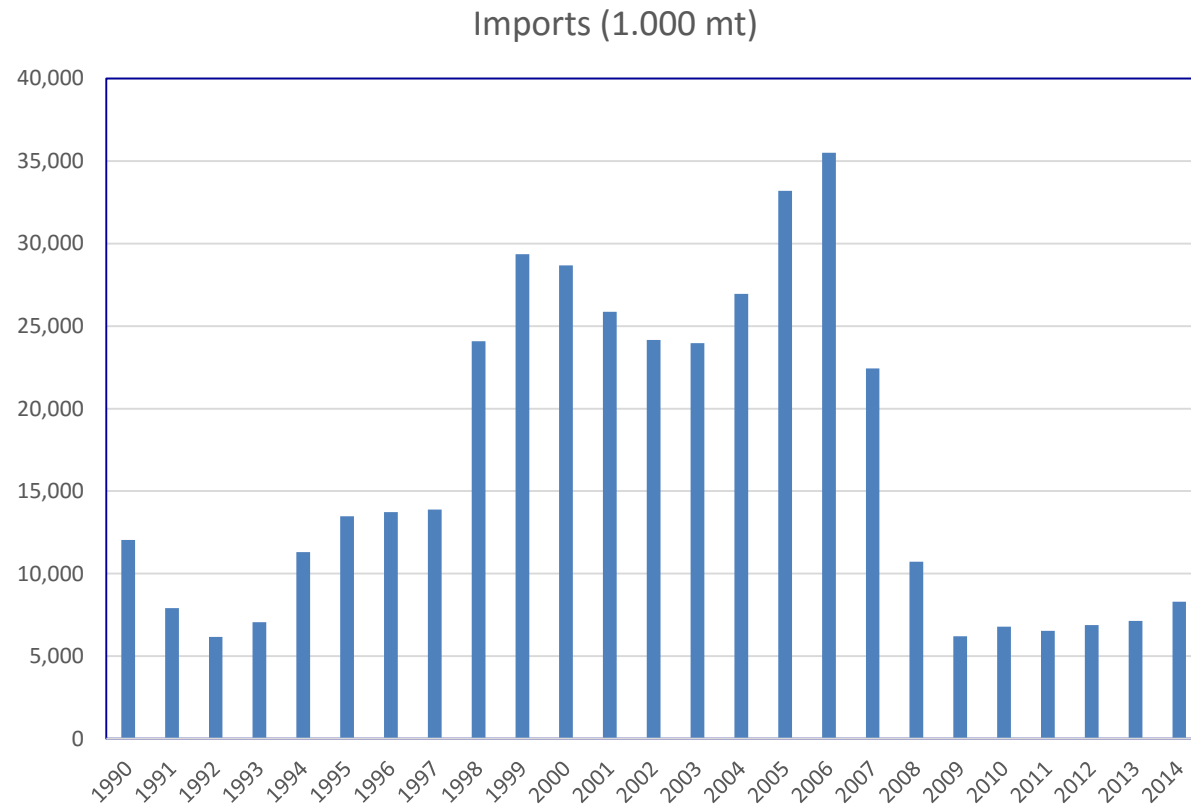
GGBFS flows to North California

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

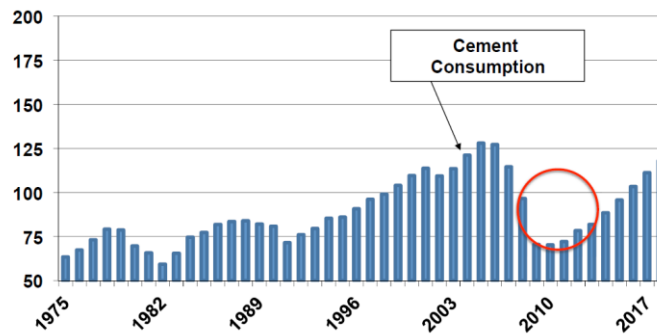
A bit of history of US cement imports



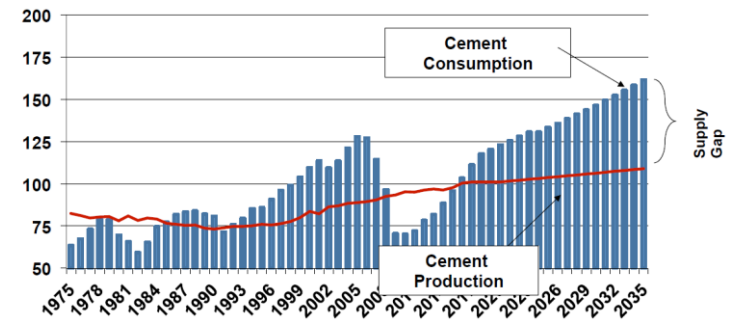
Source: Global Cement Report

...and a look into the future

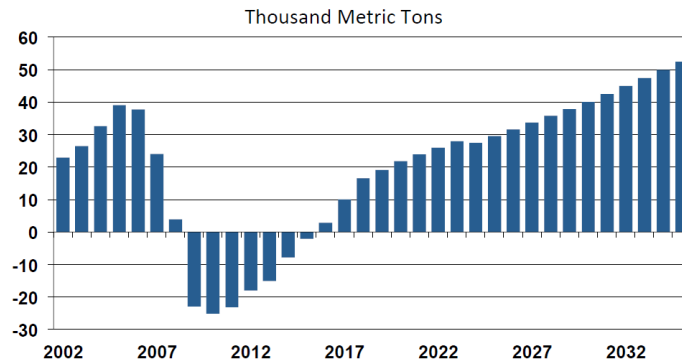
Cement Consumption
Million Metric Tons



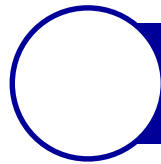
Projected Cement Consumption & Production
Metric Tons



Consumption in Excess of Long-Term Supply



Source: PCA, Ed Sullivan, Interem London 2015



A bit of history on US cement imports

	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

Notes:

1) For the terminals with a ship unloading system the delivery date of the ship unloader has been used.

2) 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.

50% Of all US large seaborne cement import terminals have been built since 2000 and have seen more years of crisis than years of profitable imports.

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

Age of US cement terminals

US cement terminals during the crisis

CEMENT
DISTRIBUTION
CONSULTANTS

Pacific North	
2006	2,1 mt
2010	1,0 mt
2014	1,7 mt

Quebec	
2006	2,1 mt
2010	1,0 mt
2014	1,7 mt

Pacific South	
2006	6,7 mt
2010	0,2 mt
2014	0,025mt

Atlantic North	
2006	3,8 mt
2010	0,4 mt
2014	0,6 mt

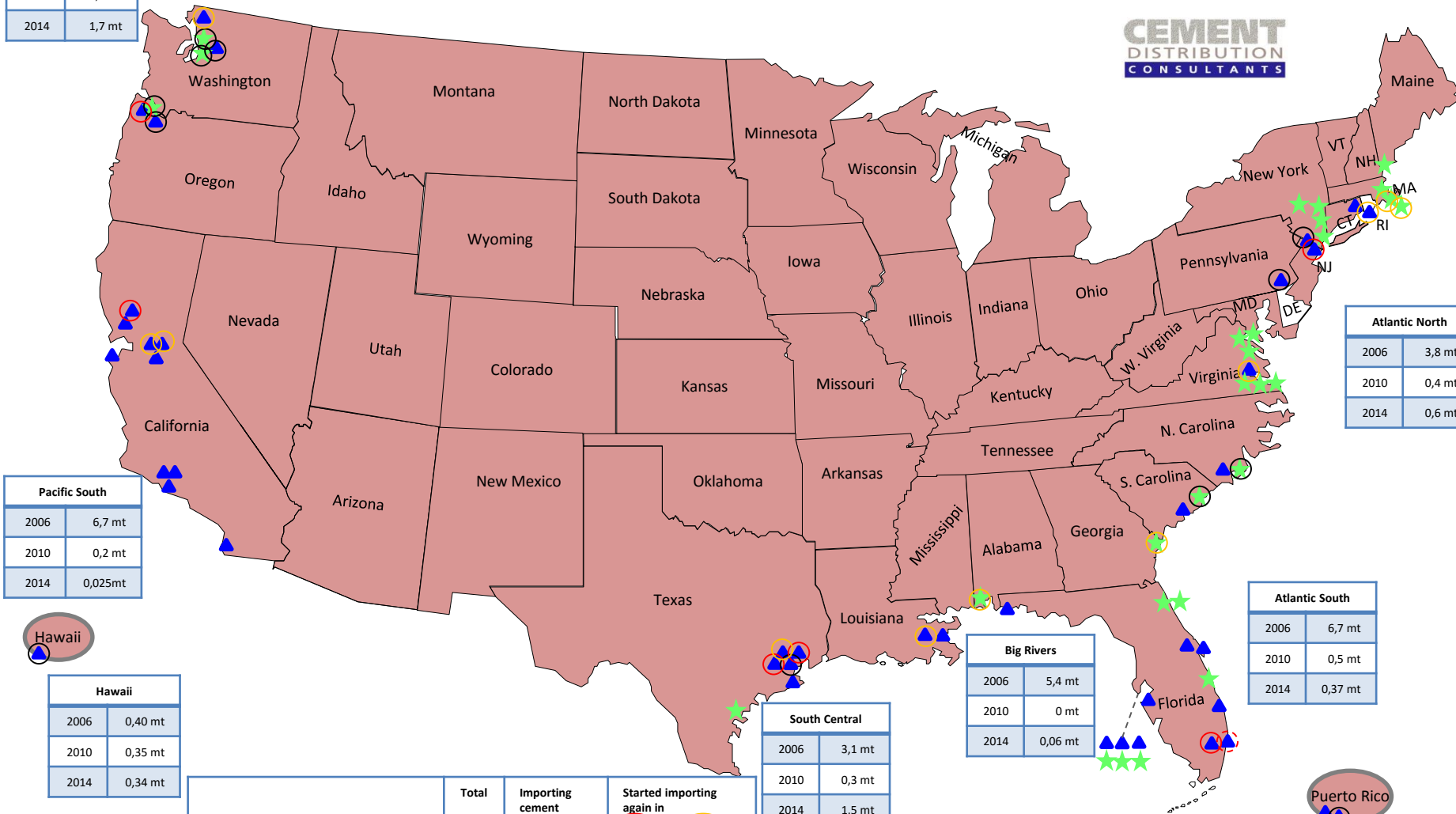
Hawaii	
2006	0,40 mt
2010	0,35 mt
2014	0,34 mt

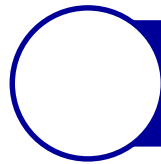
Atlantic South	
2006	6,7 mt
2010	0,5 mt
2014	0,37 mt

Big Rivers	
2006	5,4 mt
2010	0 mt
2014	0,06 mt

South Central	
2006	3,1 mt
2010	0,3 mt
2014	1,5 mt

	Total	Importing cement during crisis	Started importing again in 2014	Started importing again in 2015
▲ Terminals with ship unloading system	44	8	7	6
★ Terminals receiving self-discharging vessels	28	5	0	3
Total	72	13	7	9
All other terminals have been involved in domestic distribution or have been mothballed				





...and what is the current situation?

	Terminals with ship unloading system	Terminals receiving self discharging vessels	Total
US cement producer (multinational)	34	27	61
US cement producer (domestic owners)	5	1	5
“Independent” (not related to cement producers in the US)	6	0	6

Ownership situation of US terminals

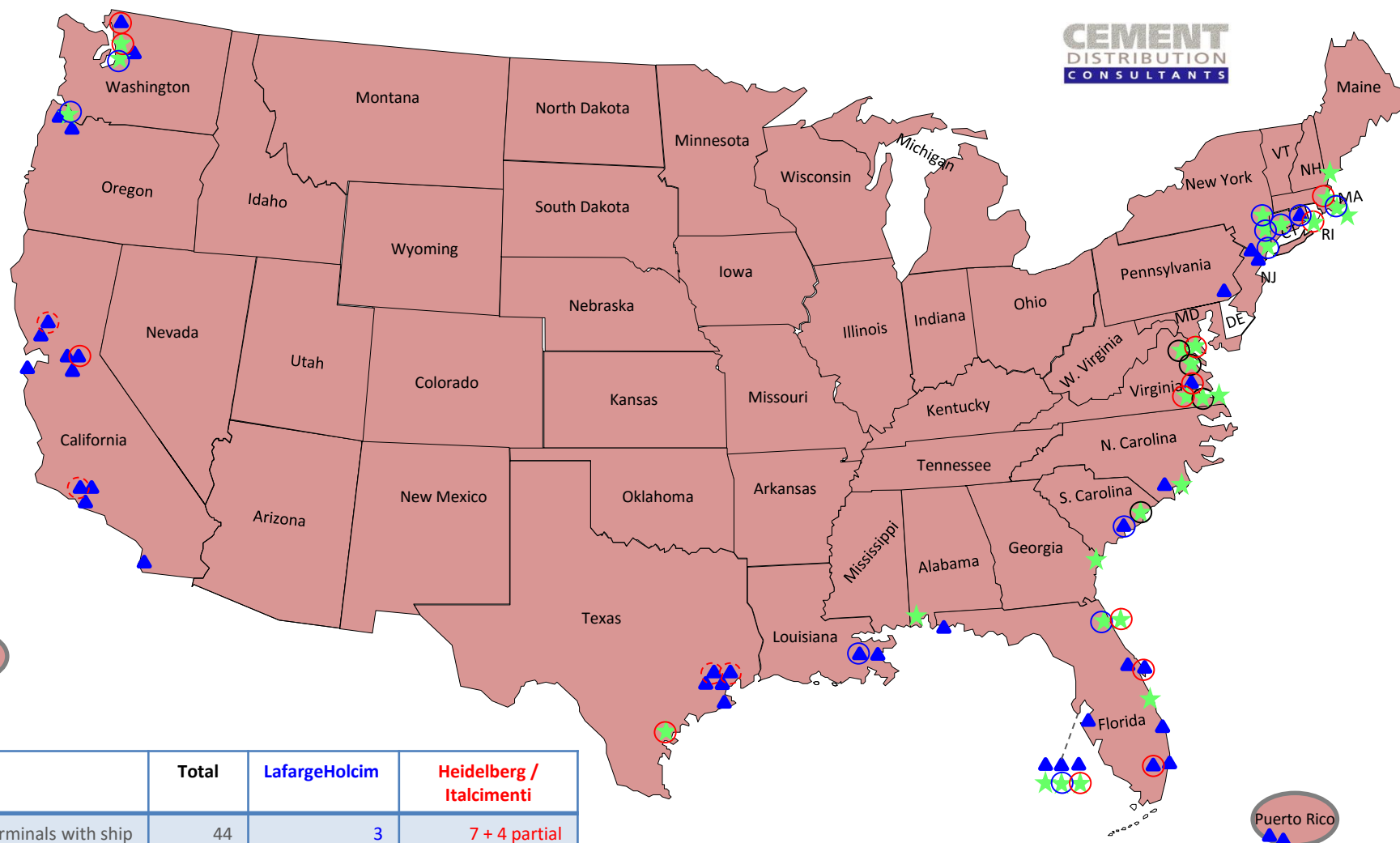


US terminals 2015

LafargeHolcim – Heidelberg / Italcementi ownership

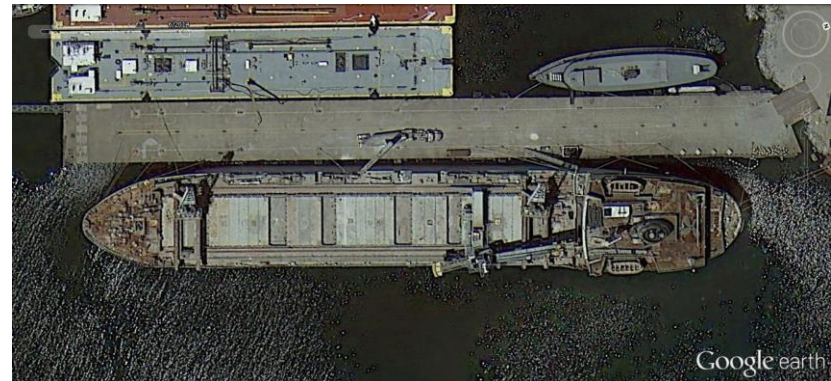
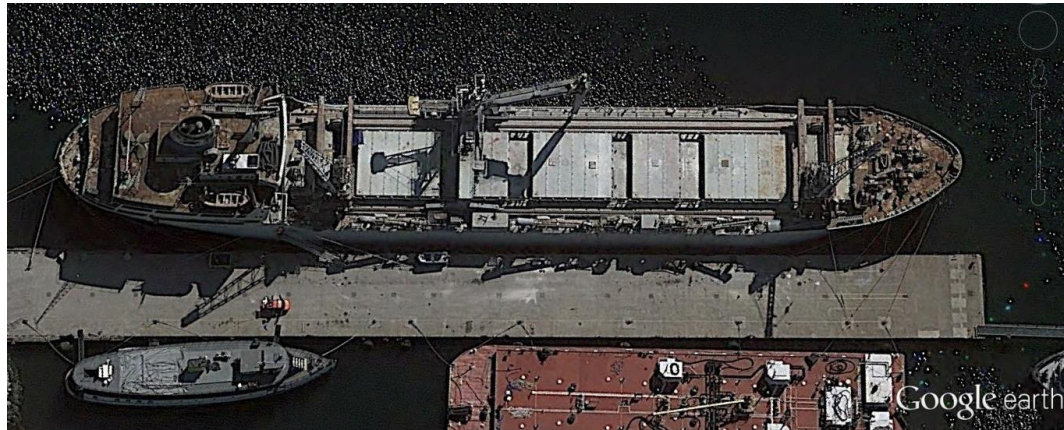


CEMENT
DISTRIBUTION
CONSULTANTS



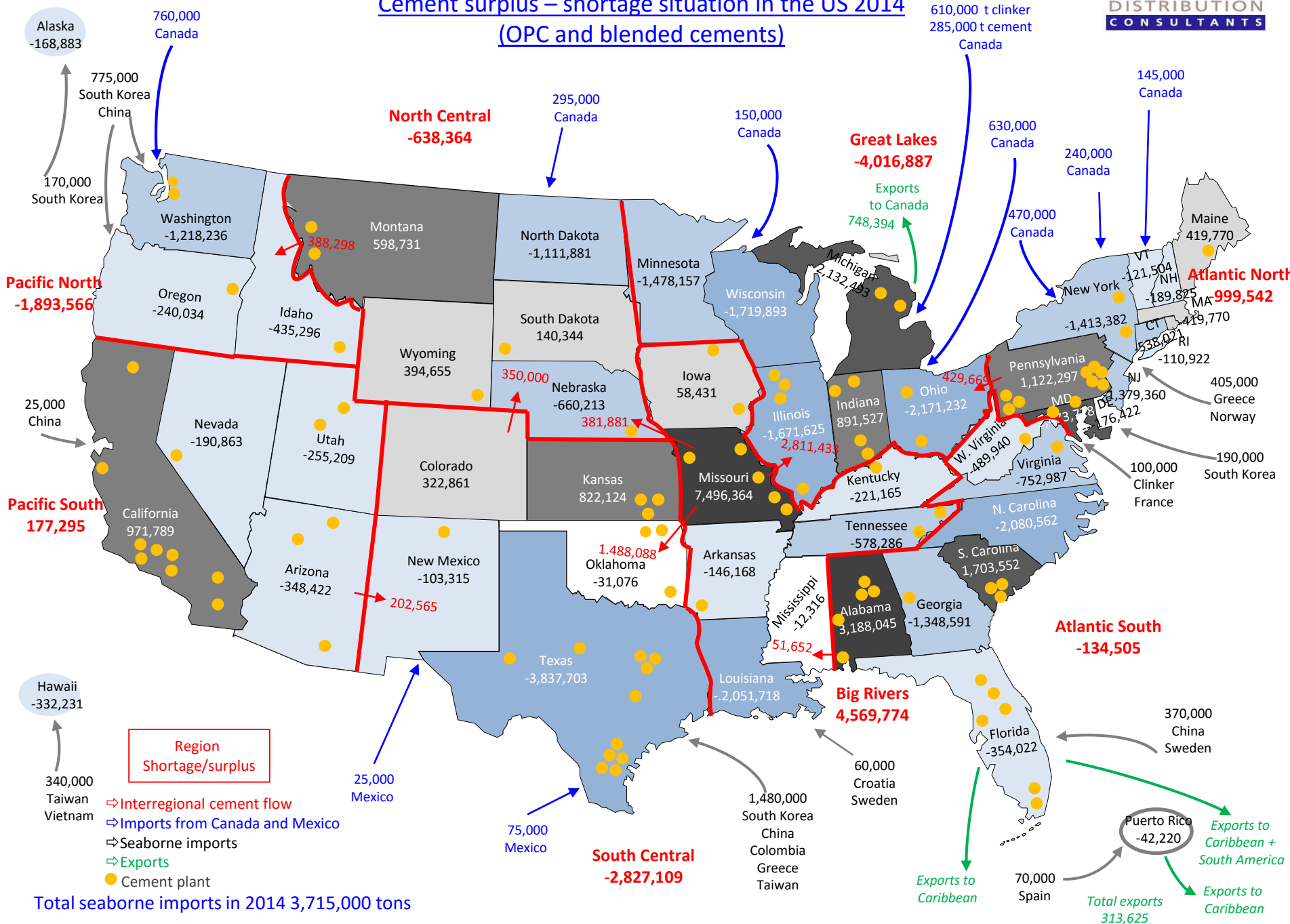
	Total	LafargeHolcim	Heidelberg / Italcementi
▲ Terminals with ship unloading system	44	3	7 + 4 partial
★ Terminals without ship unloading system	28	13	7
Total	72	16	14 + 4 partial

US terminals

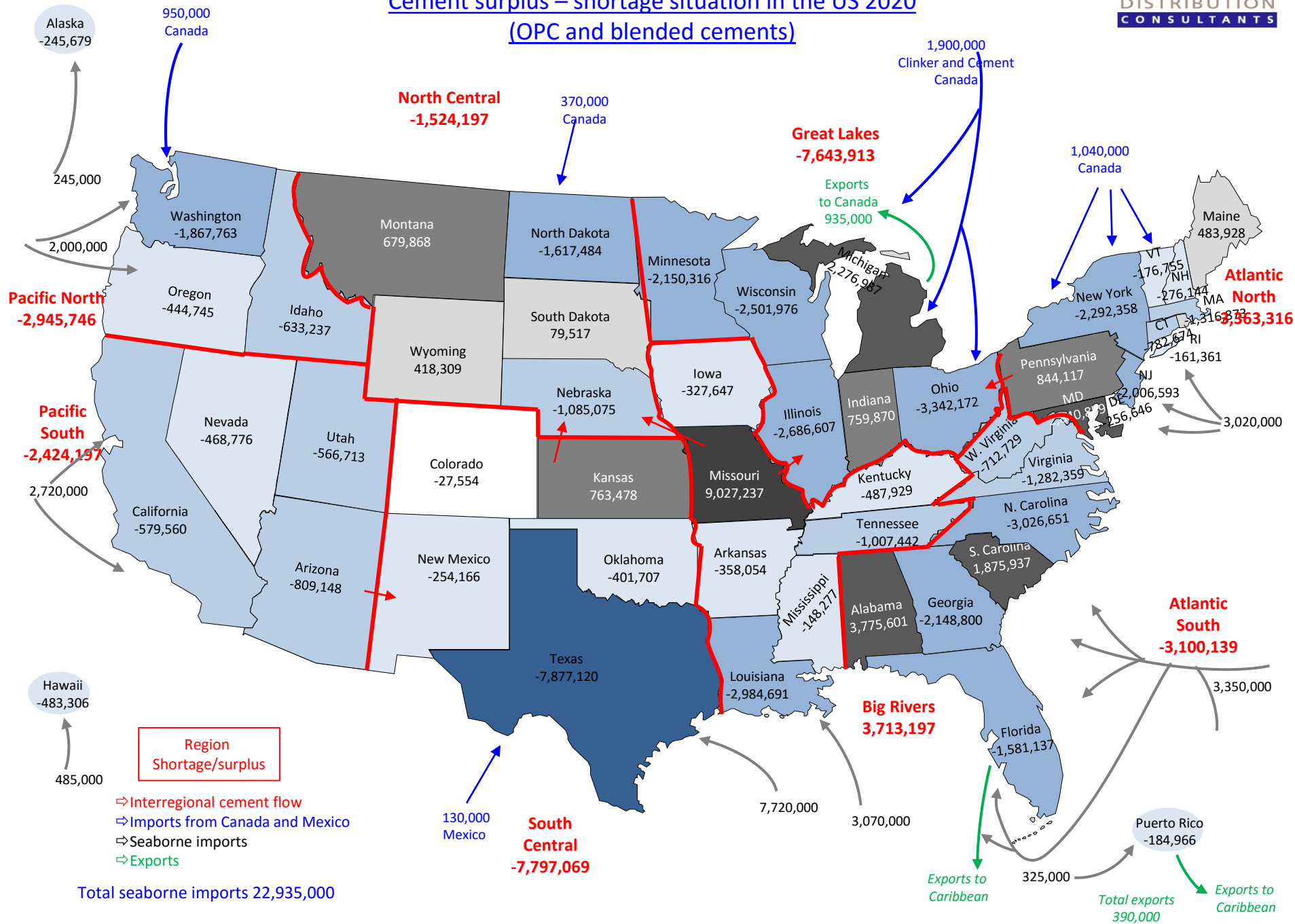


An old lady back to life!

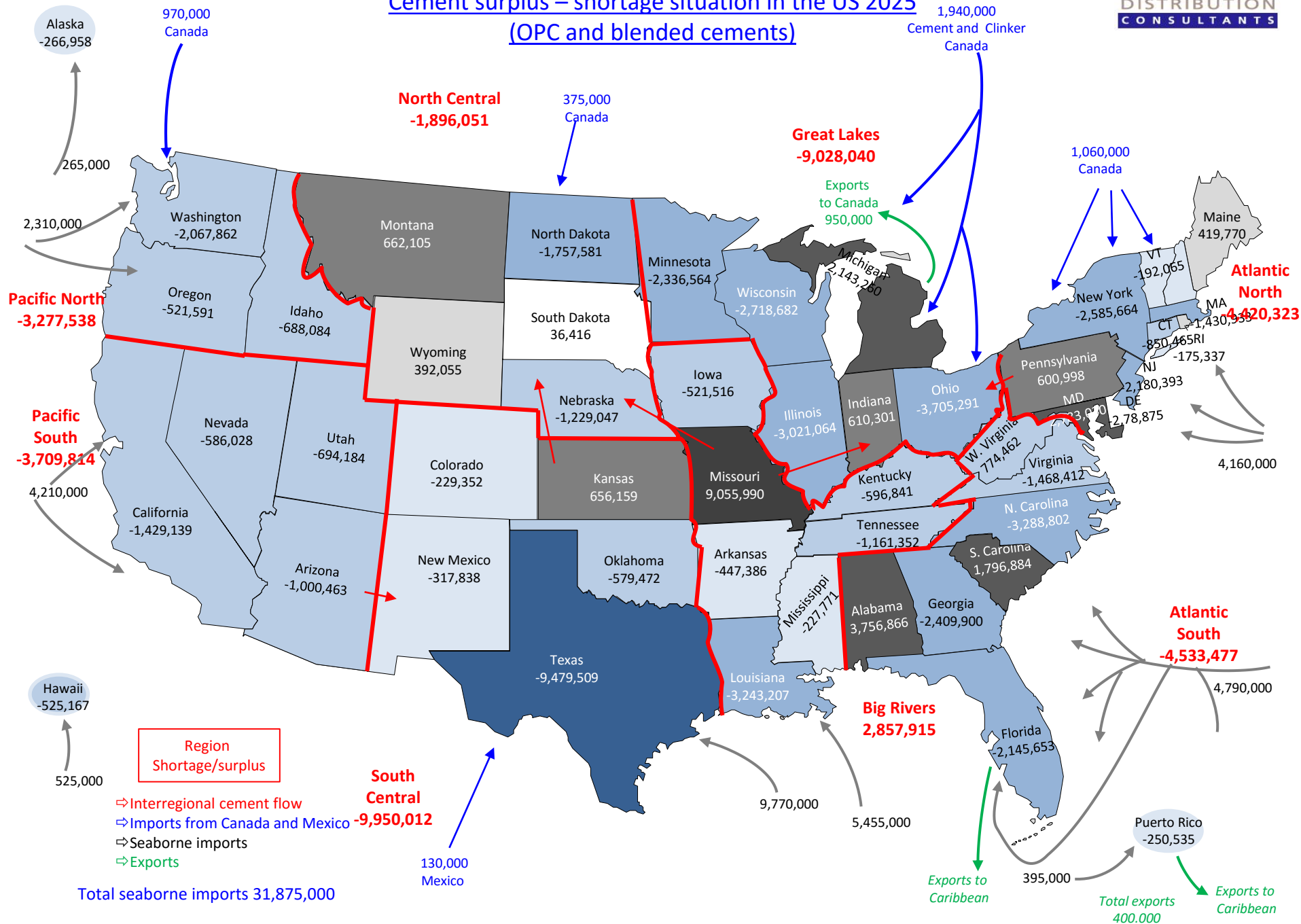
Cement surplus – shortage situation in the US 2014 (OPC and blended cements)



Cement surplus – shortage situation in the US 2020 (OPC and blended cements)



Cement surplus – shortage situation in the US 2025 (OPC and blended cements)



How suitable are US terminals still after the crisis?

	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



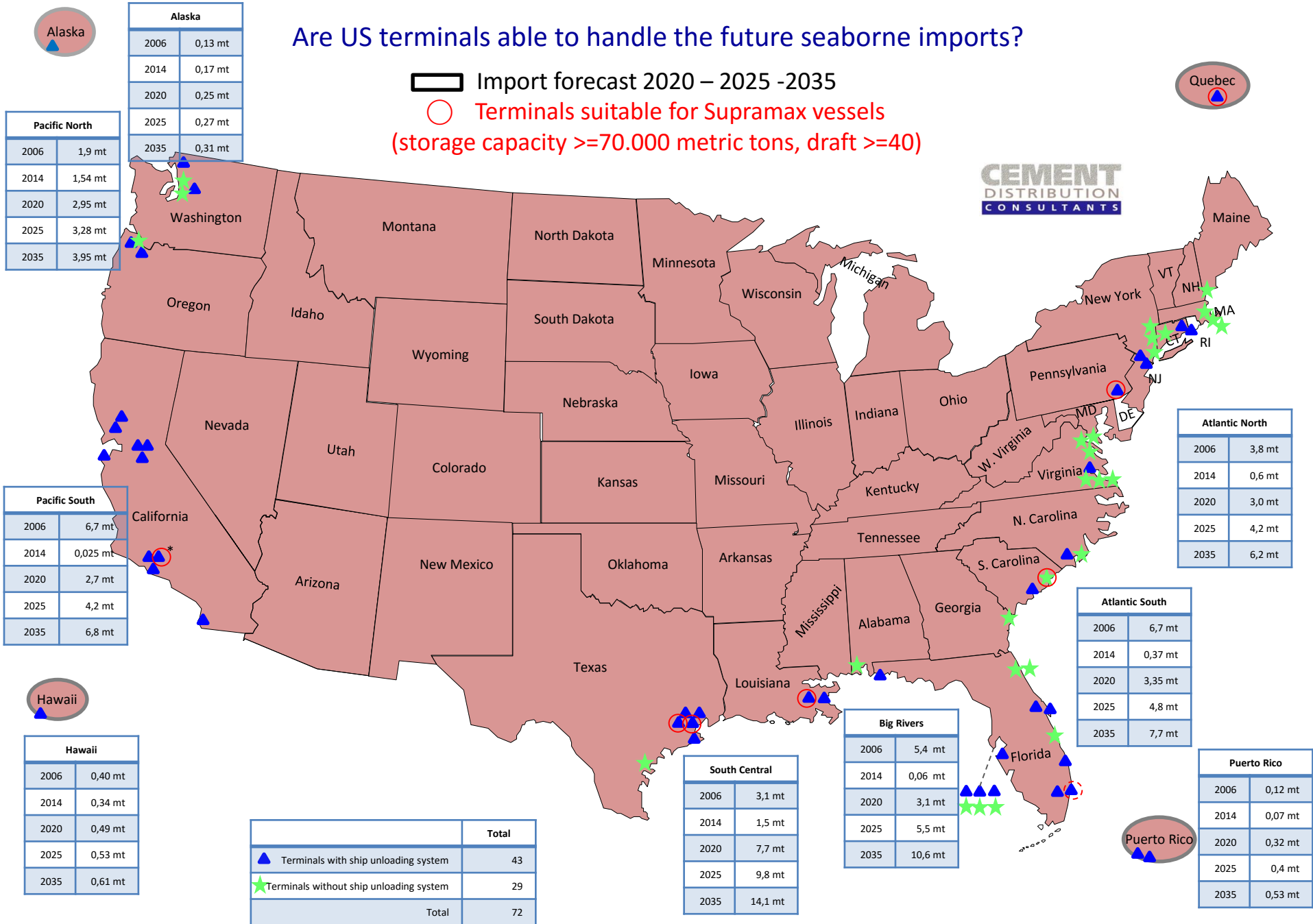
Storage capacity of US cement terminals

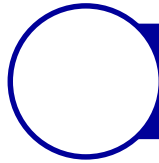
Are US terminals able to handle the future seaborne imports?

Import forecast 2020 – 2025 -2035

○ Terminals suitable for Supramax vessels
(storage capacity >=70.000 metric tons, draft >=40)

CEMENT
DISTRIBUTION
CONSULTANTS

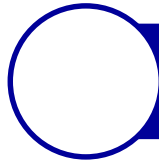




Final considerations

The combination of very low FOB prices for cement exports and very low shipping costs makes it possible to import bulk cement into the US for CIF \$55,- / metric tonne (or less). This makes new plant construction or large plant capacity expansions in the US unattractive and closure of older production capacity more likely.

It will still take more than a decade before US imports are back to the record 2006 level. This means that the current cement import terminals shall have sufficient capacity and even new terminals are already being built. However, terminal ownership is out of balance with current US market shares. This means that some US producers have to create import capability to keep market share.



Final considerations

The US terminals have nearly all been designed for Handymax vessels and are ill suited for Supramaxes. At this moment this is not too much of a problem but it will become an issue in the coming years. Terminals will need to be expanded.

Demand in North America for cementitious materials will grow whilst domestic supply is becoming more difficult. This means more imports of cementitious materials which requires very large multi product import terminals. At present only two facilities have this capability.

New players face the large difficulty of realising new terminal facilities which can be costly and time consuming. The Mississippi – Missouri waterway system offers perhaps the easiest access. After transshipment of cement or clinker from bulk carrier to barges, relatively small import facilities are needed.

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 terminal with the largest annual 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

Copyrighted material 2010. 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.

CEMENT DISTRIBUTION CONSULTANTS

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

Cargo system for storage: Sub conveyor system driven by electric

Storage facility

Type: Silo

Capacity: 160,000 tons

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

CEMENT DISTRIBUTION CONSULTANTS

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



**CEMENT
DISTRIBUTION
CONSULTANTS**

THANK YOU

adligthart@cementdistribution.com

www.cementdistribution.com