



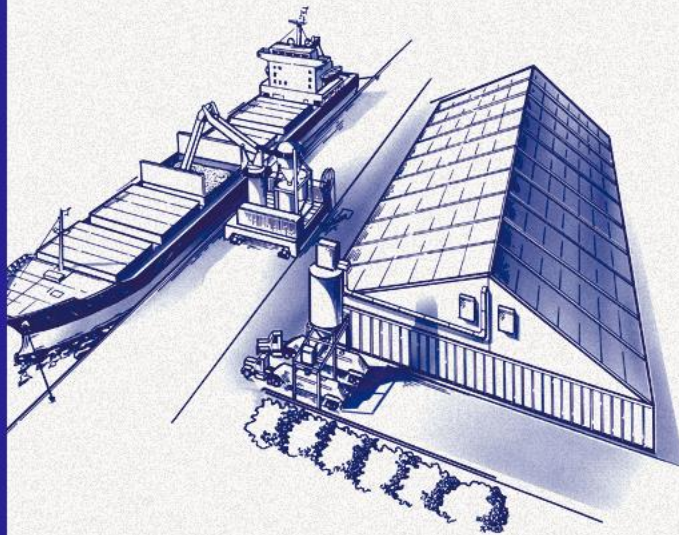
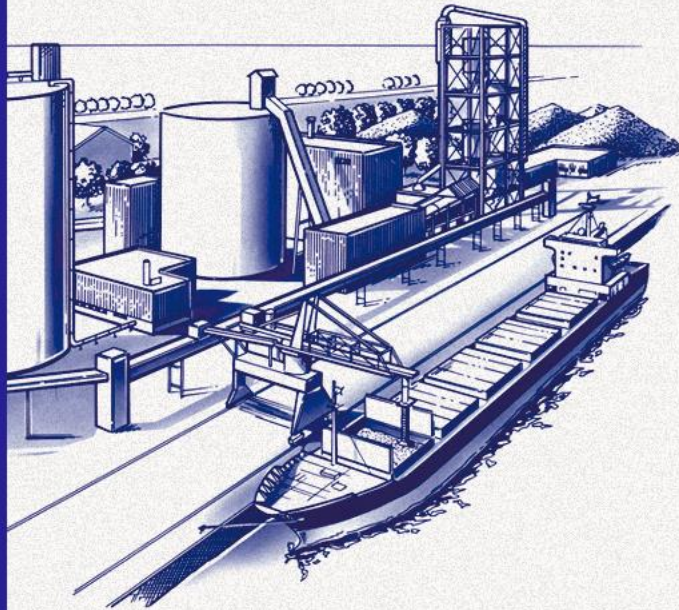
North American cement and clinker imports

-

An in-depth analysis

Ad Ligthart


Las Vegas 29 November 2017

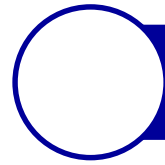


CEMENT
DISTRIBUTION
CONSULTANTS

Cement Distribution Consultants

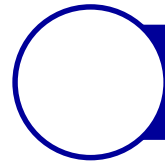
an introduction

Market knowledge	Consulting	Market knowledge
<ul style="list-style-type: none"> The global cement industry on Google Earth. The most comprehensive global database on waterside cement plants, waterside grinding plants and terminals. www.cementdistribution.com (a free and comprehensive website on cement trade and distribution). Authors of the Handbook on Global Cement Trade and Distribution. 35 Years experience. 	<ul style="list-style-type: none"> The ability to advise customers on every aspect of cement and clinker trade and distribution including strategic, economical, logistical, technical and operational aspects as well as sourcing, shipping, facilities, handling systems, etc., etc. A clear vision on port and facility design that can adapt to changing trade and industry conditions. Projects realised on every continent. Currently consultant to 5 terminal projects in North America of which the two largest cement terminals in the world. 	<ul style="list-style-type: none"> The global cement industry on Google Earth. The most comprehensive global database on waterside cement plants, waterside grinding plants and terminals. www.cementdistribution.com (a free and comprehensive website on cement trade and distribution). Authors of the Handbook on Global Cement Trade and Distribution. 35 Years experience.



Introduction





INTRODUCTION



Seaborne cement imports in the US in 2017 are forecasted to reach about 10,1 million tons in 2017. This is substantially higher than at the bottom of the crisis years when 2,95 million tons was imported by sea in 2010. However, it is still very substantially less than before the crisis when over 30 million tons was imported by sea in 2006. Just opening up the existing terminals which were either mothballed or used for domestic distribution would be more than sufficient to handle current and coming seaborne import levels, especially taking into account that many terminals were just completed before the crisis. Yet more than 13 terminal expansion and newbuilding projects are underway or planned in the US and Canada.



Why is there so much new terminal construction in North America?

Google Earth

Contents of presentation

- 
- Global trade developments
 - US cement market developments
 - What is happening with the existing US terminals?
 - What is behind all this new terminal construction?
 - Current design philosophies
 - Final considerations



Global trade developments

Global trade developments

- A glut of exportable clinker and cement volumes has developed with a downward pressure on F.O.B prices. This glut will stay for quite some time.
 - Long-term very substantial overcapacity in China
 - Iran, Saudi Arabia, Indonesia (re) enter the market
 - Turkey, Vietnam, Pakistan keep adding capacity larger than their consumption growth
 - Structural cement surpluses in South Europe, UAE, Thailand, etc.
- Shipping prices are slowly but steadily rising but remain very low compared to pre-crisis levels
- Trade in cementitious materials is growing and becomes more global

Developments in cement and clinker trade

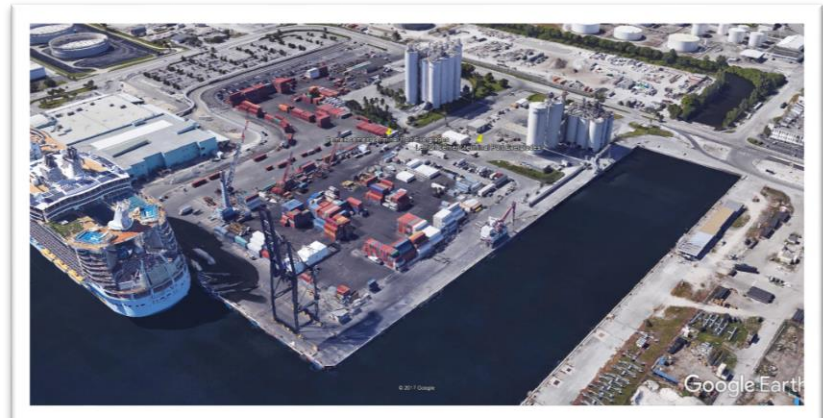
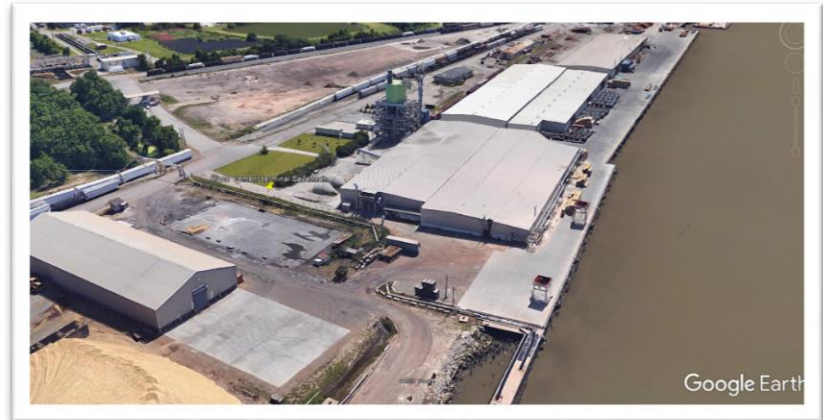
Global trade developments

Global seaborne trade in cement and clinker in 2016 reached approx. 117 mt. In addition another 94 mt was distributed by sea domestically. Inland water domestic transport totalled approx. 21 mt. (excl. China).

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.

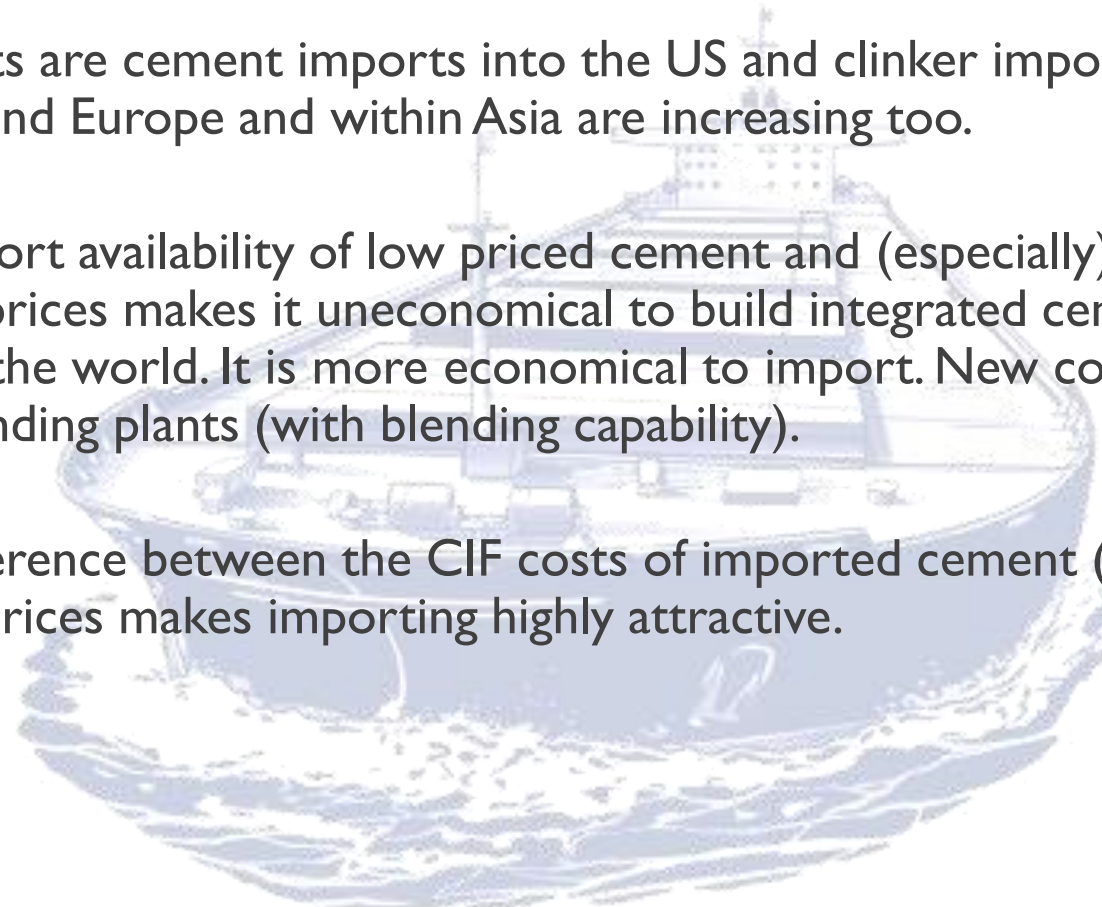
Seaborne domestic distribution in 2016 consisted of approx. 10 mt clinker 73 mt bulk cement and 11 mt of bagged cement.

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.



Global trade developments

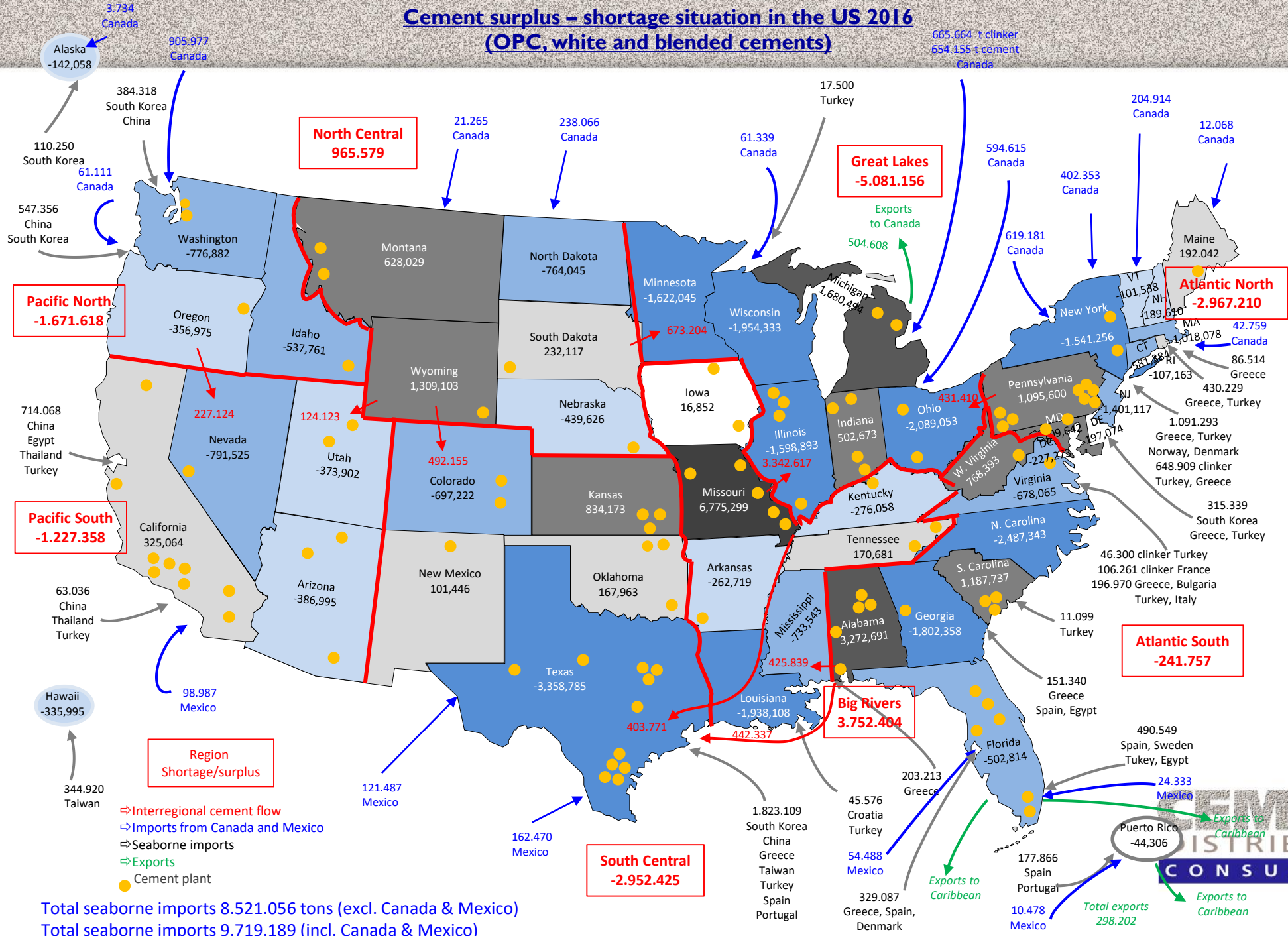
- Key growth markets are cement imports into the US and clinker imports into Africa but regional trade around Europe and within Asia are increasing too.
- The long-term export availability of low priced cement and (especially) clinker, in combination with low shipping prices makes it uneconomical to 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).
- The very large difference between the CIF costs of imported cement (or clinker) and domestic cement prices makes importing highly attractive.



Developments in cement and clinker trade



(OPC, white and blended cements)



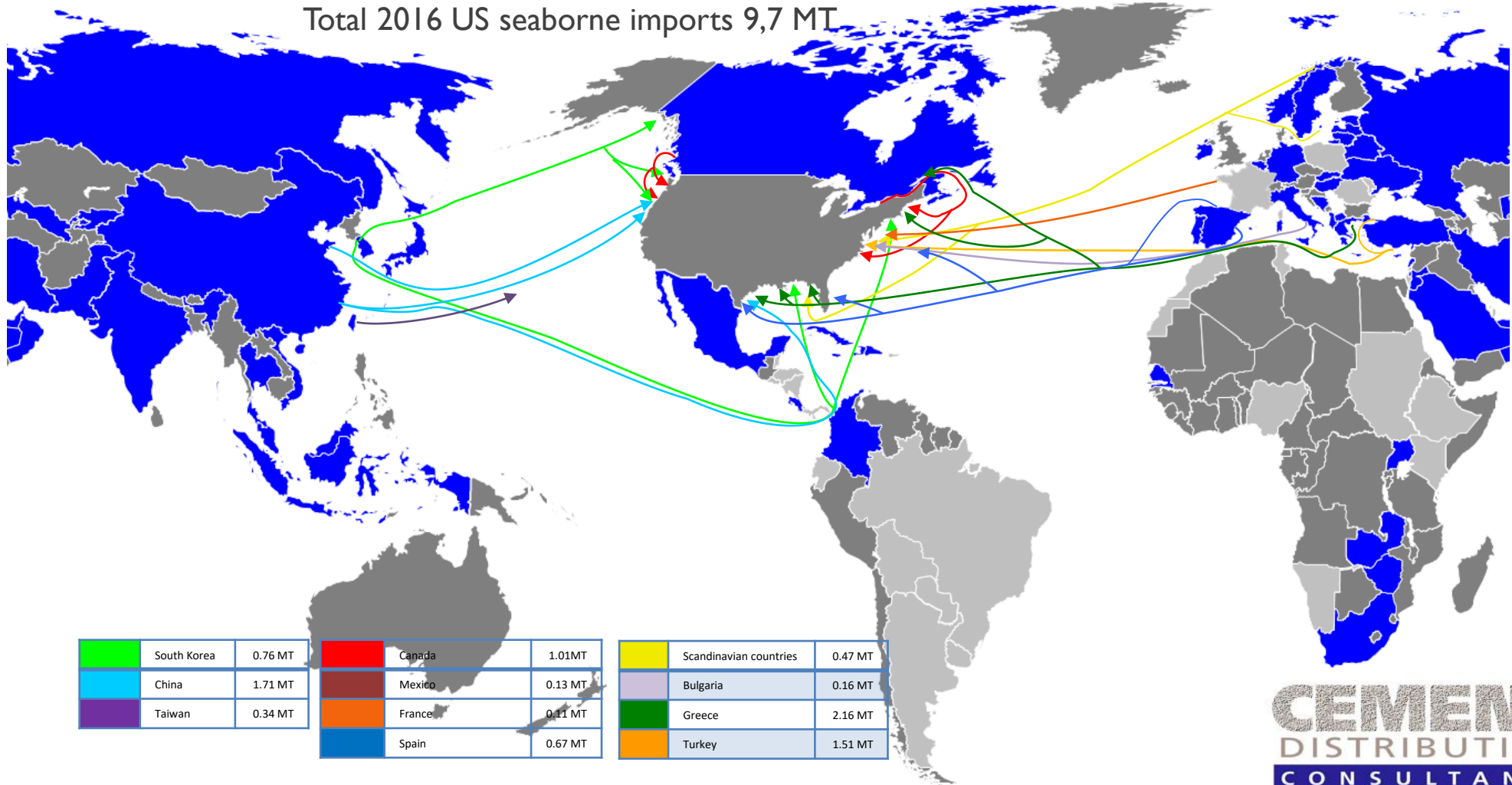
Total seaborne imports 8.521.056 tons (excl. Canada & Mexico)

Total seaborne imports 9.719.189 (incl. Canada & Mexico)

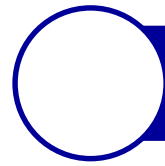
- States with a higher cement production than cement consumption are shown in shades from light grey to black.
- States with a higher cement consumption than cement production are shown in shades from light blue to dark blue.
- Figures are based on USGS consumption and production figures. Where production figures were given per group of states, the production figure per states has been estimated by Cement Production Consultants
- Seaborne import shipments of less than 500 tons have not been taken into account.

US cement market developments

Total 2016 US seaborne imports 9,7 MT



Total Asia 2.81 MT Total Canada + Mexico 1,14 MT Total Europe 5.08 MT Total small volumes 0,67 MT (incl. South America.)



US cement market developments

- US seaborne cement imports which rapidly increased in 2014, 2015 and 2016 slowed down in 2017 with estimated cement imports staying about level with 2016 with a total of about 9,8 million tons to a total of about 10,5 million tons. The slowdown in growth is a bit against expectations. The regions that have slowed down most are the North West and Gulf area. The South West and North East are still growing more strongly.
- Generally though expectations for the coming years are quite good with hopes that the figure of over 30 million tons of seaborne imports will be reached again in 5-7 years and might be even surpassed after that. The level of new terminal expansions and new buildings is a good indication of this.



What is happening with the existing US terminals?
“4 Key questions”

What is happening with the existing US terminals?



I) Are new terminals needed because of shifting import patterns?

US cement terminals during the crisis (2010)

Alaska

Quebec

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

Total seaborne imports 2.75 mt

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

Hawaii

Hawaii	
2006	0,40 mt
2010	0,35 mt

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

Giant closes and sells terminal in Chesapeake

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

Big Rivers	
2006	5,4 mt
2010	0 mt

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

South Coast Cement terminal switched over from cement to fertilizer

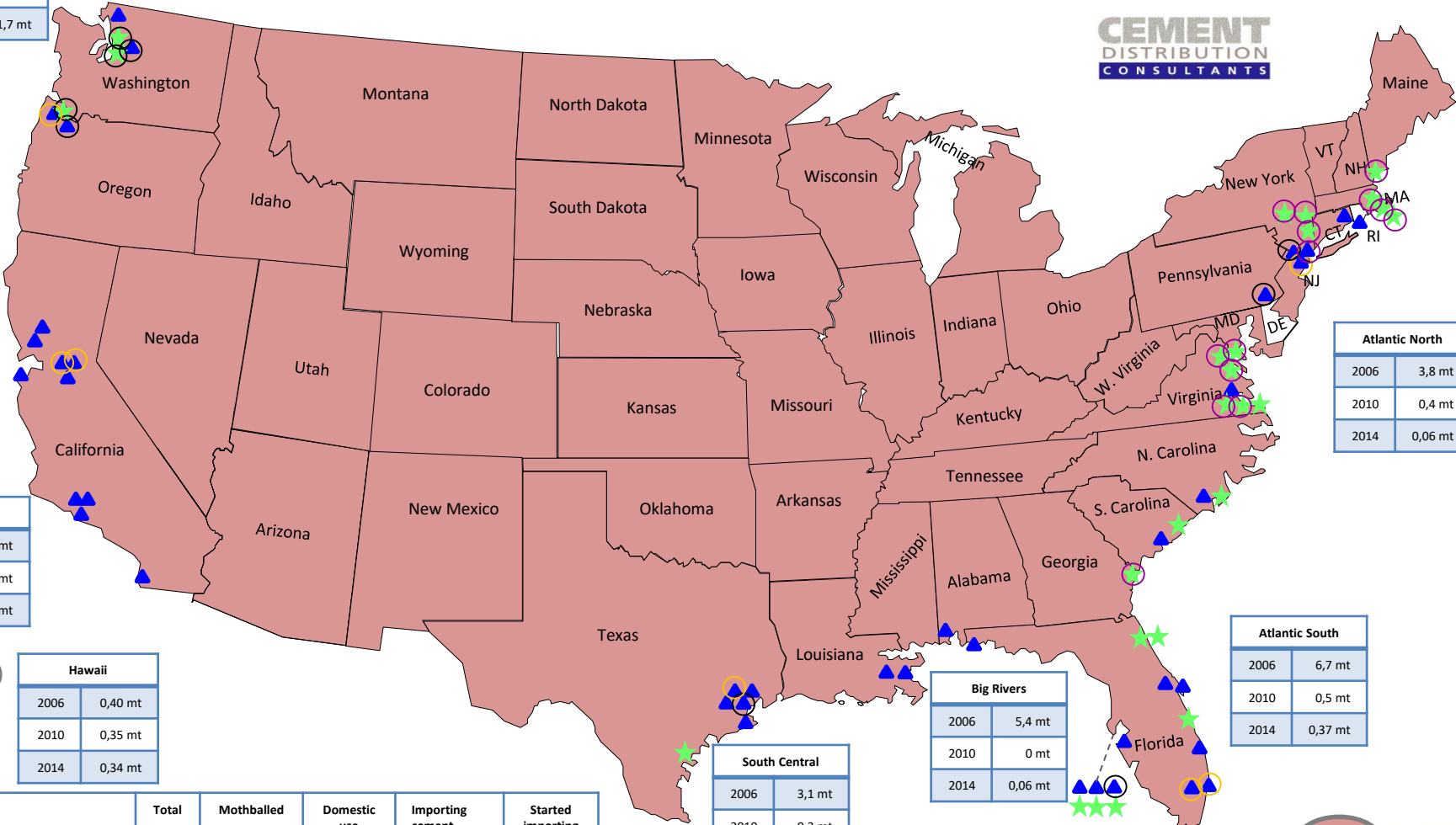
Puerto Rico

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	Total	Mothballed	Domestic use	Importing cement during crisis
Terminals with ship unloading system	46	38	0	8
Terminals receiving self-discharging vessels	26	8	13	5
Total	72	46	13	13

US cement terminals in 2014

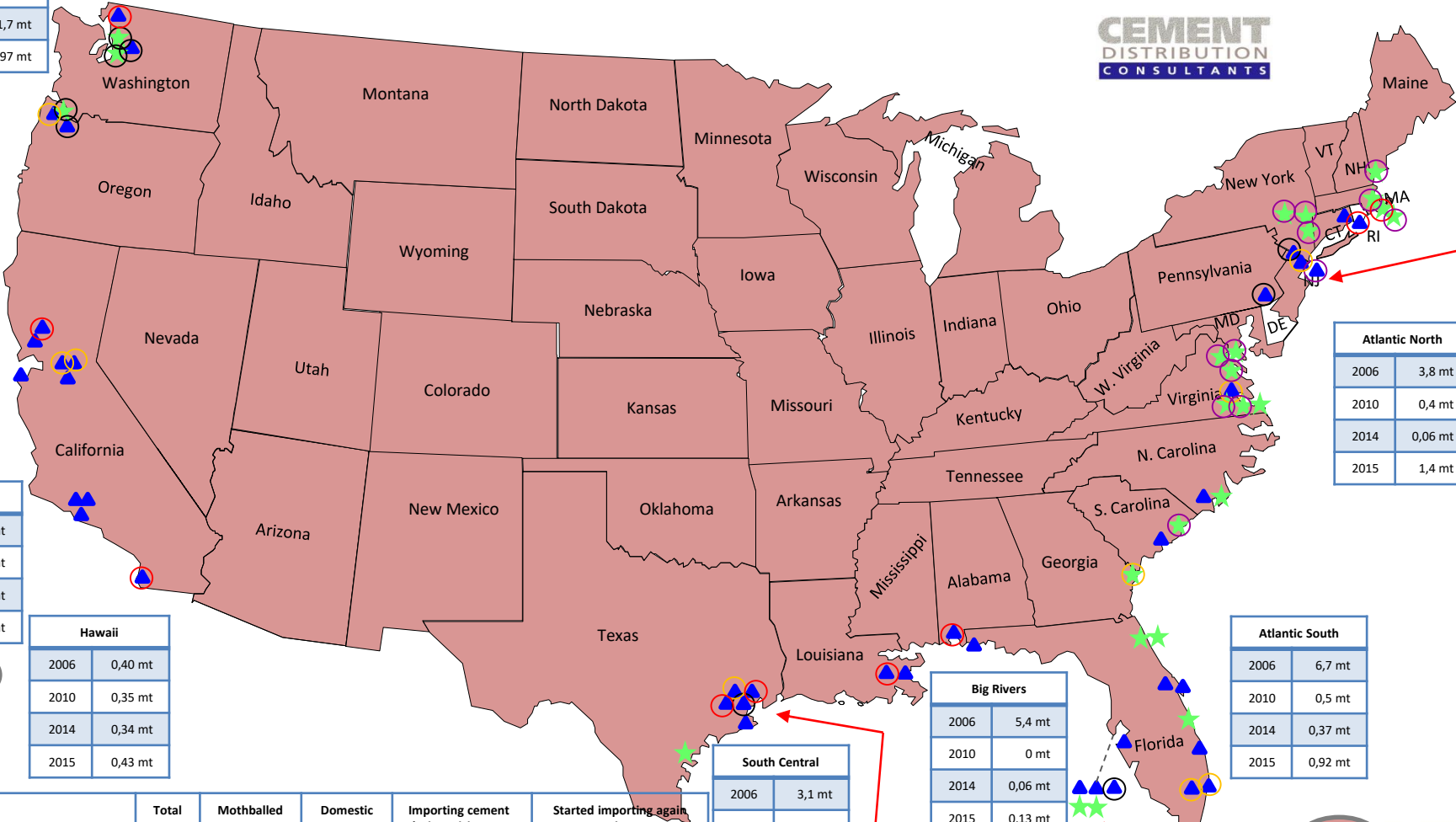
Pacific North	
2006	2,1 mt
2010	1,0 mt
2014	1,7 mt



	Total	Mothballed	Domestic use	Importing cement during crisis	Started importing again in
▲			○	○	2014
★ Terminals with ship unloading system	46	31	1	8	7
Terminals receiving self-discharging vessels	26	10	13	3	0
Total	72	41	13	11	7

US cement terminals in 2015

Pacific North	
2006	2,1 mt
2010	1,0 mt
2014	1,7 mt
2015	1,97 mt



Atlantic North	
2006	3,8 mt
2010	0,4 mt
2014	0,06 mt
2015	1,4 mt

Atlantic South	
2006	6,7 mt
2010	0,5 mt
2014	0,37 mt
2015	0,92 mt

Big Rivers	
2006	5,4 mt
2010	0 mt
2014	0,06 mt
2015	0,13 mt

South Central	
2006	3,1 mt
2010	0,3 mt
2014	1,5 mt
2015	2,2 mt

Pacific South	
2006	6,7 mt
2010	0,2 mt
2014	0,03 mt
2015	0,43 mt

Hawaii	
2006	0,40 mt
2010	0,35 mt
2014	0,34 mt
2015	0,43 mt

	Total	Mothballed	Domestic use	Importing cement during crisis	Started importing again in	
					2014	2015
Terminals with ship unloading system	45	20	1	8	7	9
Terminals receiving self-discharging vessels	25	8	13	3	0	1
Total	70	28	14	11	7	10

Argos adds ship unloader to Houston terminal

Cemex closes terminal and acquires Holcim terminal

NYEMCO opens again and receives domestic cement

Quebec

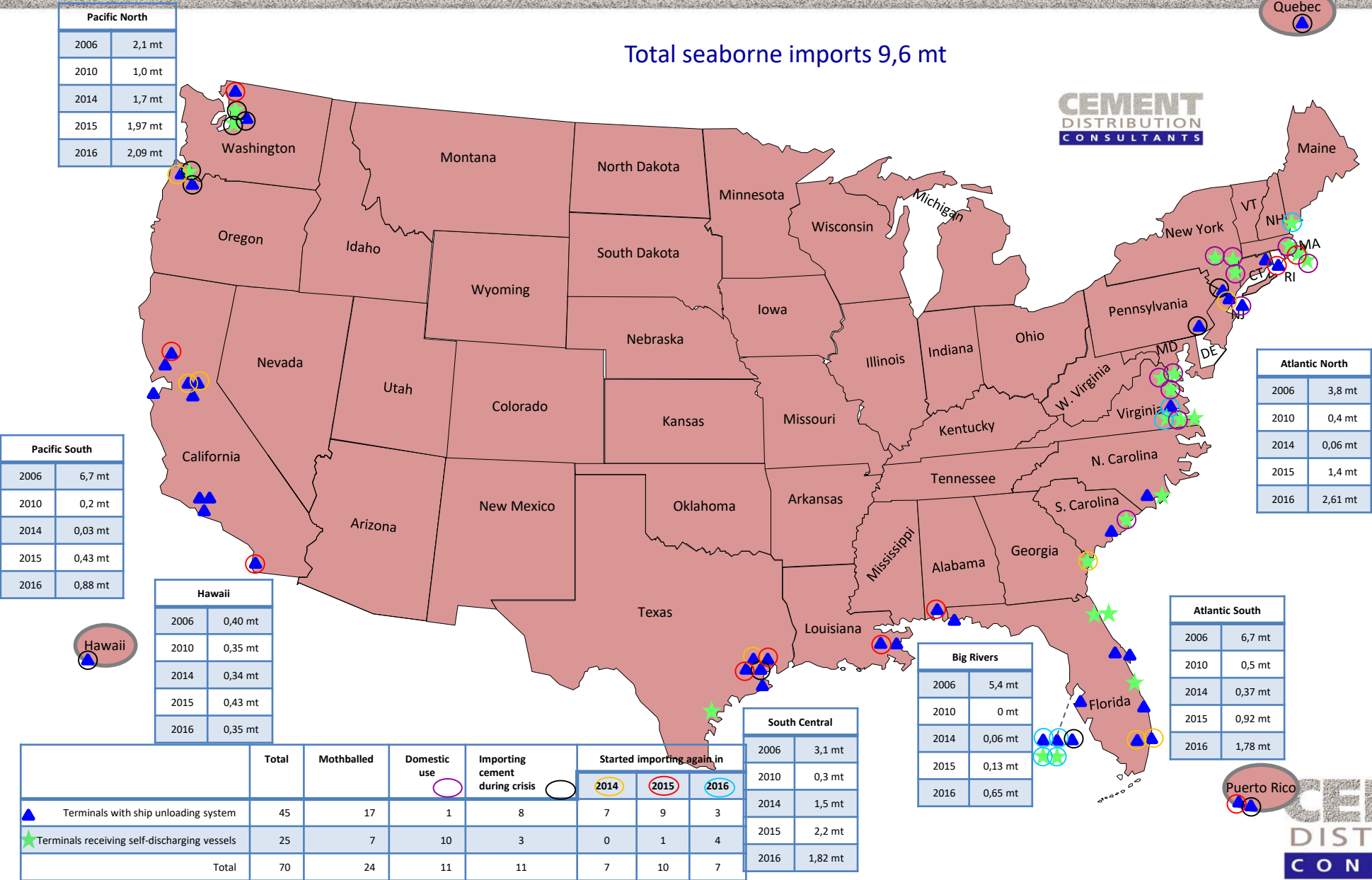
Puerto Rico

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US cement terminals in 2016

Total seaborne imports 9,6 mt



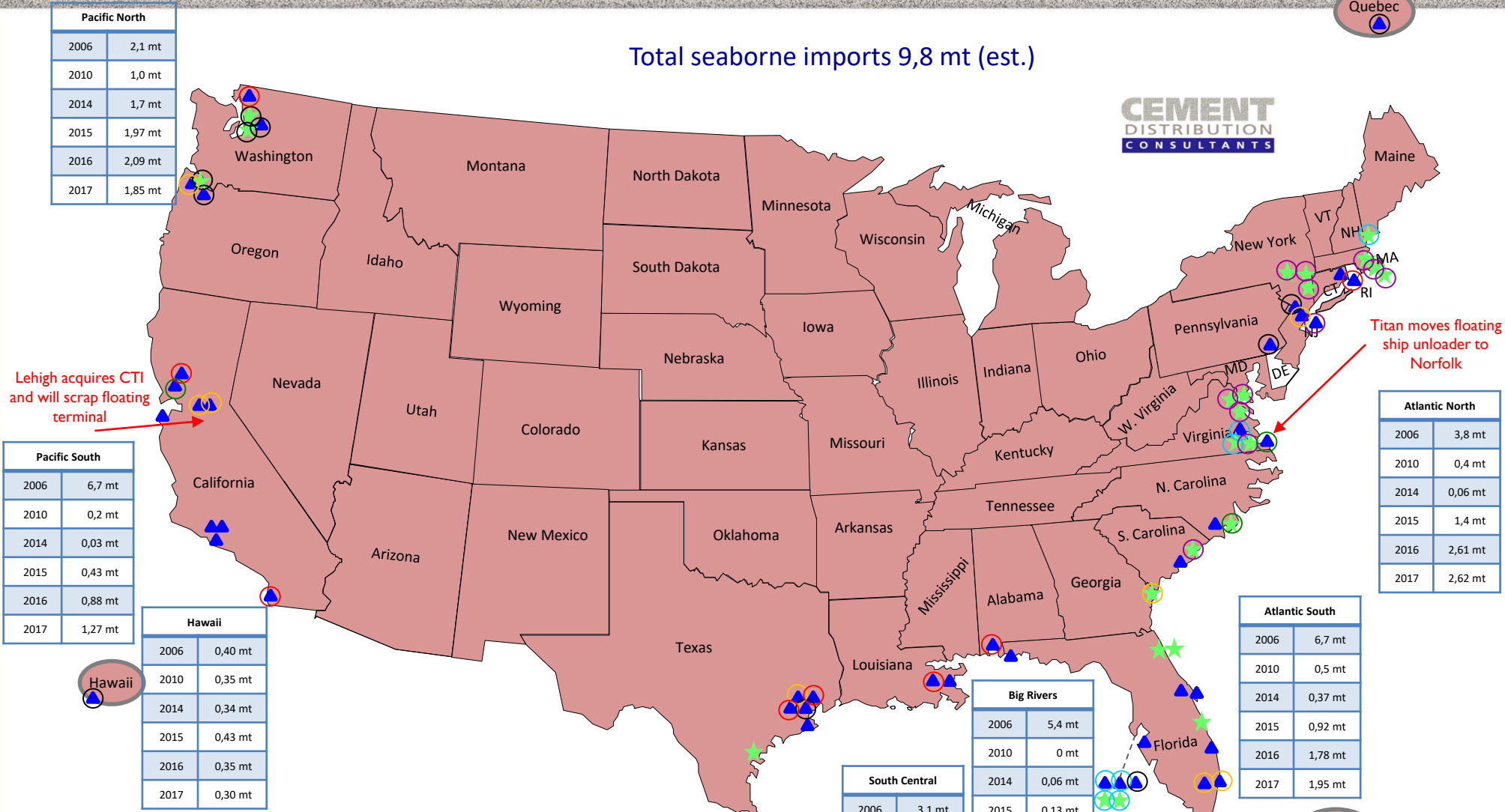
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CEMENT
DISTRIBUTION
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US cement terminals in 2017

Total seaborne imports 9,8 mt (est.)

CEMENT
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	Total	Mothballed	Domestic use	Importing cement during crisis	Started importing again in			
					2014	2015	2016	2017
▲ Terminals with ship unloading system	45	15	1	8	7	9	3	3
★ Terminals receiving self-discharging vessels	24	19	10	3	0	1	4	1
Total	69	341	11	11	7	10	7	3

Puerto Rico

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What is happening with the existing US terminals?



I) Are new terminals needed because of shifting import patterns?

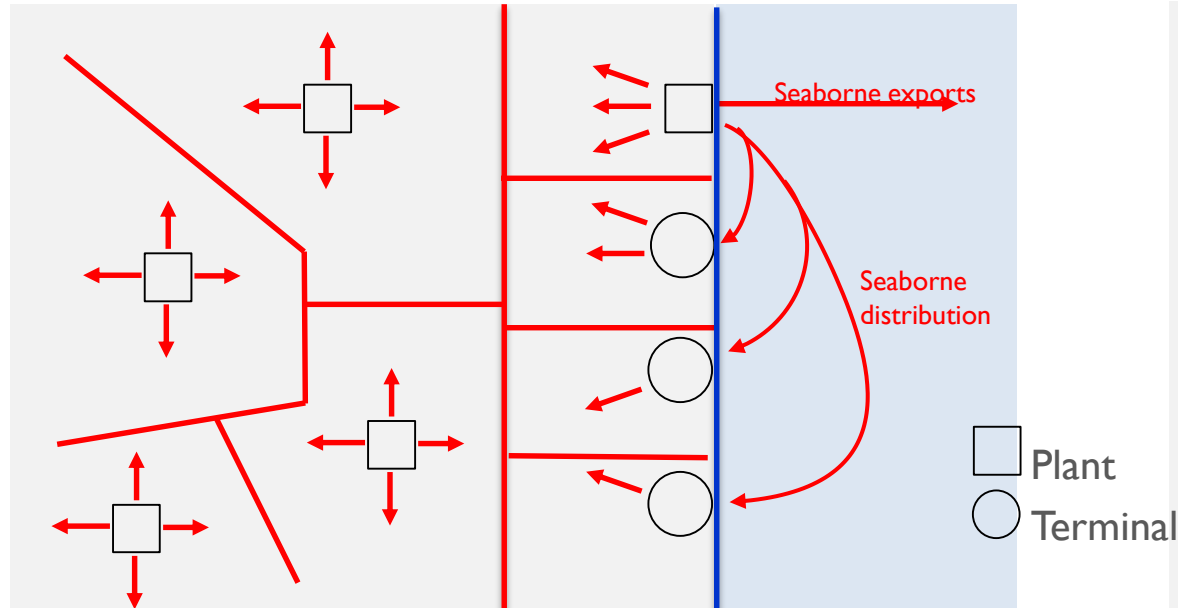
No, although import patterns are shifting somewhat, the existing terminals are still sufficient to handle the volumes.

What is happening with the existing US terminals?

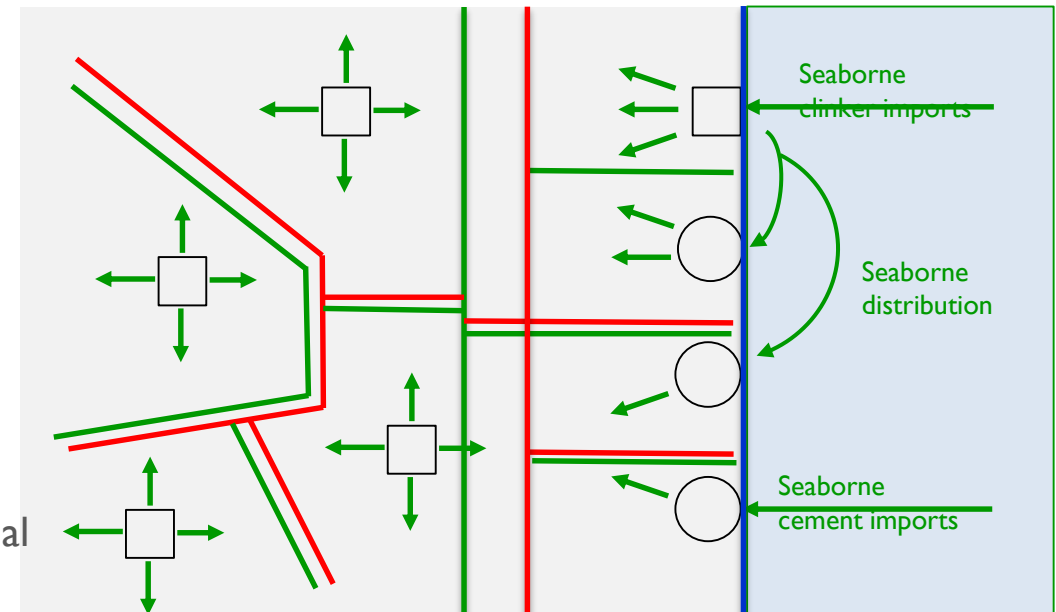


- 2) Are new terminals needed because of an unbalanced ownership situation?

What is happening with the existing US terminals?

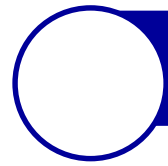


Market areas and cement flows in over supply situation.



Market areas and cement flows in a shortage situation.

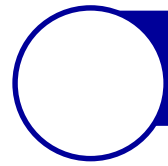
The ownership of cement terminals matters a lot. Cement terminals work best in a network with cement plants and allow plants to have maximum possible utilisation in both surplus and shortage periods and to keep market share.



What is happening with the existing US terminals?

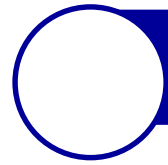
Table I
North American cement producers with seaborne import capability

Lafarge Holcim
Lehigh
Cemex
Ash Grove
Buzzi Unicem
Argos
California Portland Cement (CPC)
Titan
Mitsubishi
American



What is happening with the existing US terminals?

Table 2 North American cement producers without seaborne import capability		
Eagle Materials		Federal White
St. Marys (Votorantim		Drake
CRH		Colacem
GCC		Armstrong
Martin Marietta		Capital
Giant		Royal
National		Sumter
Continental		
Quebec		



What is happening with the existing US terminals?

Table 3
Import facilities not owned by North American
cement producers

Pan Pacific Cement (50%)
Hawaiian (KRC)
Riverside Construction Materials
Beton Provincial

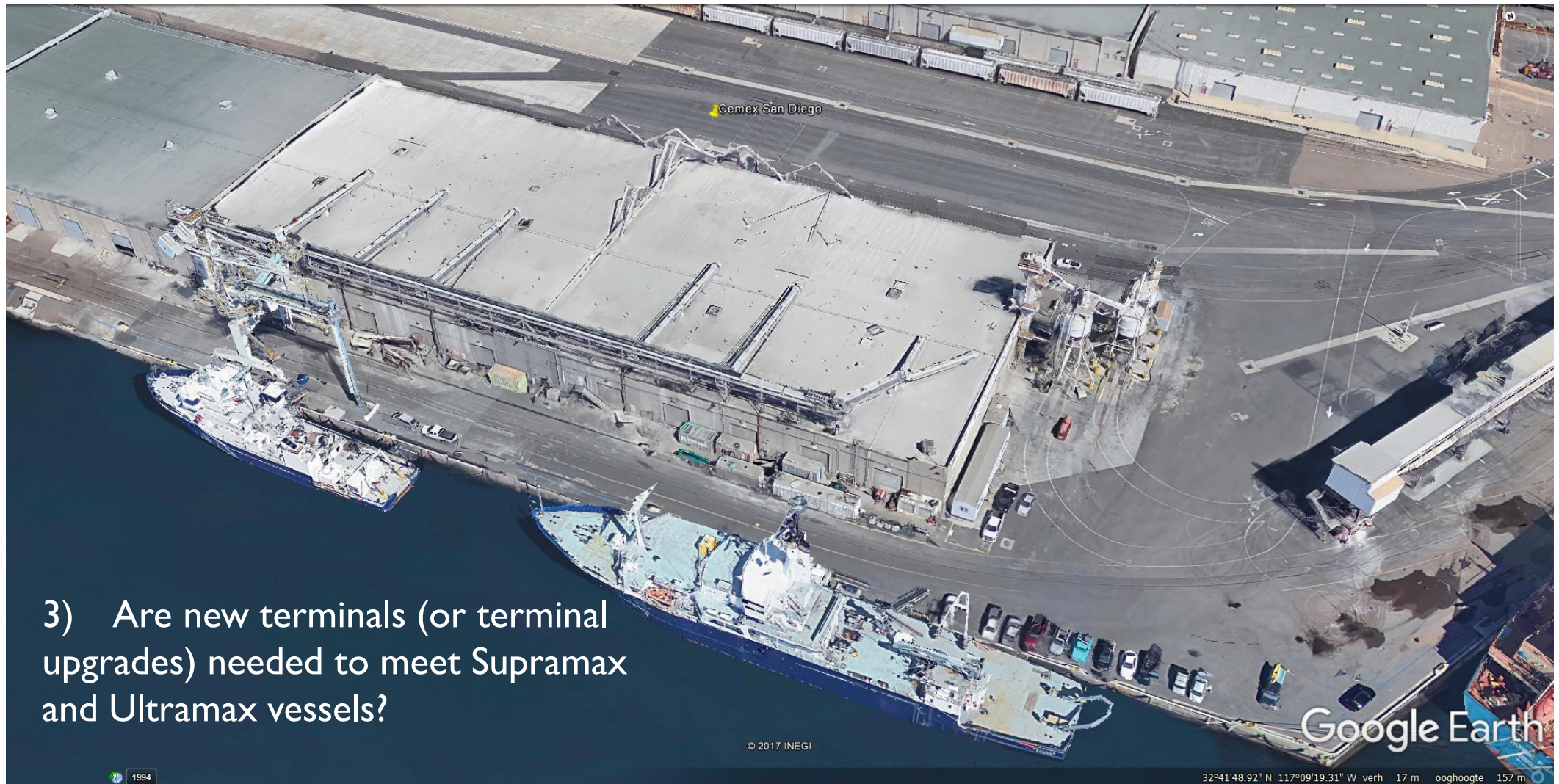
What is happening with the existing US terminals?

2) Are new terminals needed because of an unbalanced ownership situation?

With US cement plants nearing full capacity, US cement producers would need import capability to keep market share. Several lack this capability and so would have an interest in new terminal facilities.



What is happening with the existing US terminals?



3) Are new terminals (or terminal upgrades) needed to meet Supramax and Ultramax vessels?

What is happening with the existing US terminals?

Bigger and bigger ships					
	Handysize 30.000	Handymax 40.000	Supramax 50.000	Ultramax 60.000	Panamax 75.000
Loa	170	180	190	200	220
B	28	30	32.3	32.3	32.3
H	9.5	10.5	12.0	13.3	13.5



HANDYMAX

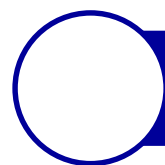


SUPRAMAX



ULTRAMAX

Bigger and bigger ships



What is happening with the existing US terminals?

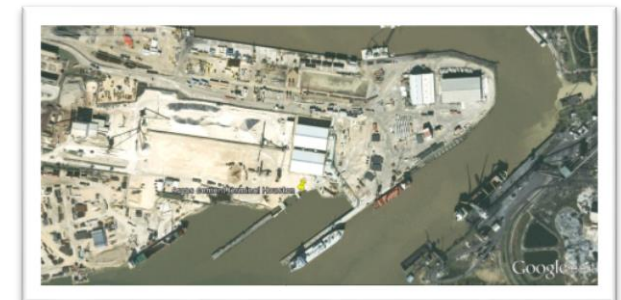
Required storage capacity					
Ship type	Cargo capacity	250.000 tpy	500.000 tpy	750.000 tpy	1.000.000 tpy
Handysize	30.000	37.705	45.411	53.116	60.822
Handymax	40.000	46.849	53.699	60.548	67.397
Supramax	50.000	55.993	61.986	67.979	73.973
Ultramax	60.000	65.137	70.274	75.411	80.548
Panamax	75.000	78.853	82.705	86.558	90.411

Based on 15 days of buffer capacity and a ship unloading rate of 8.000 tpd

When multiple cement types are imported a calculation has to be made for every material separately

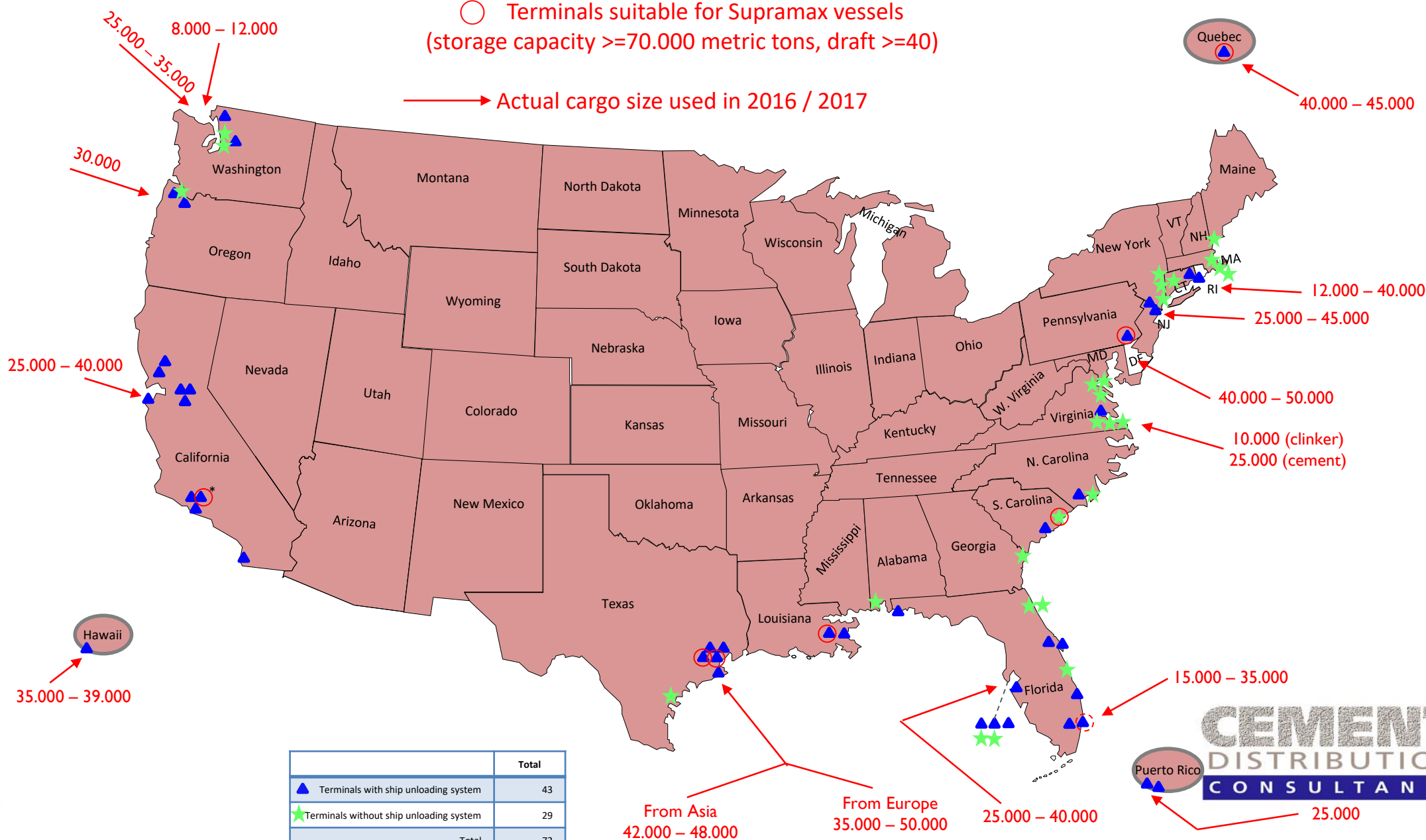
And what is the reality?

	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 bigger vessels



	Total
▲ Terminals with ship unloading system	43
★ Terminals without ship unloading system	29
Total	72

US cement market developments

Total seaborne import volume 2016 is 9,7 million tons

Of which 20% in cargo sizes <20.000 tons
 45% in cargos size between 20.000 and 40.000 tons
 35% in cargo sizes > 40.000 tons

The largest cargo size was 52.000 tons

The current combination of low F.O.B. prices for exported cement and low shipping costs allows for this far from optimal shipping situation. This likely will continue for the next few years. But shipping prices are already improving and there will be times coming that the transport cost difference between Handysize, Handymax, Supramax and Ultramax vessels will be decisive for the viability of US cement imports.

What is happening with the existing US terminals?



3) Are new terminals (or terminal upgrades) needed to meet Supramax and Ultramax vessels?

Yes. Most US terminals have ship unloaders that would be able to unload larger vessels but the average storage capacity is far too low and needs to be expanded or new larger facilities need to be build.

What is happening with the existing US terminals?

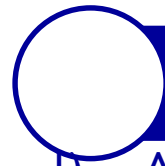


- 4) Are new terminals needed because multiple material handling capacity is lacking?

What is happening with the existing US terminals?

- 4) Are new terminals needed because multiple material handling capacity is lacking?

When multiple materials can be imported as partial cargo (being part of a cement shipment) about 50% of North American import terminals would be able to do so. When multiple materials would arrive in separate shipments (of at least 15,000 tons) only about 4-5 would have this capability.



What is happening with the existing US terminals?

1) Are new terminals needed because of shifting import patterns?

No although import patterns are shifting somewhat, the existing terminals are still sufficient to handle the volumes.

2) Are new terminals needed because of an unbalanced ownership situation?

With US cement plants nearing full capacity all US cement producers would need import capability to keep market share. Quite a few lack this capability and so would have an interest in new terminal facilities.

3) Are new terminals (or terminal upgrades) needed to meet Supramax and Ultramax vessels?

Yes. Most US terminals have ship unloaders that would be able to unload larger vessels but the average storage capacity is far too low and needs to be expanded or new larger facilities need to be built.

4) Are new terminals needed because multiple material handling capacity is lacking?

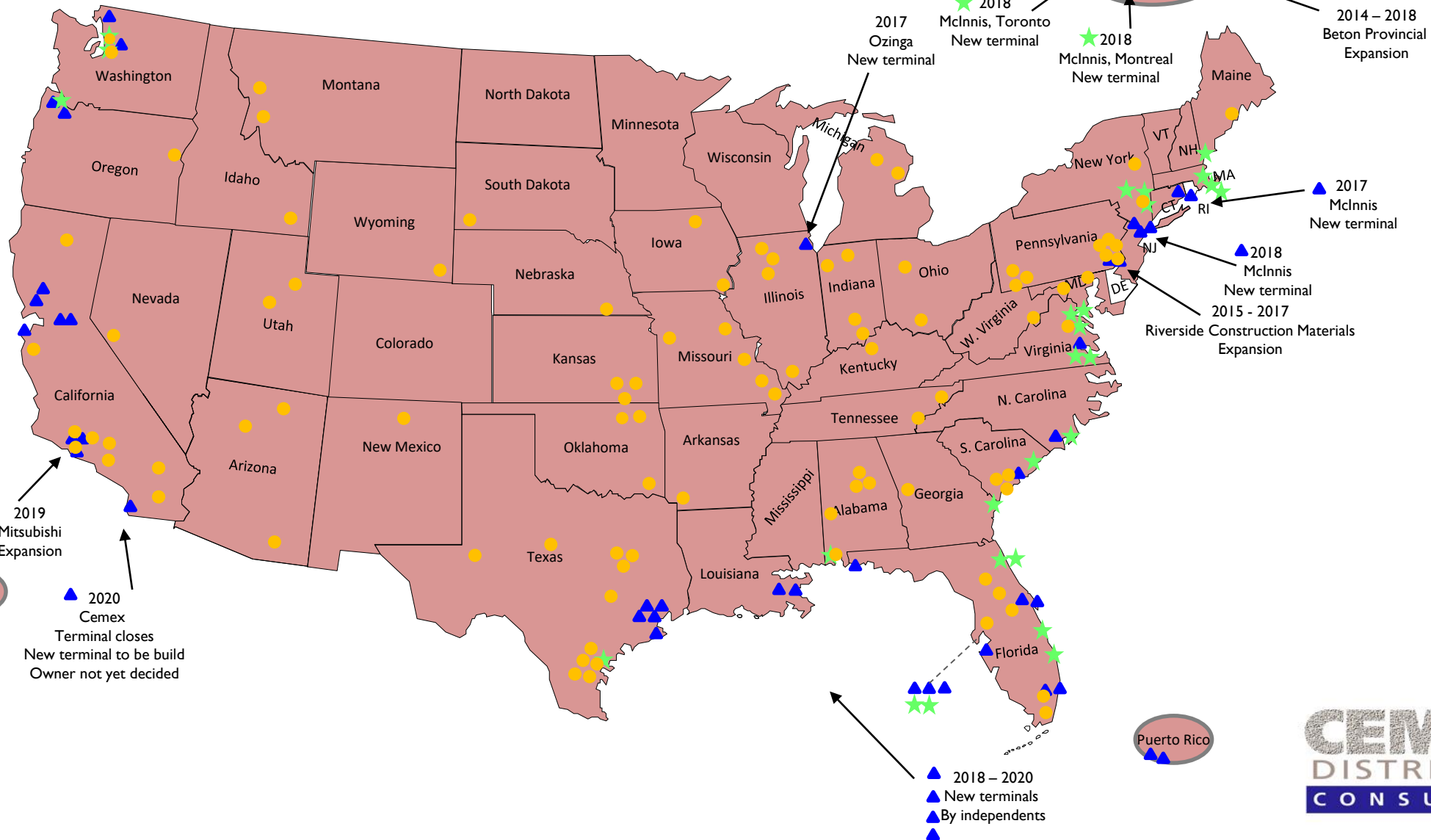
When multiple materials can be imported as partial cargo been part of a cement shipment about 50% of North American import terminals would be able to do so. When multiple materials would arrive in separate shipments (of at least 15,000 tons) about 4-5 would have this capability.

**ARE THERE OTHER QUESTIONS THAT NEED TO BE ASKED TO EXPLAIN
THE CURRENT WAVE OF TERMINAL EXPANSIONS AND NEWBUILDINGS?**



What is behind the new terminal construction?

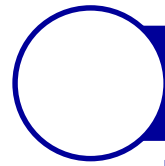
Alaska



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Current design philosophies



Current design philosophies

Planning and reality

YOUR "PLANS"

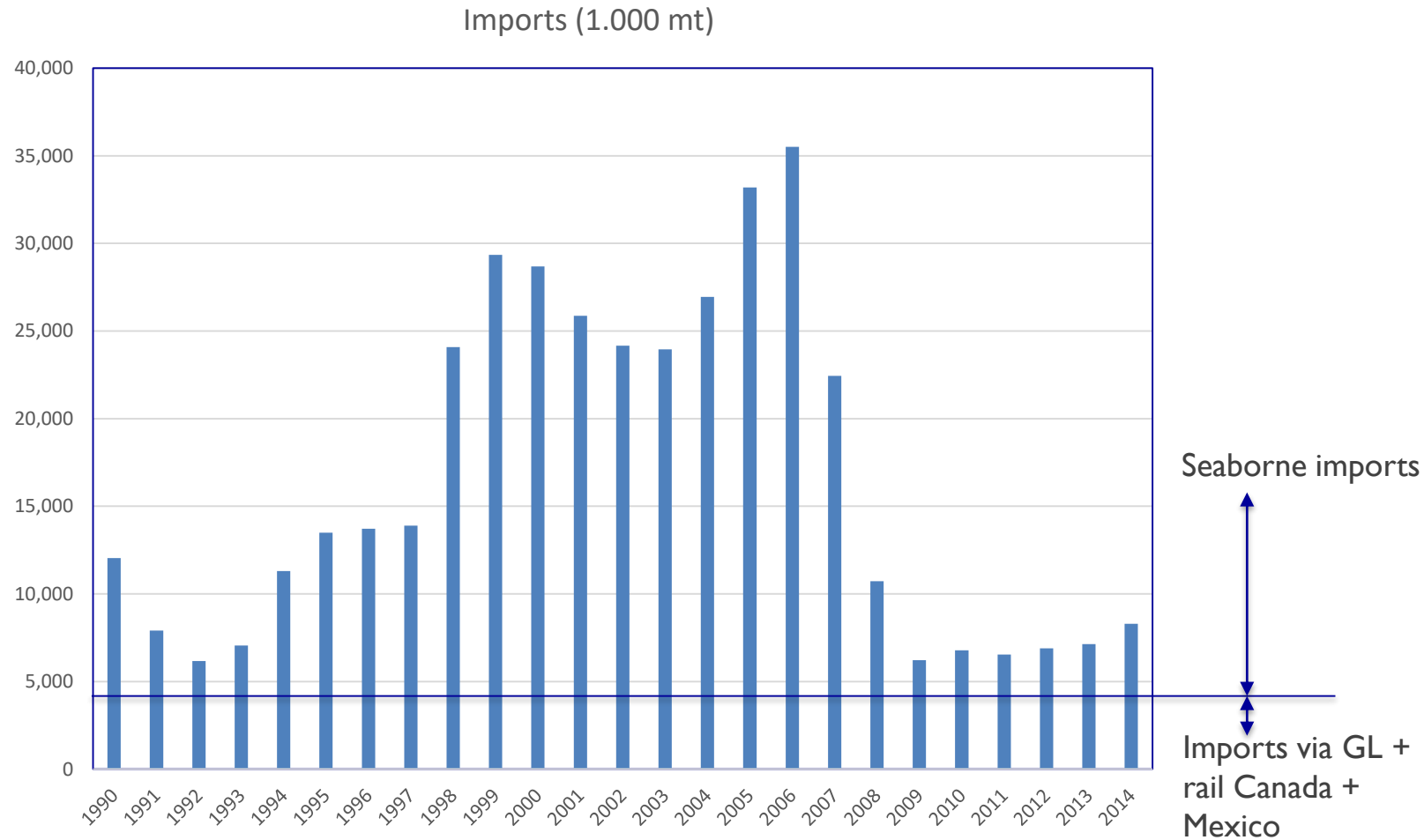


THE UNIVERSE'S PLANS FOR YOU



“And the very same applies to business plans for cement import terminals and the reality when they have been built”

Current design philosophies



Source: Global Cement Report

A bit of history of US cement imports

Current design philosophies

	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

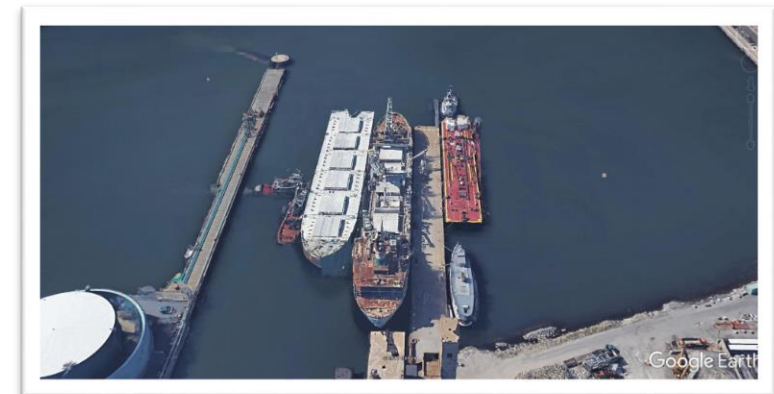
Notes:

- 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.

A bit of history on US cement imports



Current design guidelines

Given the large fluctuations of US cement imports over the years plus the changes in shipping plus the increased need to handle multiple cement products new terminal concepts need to be based on the following requirements.

1) Flexibility

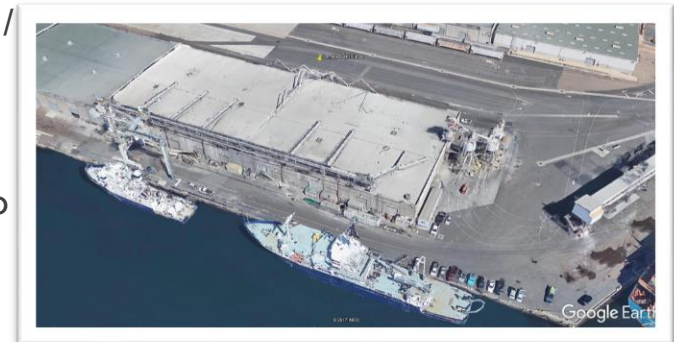
- The cement terminal should be part of a multi product facility.
- The dock should be able to handle multiple materials (i.e. the cement unloading and conveying system should not block the dock). The cement storage facility should be in a location where it does not block other activities.
- The terminals 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

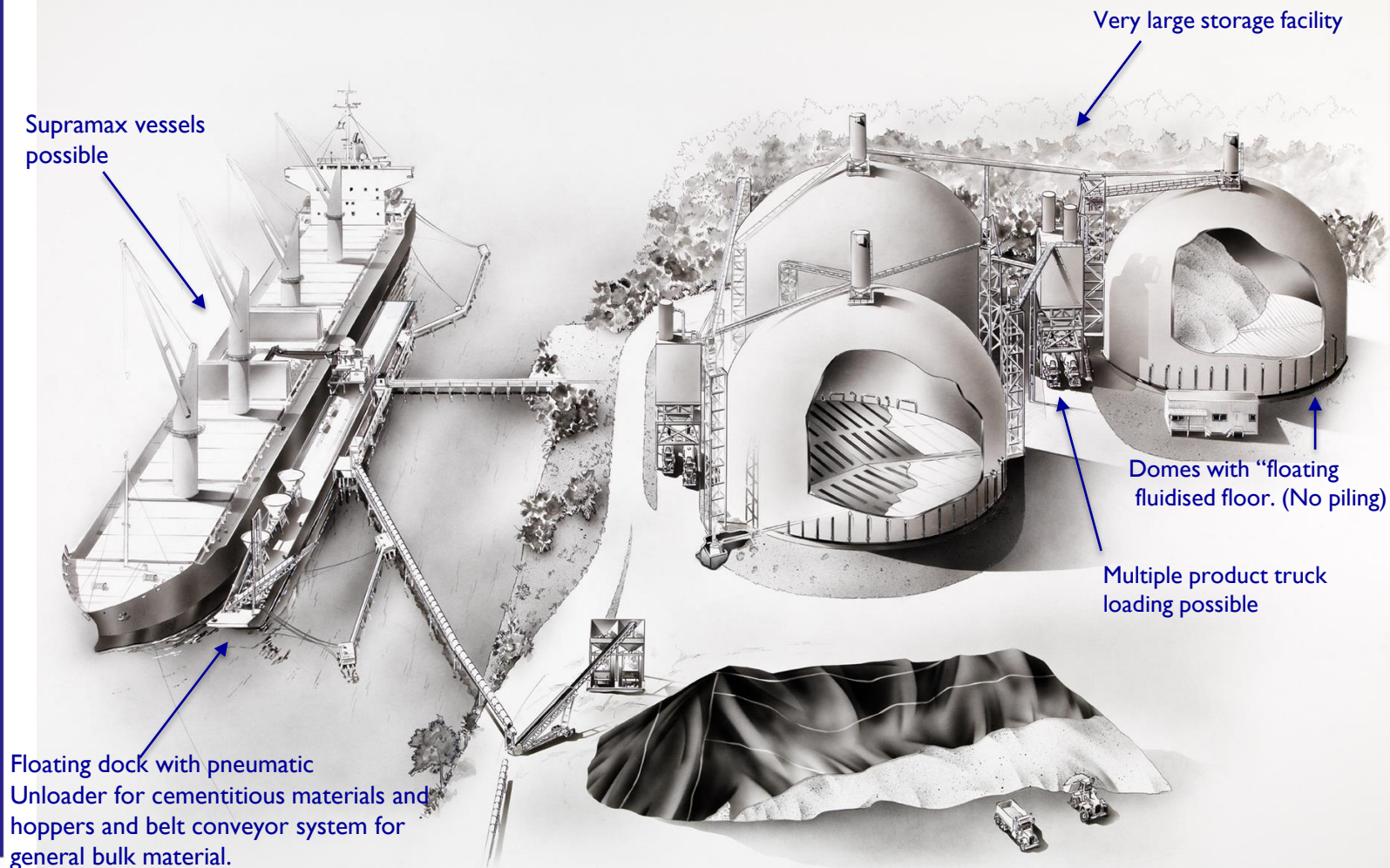
- Large but simple storage facilities (Flat storage or domes with floating fluidised floors (no piling)).
- Make optimal use of existing infrastructure.
- Simple, dock mobile, ship unloading and conveying systems.

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.



Current design guidelines



Terminal design concepts



Riverside Construction Materials, Bristol, PA

Largest cement terminal in the world
(170.000 tons storage).

Capable to handle 3 types of cement or cementitious materials as well as general bulk products.

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Current design guidelines

100,000 t flat storage
warehouse with multiple
compartments

Blending tower

Beton Provincial, Quebec

Low capital cost facility that is highly
flexible, can receive multiple cement /
cementitious material types and has
blending capability.

Capability to receive
Supramax / Ultramax vessels

Barge mounted pneumatic ship unloader

Terminal design concepts

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Current design guidelines

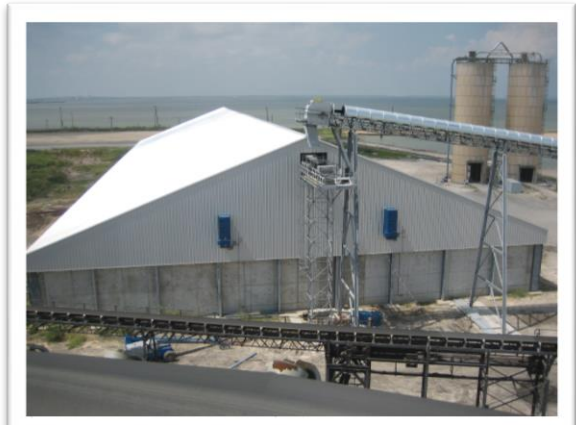
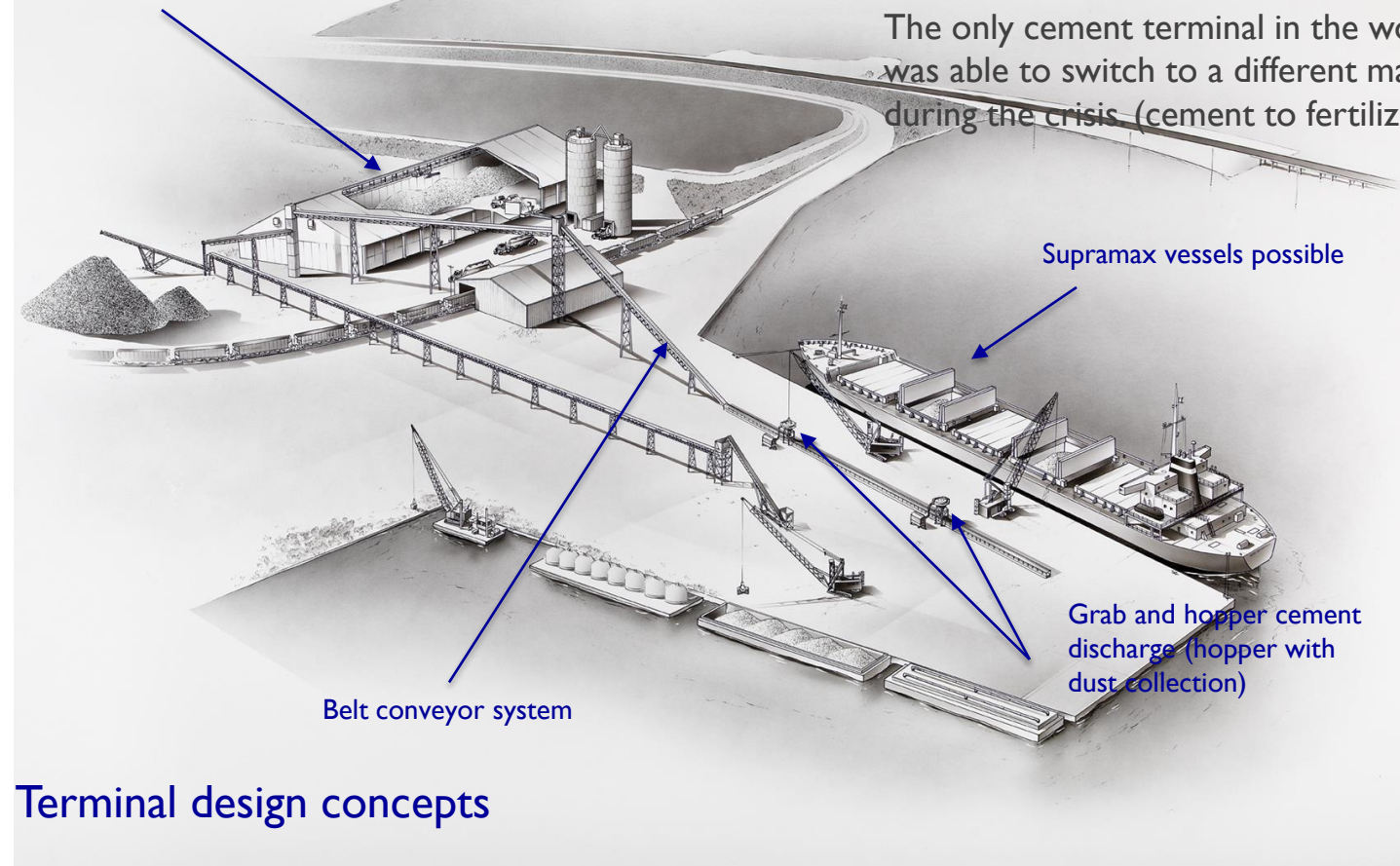
Large flat warehouse

- Can be subdivided
- Can be used for cementitious materials and general dry bulk materials

South Coast Cement, Galveston, TX

Low capital cost facility

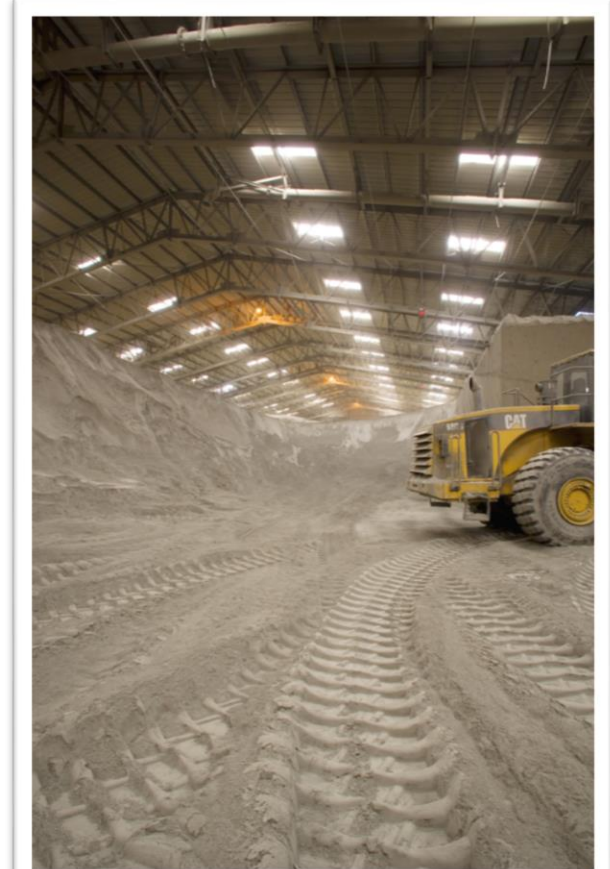
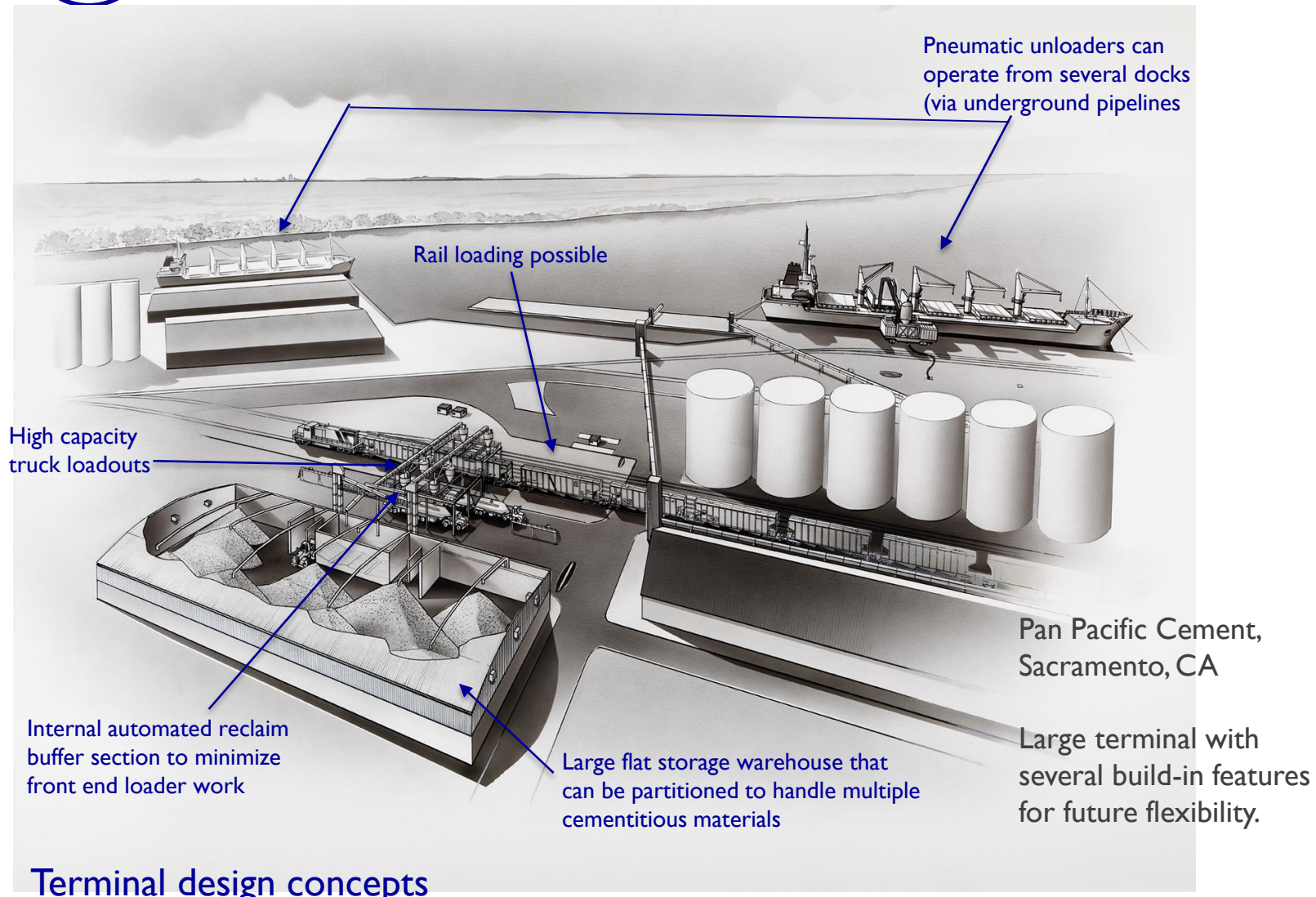
The only cement terminal in the world that was able to switch to a different material during the crisis (cement to fertilizer).



Terminal design concepts

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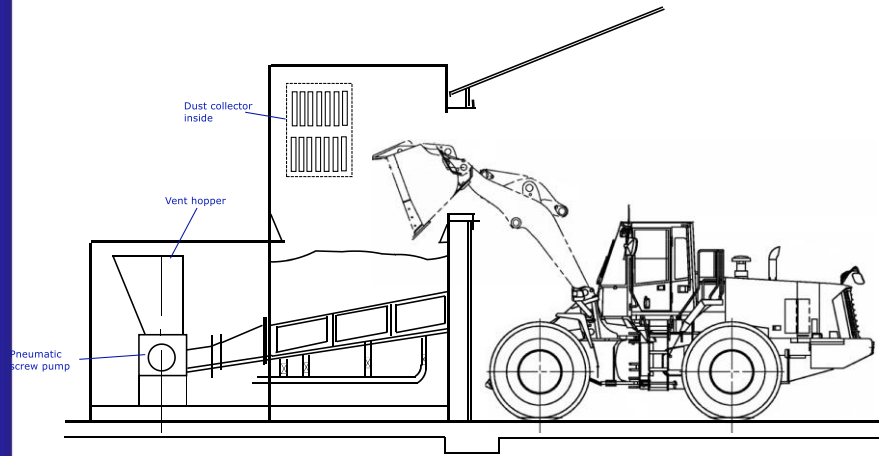
Current design guidelines



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Current design guidelines

CONTAINERIZED RECLAIM SYSTEM

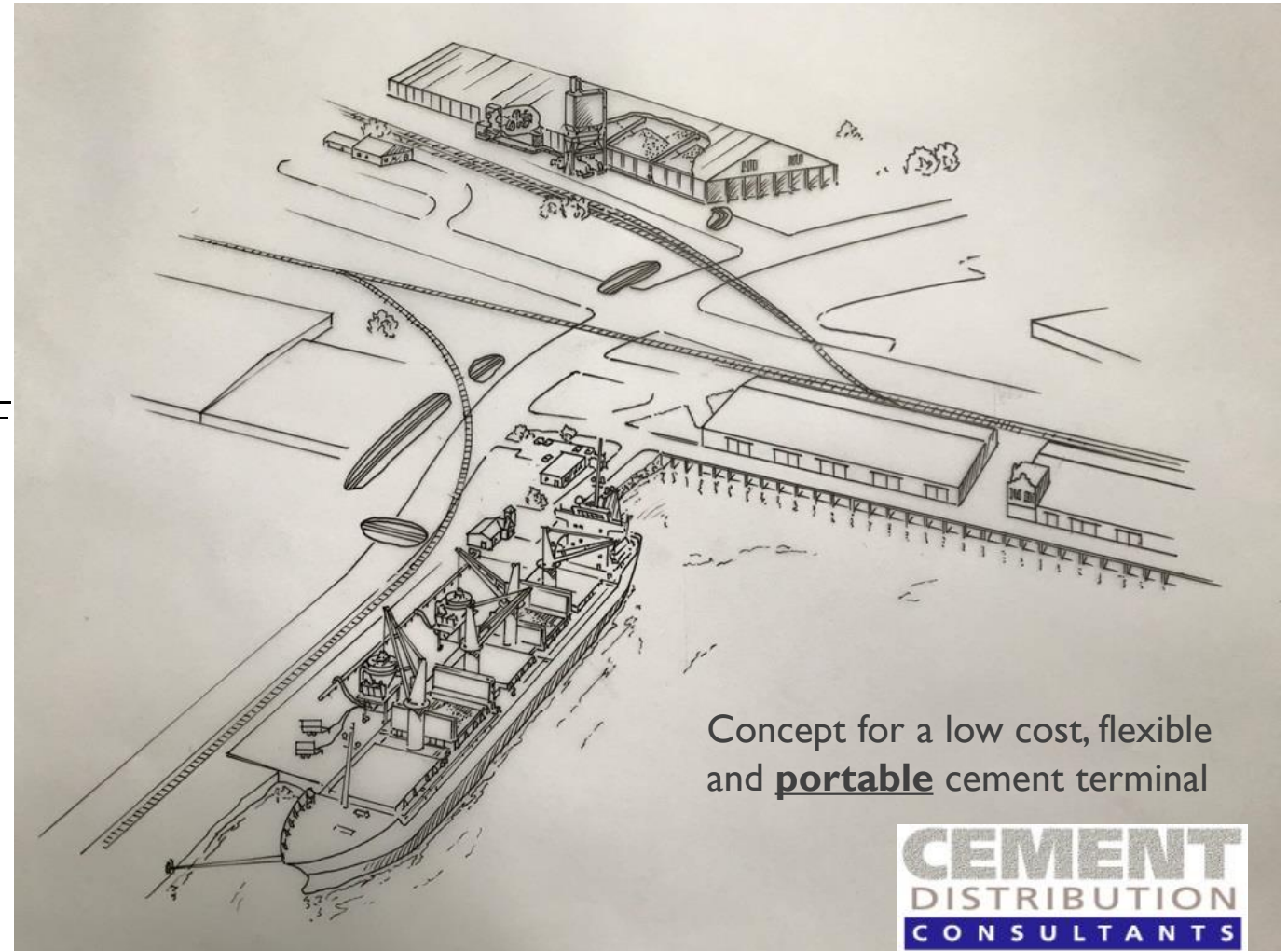


Cross section

Portable cement terminal concept

- “Modular” ship unloading hoppers with pneumatic pumps
- Modular truck loading bins and support structures which only require a concrete slab
- Existing flat storage warehouse conversion or new warehouse that can be reused for other purposes
- Containerized reclaim system equipment machine rooms and MCC
- Removable pipelines, dust collectors, auxiliary equipment
- Portable office

Terminal design concepts



Concept for a low cost, flexible and **portable** cement terminal

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Final considerations

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Although 2017 shows a lower growth of seaborne cement imports, expectation for the coming years are still quite good.

It is clear that there is a need to upgrade existing facilities or build larger new ones to meet larger ships and multiple material handling capability. So far this is hardly happening but it will need to be addressed in the coming years.

Almost all current expansion and new terminal construction projects are realised by independents (i.e. companies without a cement production base in North America) or newcomers (McInnis). This is not strange. Many terminals have started out this way. Most of the terminals have at least changed ownership once during their lifetime.

With the current projects it is clear that terminal design concepts towards flexibility, low capital cost and quick realisation time are being adapted although there is still room for improvement.

THANK YOU



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