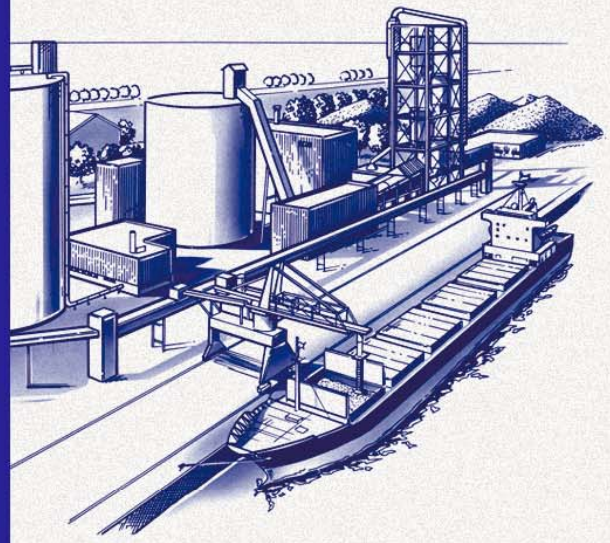
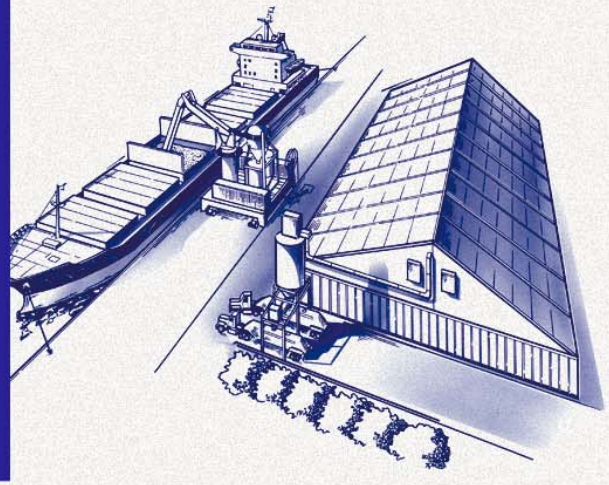




An update on US cement imports

Ad Ligthart
INTERCEM

September 21, 2022

CEMENT DISTRIBUTION CONSULTANTS

Preamble

The US is the largest importer of cement in the world. It is a very specific market which required a typical type I-II low alkalyde cement in bulk. Cement imports require dedicated facilities. The US has many of them and a lot of them are now quite old. Most terminals have been designed for Handysize bulkcarriers and typicaly have a storage capacity of about 60.000 tons and a shipunloader sized for these ships. Many of these terminals have been designed to handle one type of material only. In the past years the expectation was that terminals would adapt and expand to meet the larger Supramax vessels but this has not really happened. Now a second wave of change is coming. The US cement industry is changing from the type I-II cement (95% clinker) to type I limestone cement (80% clinker). This means US plants now could (in theory) produce 15% more cement reducing the need for imports. In addition, there is a soaring demand for cementitious products. Generally speaking, terminals ideally should be able to handle multiple types of cement as well as cementitious products. But are they???

CEMENT DISTRIBUTION CONSULTANTS

Contents of presentation

- Introduction
- A quick look at developments in global cement trade
- Key statistics of US imports
- Import destinations and terminals
- Developments in cementitious materials trade
- Final considerations

CEMENT DISTRIBUTION CONSULTANTS

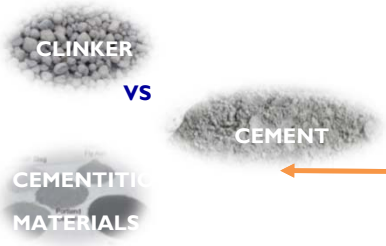
Introduction

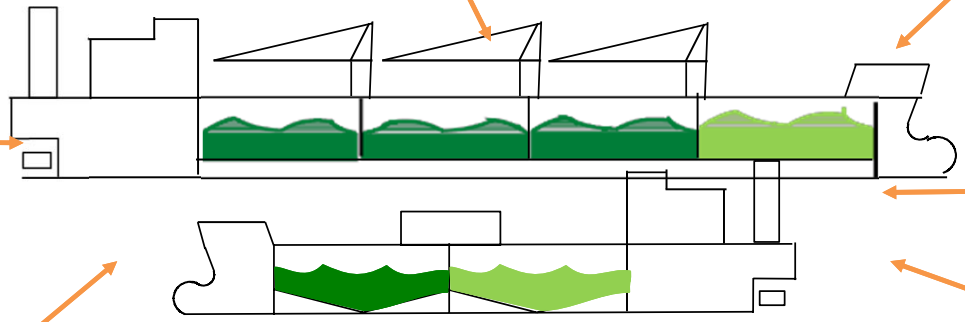
CEMENT DISTRIBUTION CONSULTANTS

Trade vs Distribution

Market statistics and developments

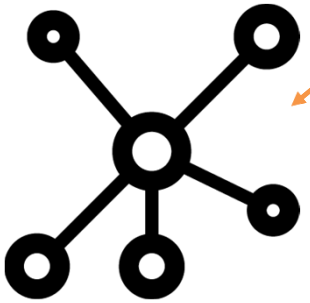
Logistics



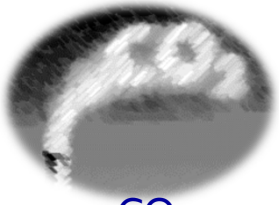


Economics

WHAT IS INVOLVED IN SEABORNE TRADE AND DISTRIBUTION OF CEMENT , CLINKER AND CEMENTITOUS MATERIALS?



Networks



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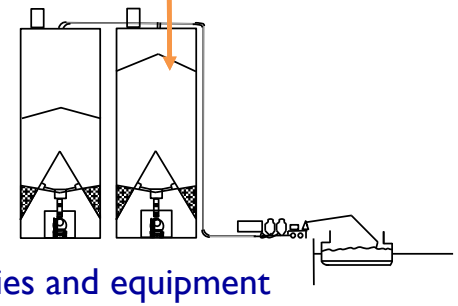


Facilities and equipment

Ships & Shipping

CEMENT DISTRIBUTION CONSULTANTS

Cement Distribution Consultants
an introduction

Facilities and Markets

- The global cement industry on Google Earth including integrated cement plants, grinding plants, coal fired powerplants, blast furnace steel plants / granulators, all related logistical facilities and ready-mix plants / concrete product plants.
- A database with general and technical information on facilities related to seaborne (and waterborne) trade and distribution.
- Significant experience in market studies.
- Significant experience in logistical competitiveness studies for new plants and terminals.

Logistics and Economics

- The ability to advise customers on every aspect of trade and distribution of cement, clinker and cementitious materials including strategical economical, logistical technical and operational aspects as well as materials sourcing, shipping, facilities, handling system, etc. etc.
- Significant experience in feasibility studies on complete logistical chains as well as individual components including logistical and economical modelling.

cementdistribution.com

A free and comprehensive website on trade and distribution of cement

Technical and Operational

- A clear vision on port and facility design that can adapt to changing trade and industry conditions.
- Consultant to two of the largest cement terminals in the world and numerous other facilities.
- Significant involvement in design and operation of self-discharging ships.
- Significant experience in realising projects and operating complete logistical chains.
- Projects realised on every continent.

CEMENT DISTRIBUTION CONSULTANTS

Cooperation Cement Distribution Consultants *and* Engineering Services Hamburg

Cement Distribution Consultants and Engineering Services Hamburg have started a cooperation in January 2022. The combination of Cement Distribution Consultants and Engineering Services Hamburg aims to provide a full range of services on every aspect of seaborne trade and distribution of cement, cementitious materials and clinker.

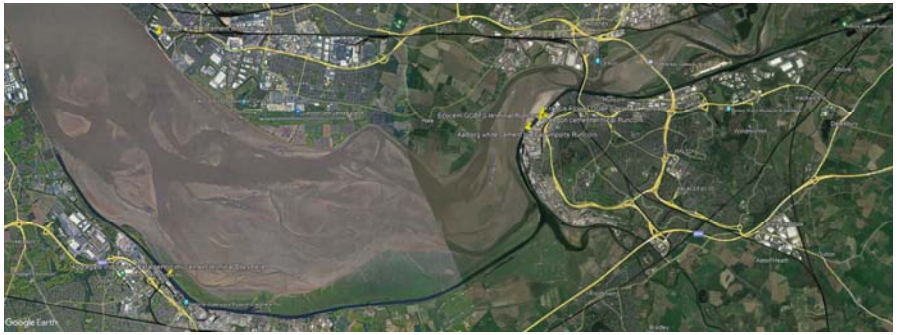
This ranges from in-depth market studies, strategical considerations, logistics and economics, feasibility studies, facility design and operations support.

Ad & Marcia Ligthart of Cement Distribution Consultants and Mario Rämmele of Engineering Services Hamburg represent a combined 90 years of experience in this field covering the largest terminals in the world, mechanical and pneumatic ship loaders and unloaders, all types of conveying systems, self-discharging cement carriers, any type of storage facility and so on. All this based not just on technology but on the logistics, economics and strategical aspects behind it. We are fully independent and value the trust given to us by our customers.

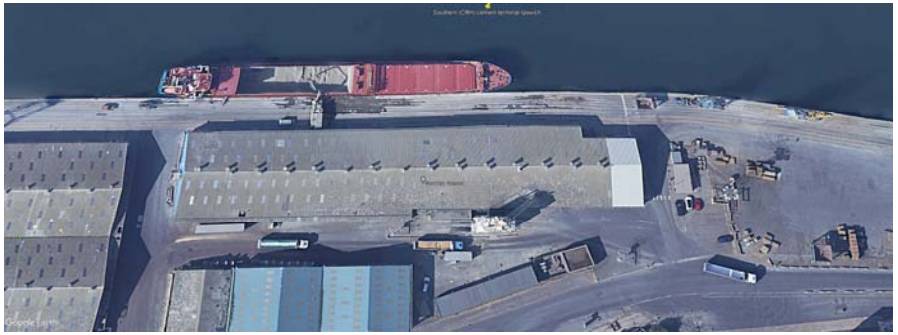
Global database of cement facilities on google Earth

GE global

Regional



Local

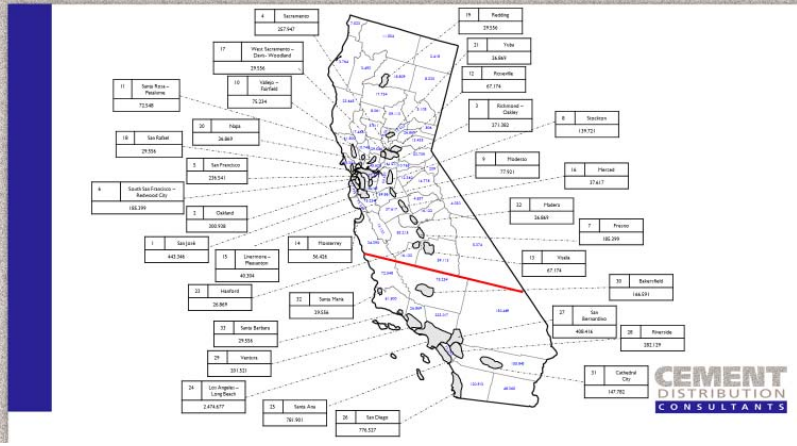


Detailed view

CEMENT DISTRIBUTION CONSULTANTS

Market studies based on statistics in combination with distribution capabilities

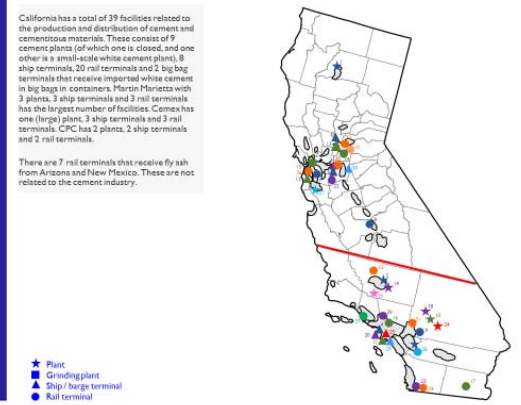
California cement cement consumption by metropolitan area and remaining by county



California cement plants and terminals

California has a total of 39 facilities related to the production and distribution of cement and cementitous materials. These consist of 9 cement plants (of which one is closed, and one other is a small-scale white cement plant), 8 ship terminals, 20 rail terminals and 2 big bag terminals that receive imported white cement in big bags in containers. Martin Marietta with 3 plants, 3 ship terminals and 3 rail terminals has the largest number of facilities. Cemex has one (large) plant, 3 ship terminals and 3 rail terminals. CPC has 2 plants, 2 ship terminals and 2 rail terminals.

There are 7 rail terminals that receive fly ash from Arizona and New Mexico. These are not related to the cement industry.



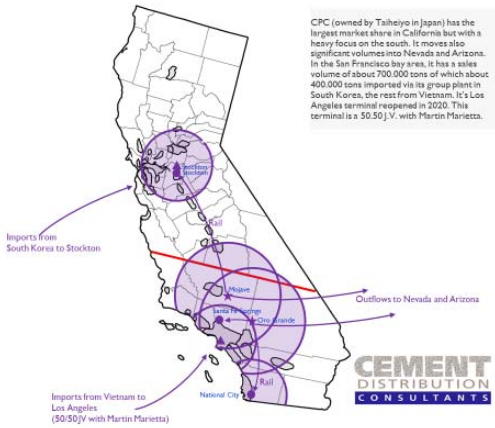
CPC production and distribution network

2020 Production / imports / inflows / outflows California overall	
Mojave plant	1,411,971
Oro Grande plant	2,003,233
Los Angeles import terminal (50%)	27,000
Stockton import terminal	400,000
Outflows to Nevada	650,000
Outflows to Arizona	300,000
Total CPC supply	2,892,204
Total California consumption	10,476,940
Marketshare CPC	27,6%

North California	
Stockton import terminal	400,000
Inflow to Stockton by rail	300,000
Total CPC supply	700,000
Total North California consumption	4,170,678
Marketshare CPC	16,8%

South California	
Mojave plant	1,411,971
Oro Grande plant	2,003,233
Los Angeles import terminal 50%	27,000
Outflows to Nevada	650,000
Outflows to Arizona	300,000
Total CPC supply	2,492,204
Total South California consumption	6,306,262
Marketshare CPC	39,5%

Area within 100 miles of a cement plant or 65 miles of a terminal



CPC (owned by Taiheiyo in Japan) has the largest market share in California but with a heavy focus on the south. It moves also significant volumes into Nevada and Arizona. In the San Francisco bay area, it has a sales volume of about 700.000 tons of which about 400.000 tons imported via its group plant in South Korea, the rest from Vietnam. It's Los Angeles terminal reopened in 2020. This terminal is a 50.50 J.V. with Martin Marietta.

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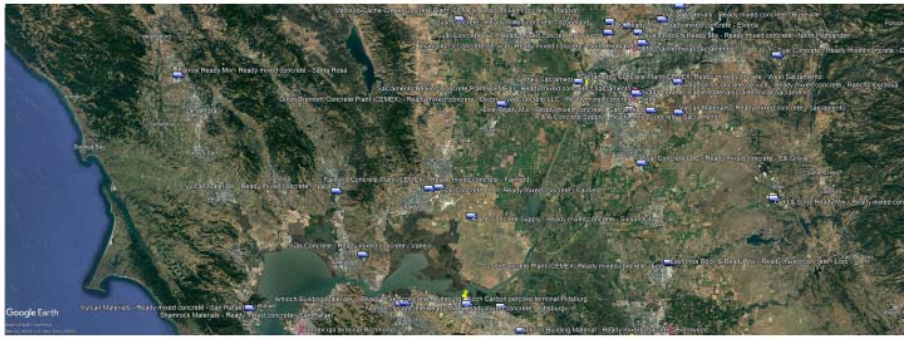
Ready mixed plant overview



CEMENT
DISTRIBUTION
CONSULTANTS

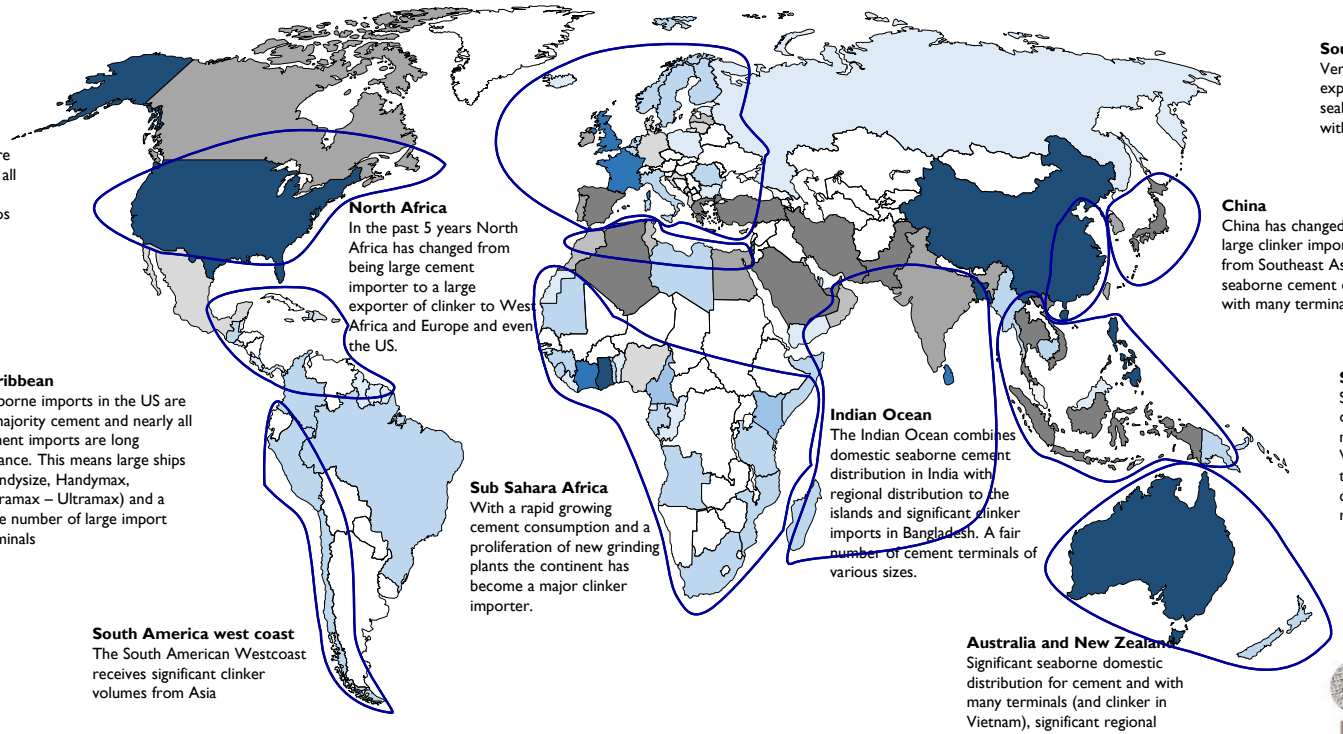
A quick look at developments in global cement trade

CEMENT DISTRIBUTION CONSULTANTS

Characteristics of global cement and clinker trade

Europe
Europe has extensive regional trade and regional and domestic distribution of cement n coastal vessels serving several hundred small terminals. Clinker imports in Europe have started a few years ago and are now rapidly growing. Turkey has developed into a major export country whilst exports from Europe have diminished.

Seaborne imports / exports
- Imports > 5 million
- Imports > 2 millon
- Imports > 0,5 million
- Imports > 0,1 million
- Balance
- Exports > 0,1 million
- Exports > 0,5 million
- Exports > 2 million
- Exports > 5 million



North America
Seaborne imports in the US are in majority cement and nearly all cement imports are long distance. This means large ships (Handysize, Handymax, Supramax – Ultramax) and a large number of large import terminals

North Africa
In the past 5 years North Africa has changed from being large cement importer to a large exporter of clinker to West Africa and Europe and even the US.

Caribbean
Seaborne imports in the US are in majority cement and nearly all cement imports are long distance. This means large ships (Handysize, Handymax, Supramax – Ultramax) and a large number of large import terminals

Sub Sahara Africa
With a rapid growing cement consumption and a proliferation of new grinding plants the continent has become a major clinker importer.

South America west coast
The South American Westcoast receives significant clinker volumes from Asia

Indian Ocean
The Indian Ocean combines domestic seaborne cement distribution in India with regional distribution to the islands and significant clinker imports in Bangladesh. A fair number of cement terminals of various sizes.

South Korea, Japan, Taiwan
Very large cement and clinker export base. Very significant seaborne domestic distribution with hundreds of terminals.

China
China has changed to a very large clinker importer mostly from Southeast Asia. Significant seaborne cement distribution with many terminals

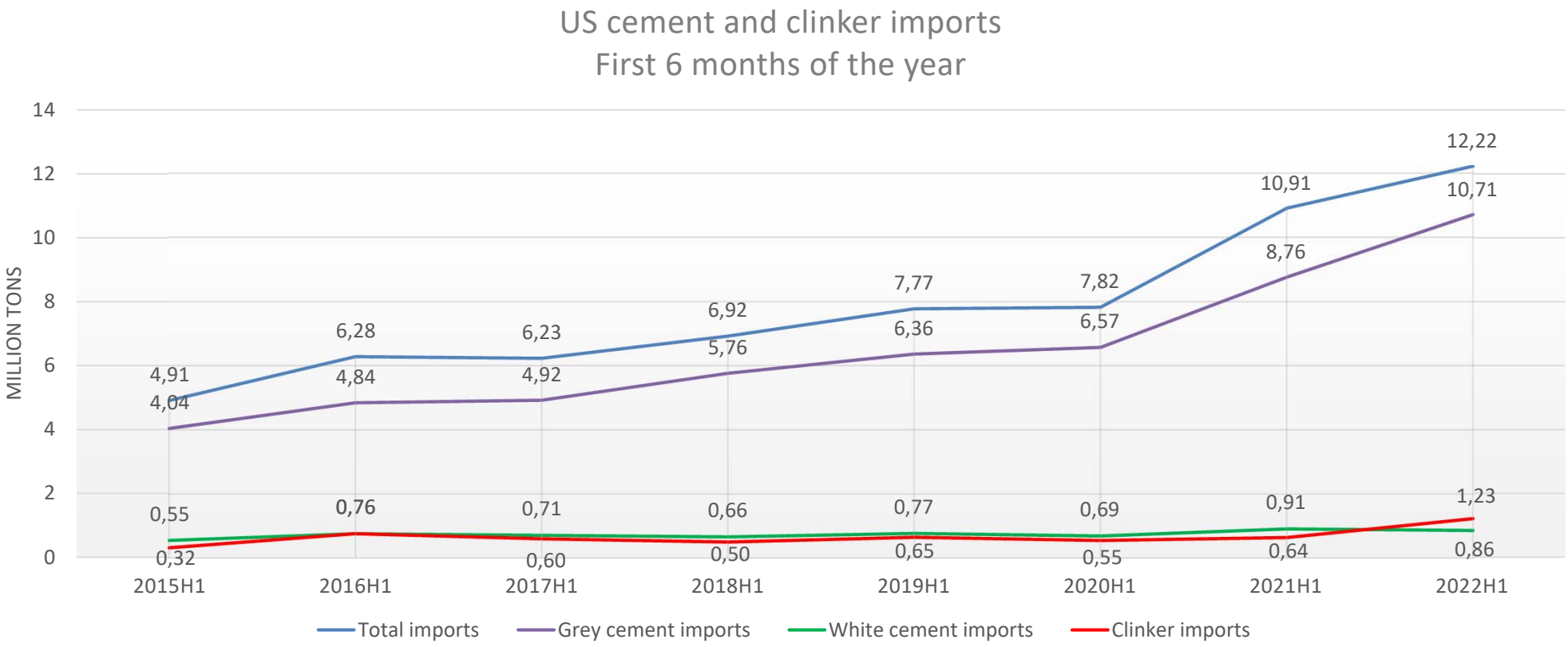
Southeast Asia
Significant seaborne domestic distribution of cement and with many terminals (and clinker in Vietnam), significant regional trade and significant exports of cement and clinker to other regions.

Australia and New Zealand
Significant seaborne domestic distribution for cement and with many terminals (and clinker in Vietnam), significant regional trade and significant exports of cement and clinker to other regions.

CEMENT DISTRIBUTION CONSULTANTS

Key statistics of US imports

CEMENT DISTRIBUTION CONSULTANTS



CEMENT DISTRIBUTION CONSULTANTS

Import statistics US cement + Clinker 2022H1

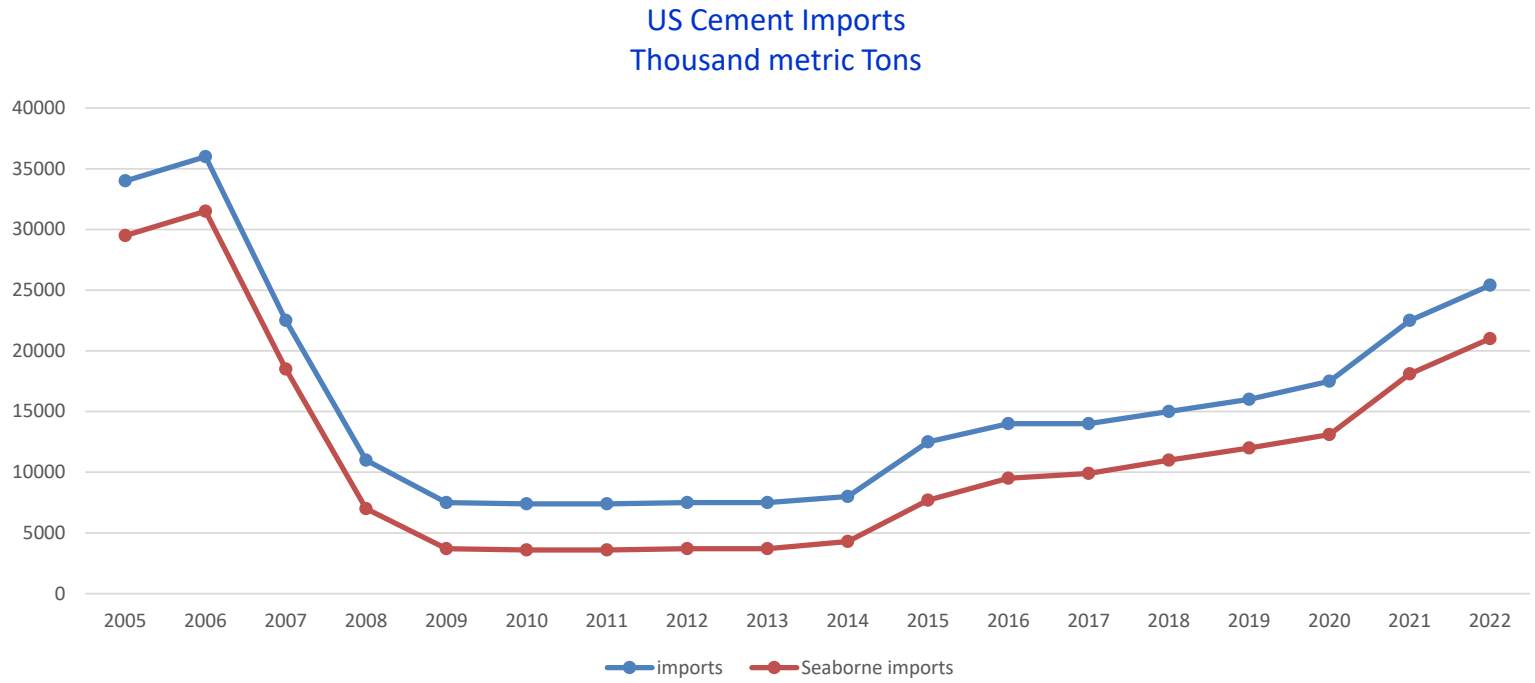
	2022H1
Imports from Mexico by rail	738.573
Imports from Mexico by sea	542.613
Total imports from Mexico	**1.281.186**
Imports from Canada by rail	450.274
Imports from Canada via Great Lakes	897.129
Imports from Canada by sea	840.087
Total imports from Canada	**2.187.490**
Seaborne imports from EuroMed and Middle East	6.562491
Seaborne imports from Asia	1.824.640
Seaborne imports from South America	368.066
Total cement and clinker imports	**12.283.873**
Total seaborne cement and clinker imports	**10.197.897**

Source: USGS / Cement Distribution Consultants All volumes in metric tons

Despite all global uncertainty and a lack of visibility US cement and clinker exports look set to reach about 25,5 million tons for FY 2022. About 21 million tons of this will be seaborne imports.

CEMENT DISTRIBUTION CONSULTANTS

An overview of US imports



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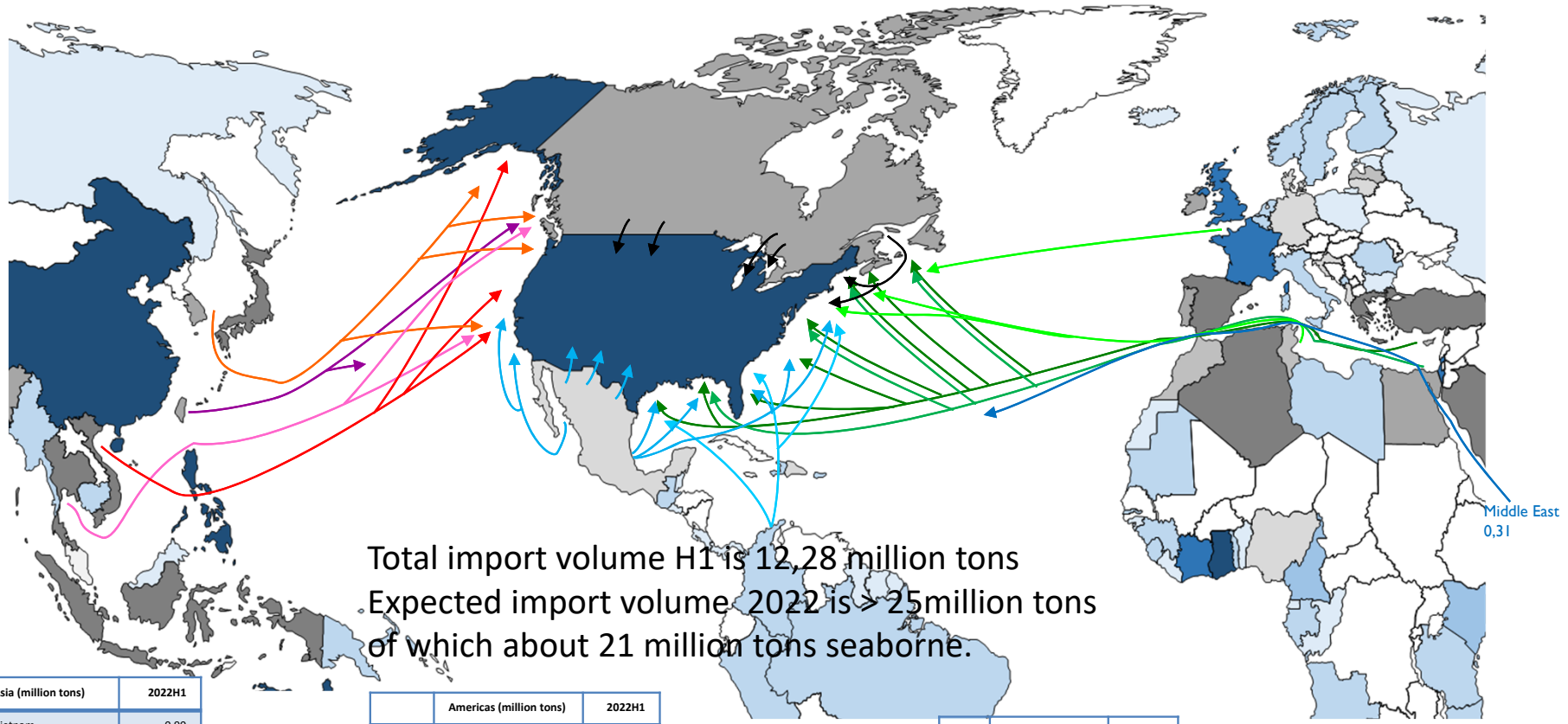
CEMENT DISTRIBUTION CONSULTANTS

US seaborne cement and clinker imports by source 2022H1



Total import volume H1 is 12,28 million tons
Expected import volume 2022 is > 25million tons
of which about 21 million tons seaborne.

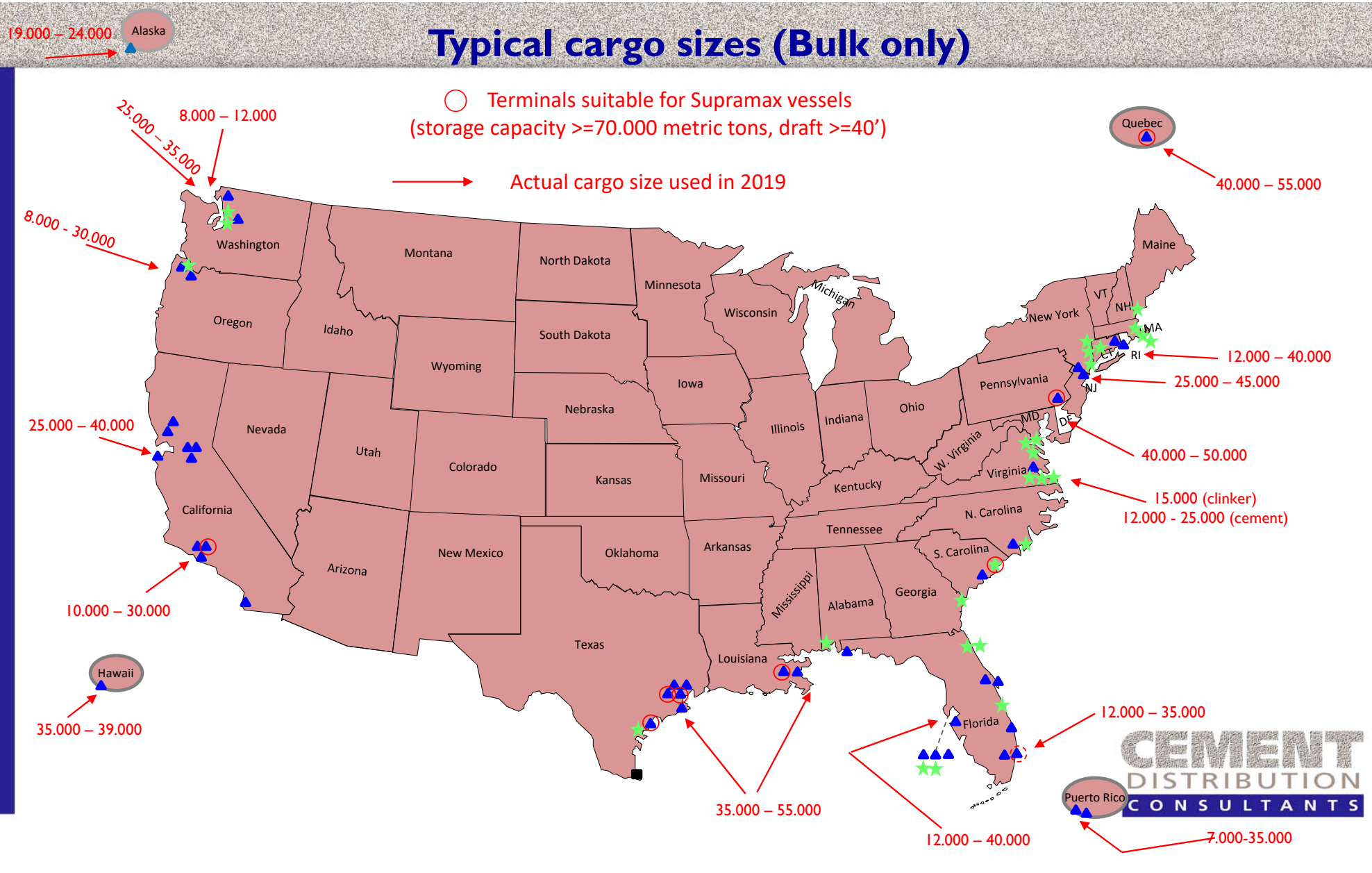
	Asia (million tons)	2022H1
	Vietnam	0,90
	South Korea	0,48
	Thailand	0,22
	Taiwan	0,22
	Total Asia	**1,82**

	Americas (million tons)	2022H1
	Canada	2,19
	Mexico	1,28
	Colombia	0,36
	Total	**3,,83**

	Europe / Med. (million tons)	2022H1
	Turkey	4,66
	Greece	1,20
	Other Countries	0,70
	Total	**6,56**

CEMENT DISTRIBUTION CONSULTANTS

Typical cargo sizes (Bulk only)

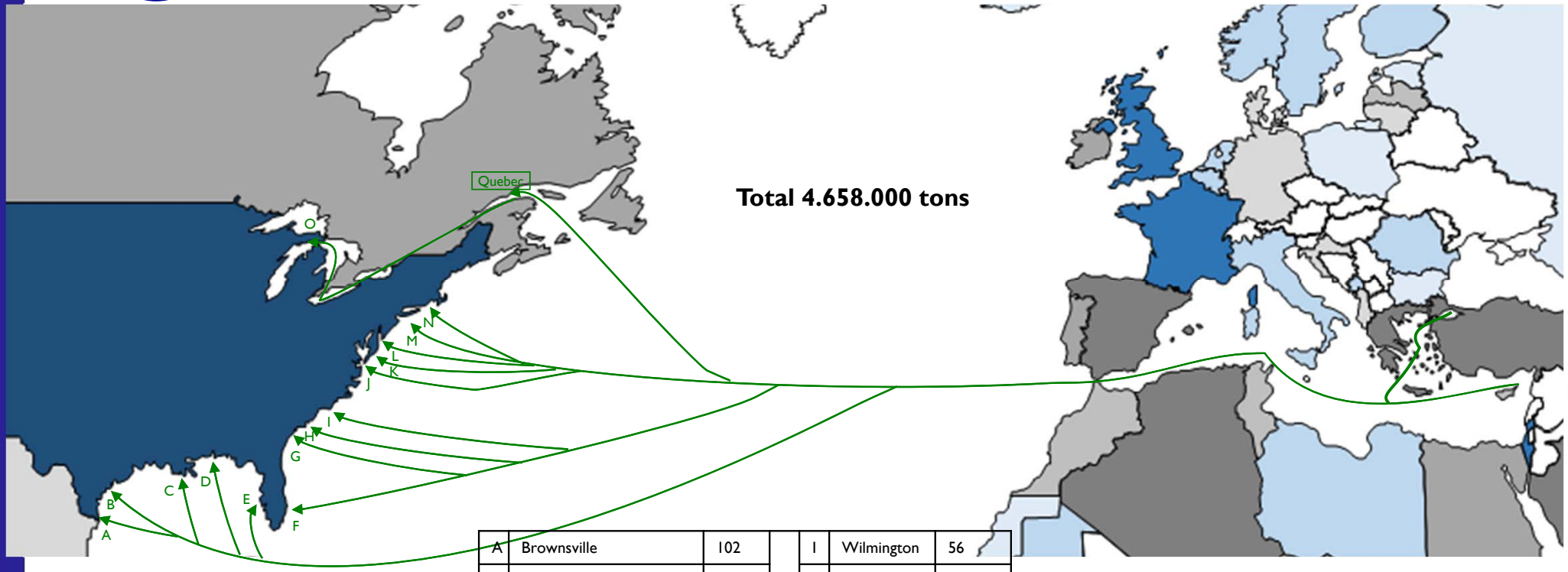


CEMENT DISTRIBUTION CONSULTANTS

Import flows and terminals

CEMENT DISTRIBUTION CONSULTANTS

US cement and clinker imports from Turkey 2022H1



Total 4.658.000 tons

Seaborne imports / exports

- Imports > 5 million
- Imports > 2 millon
- Imports > 0,5 million
- Imports > 0,1 million
- Balance
- Exports > 0,1 million
- Exports > 0,5 million
- Exports > 2 million
- Exports > 5 million

A	Brownsville	102		I	Wilmington	56
B	Houston/ Corpus Christi	2.085		J	Norfolk	10
C	New Orleans	552		K	Baltimore	33
D	Mobile	198		L	Philadelphia	111
E	Tampa	265		M	New York	153
F	Miami	514		N	Providence	130
G	Savannah	362		O	Minneapolis	20
H	Charleston	66		*Figures in 1.000 tons*		

CEMENT DISTRIBUTION CONSULTANTS

Houston terminals

The import volume in the Houston customs district looks set to exceed 5 million tons in 2022 with about 80% sourced from Turkey. This volume is largely handled by 6 terminals of which only one is really designed to handle multiple products

Cemex

BBM (Sesco)

Houston cement East

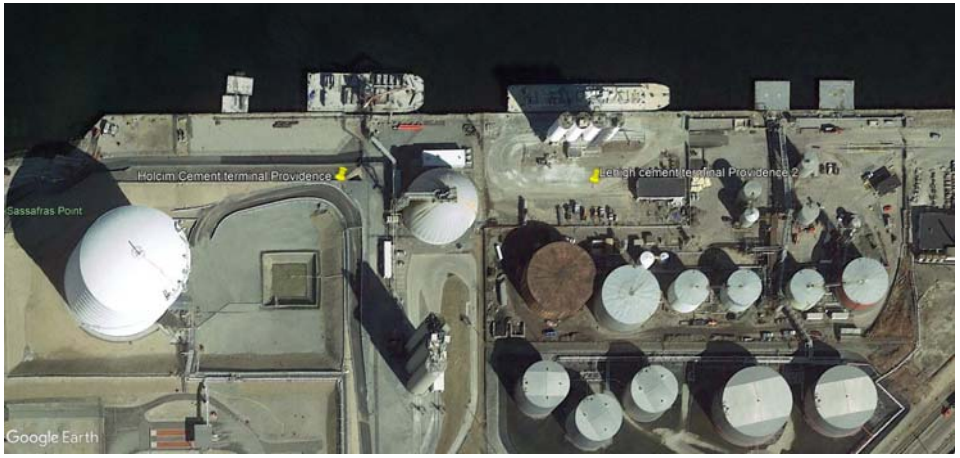
South Texas Cement (Corpus Christi

Houston cement West

The Argos Houston terminal is shown in a later slide

CEMENT DISTRIBUTION CONSULTANTS

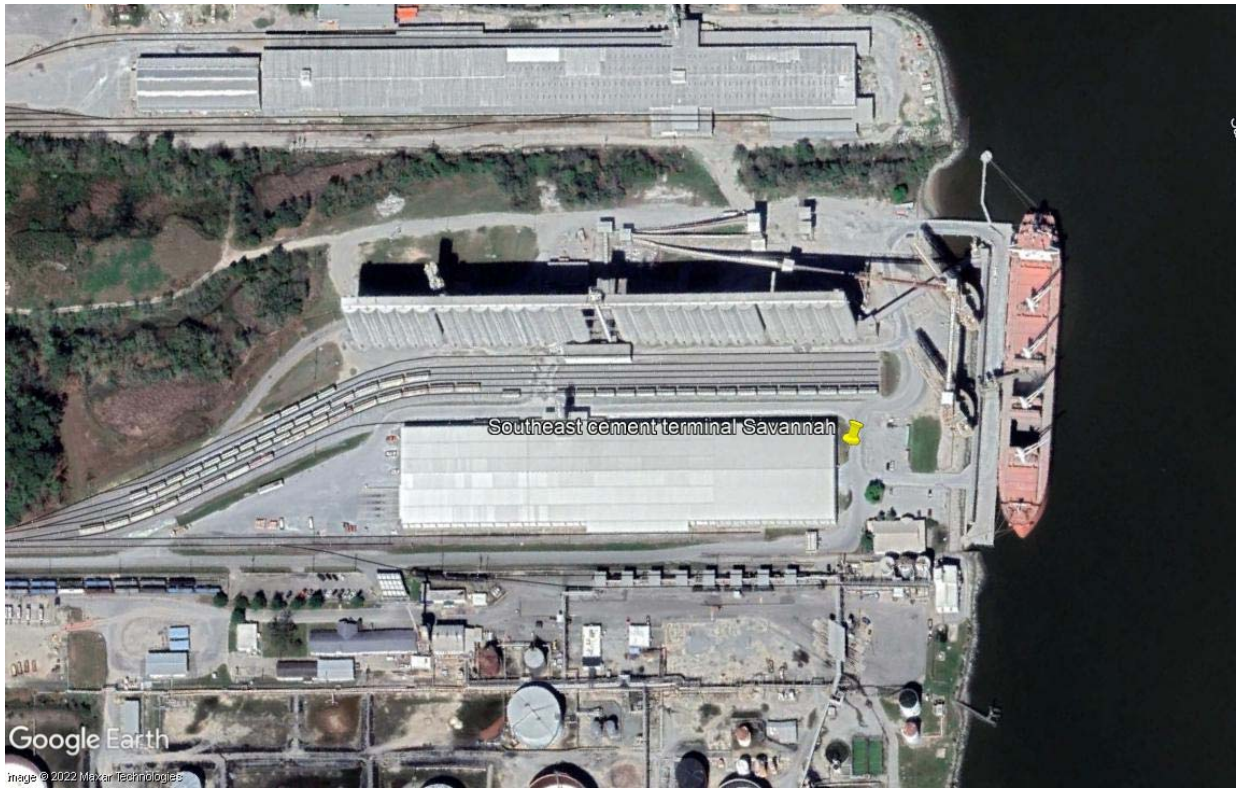
Providence terminals



In contrast to Houston is the port of Providence which will have an import volume of about 0,6 million tons in 2022. It has 3 import terminals (and one domestic one). So far about 40% of the cement is sourced from Turkey. The import terminals are basically designed to handle one product only.

CEMENT DISTRIBUTION CONSULTANTS

Port of Savannah

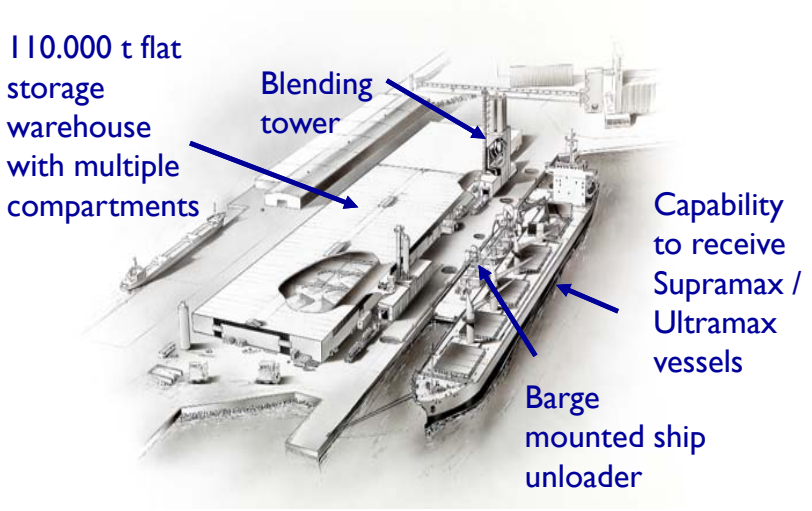


Southeast Cement (Colonial terminal)

The Port of Savannah received over 460.000 tons of cement in 2022H1. Of this volume about 100.000 tons came from Colombia and went to the Argos terminal. About 360.000 tons came from Turkey with most of this going to the Southeast Cement at the Colonial Terminal. The remainer of the Turkish cement was imported in big bags by Giant Cement. Southeast cement is expected to increase its throughput significantly

CEMENT DISTRIBUTION CONSULTANTS

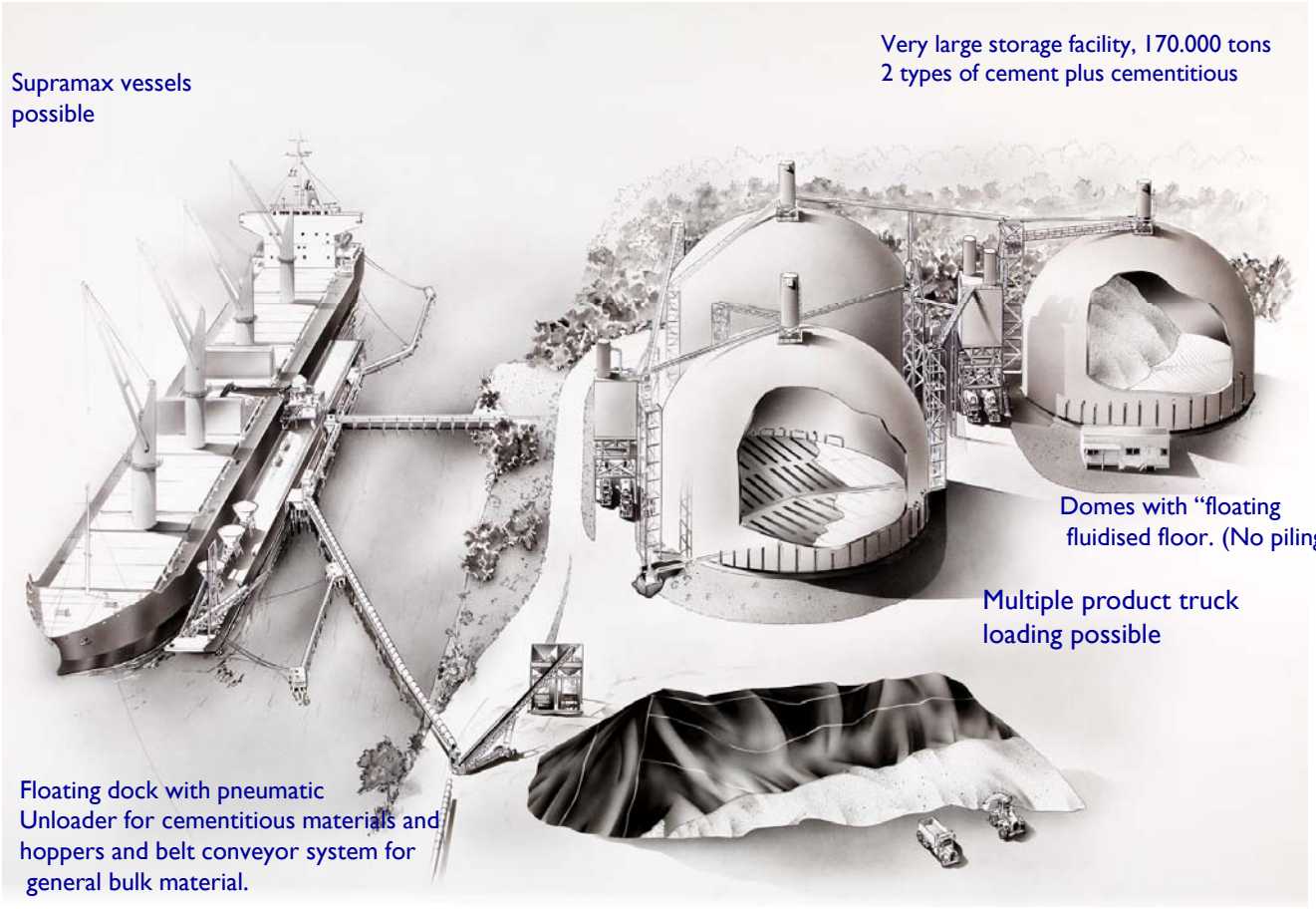
Beton Provincial Quebec



The Beton Provincial Terminal in Quebec has a multicompartment flat storage warehouse of 110.000 tons on berth 27 and a 70.000 tons dome on berth 51. both are served by a floating shipunloader. The facilities combined have blending capability and dispatch by truck and railcar. The terminal cand handle 5-6 different materials and with that is exceptionally flexible.

CEMENT DISTRIBUTION CONSULTANTS

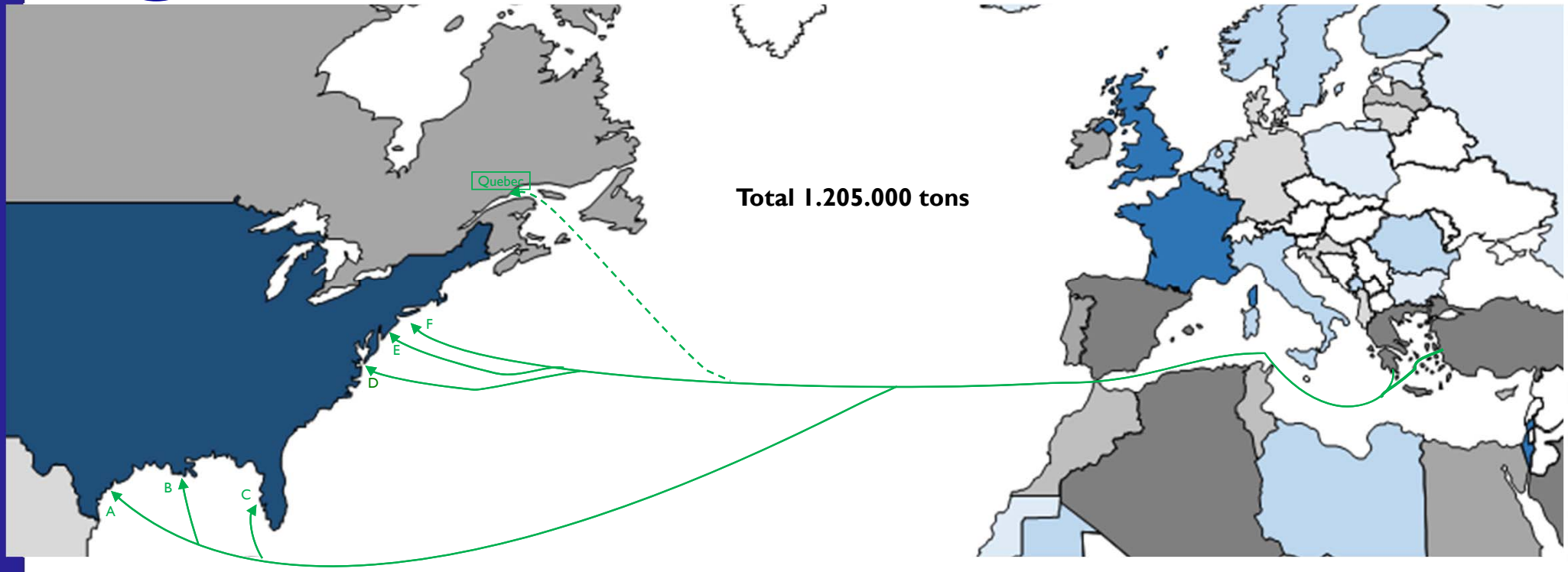
Silvi Materials Bristol, PA



The Silvi Materials terminal close to Philadelphia is another example of a terminal with a very large storage capacity and flexibility in use

CEMENT DISTRIBUTION CONSULTANTS

US cement imports from Greece 2022H1



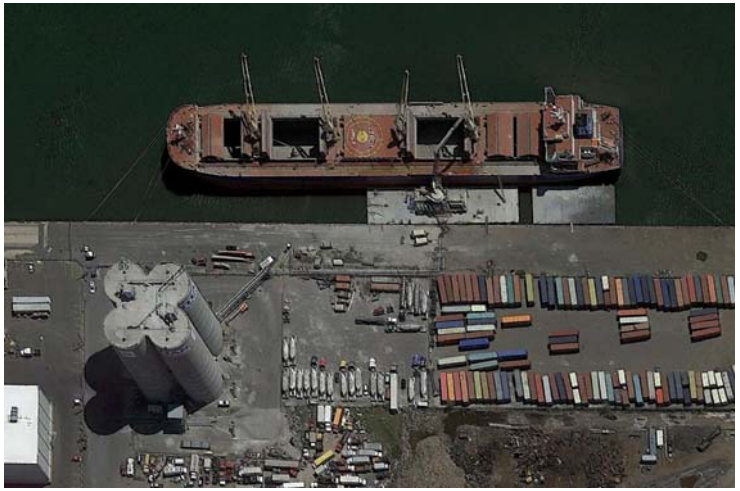
Seaborne imports / exports

- Imports > 5 million
- Imports > 2 millon
- Imports > 0,5 million
- Imports > 0,1 million
- Balance
- Exports > 0,1 million
- Exports > 0,5 million
- Exports > 2 million
- Exports > 5 million

A	Houston	167	D	Philadelphia	45
B	New Orleans	50	E	New York	409
C	Tampa	316	*Figures in 1.000 tons*		
D	Norfolk	219			

CEMENT DISTRIBUTION CONSULTANTS

Titan terminals



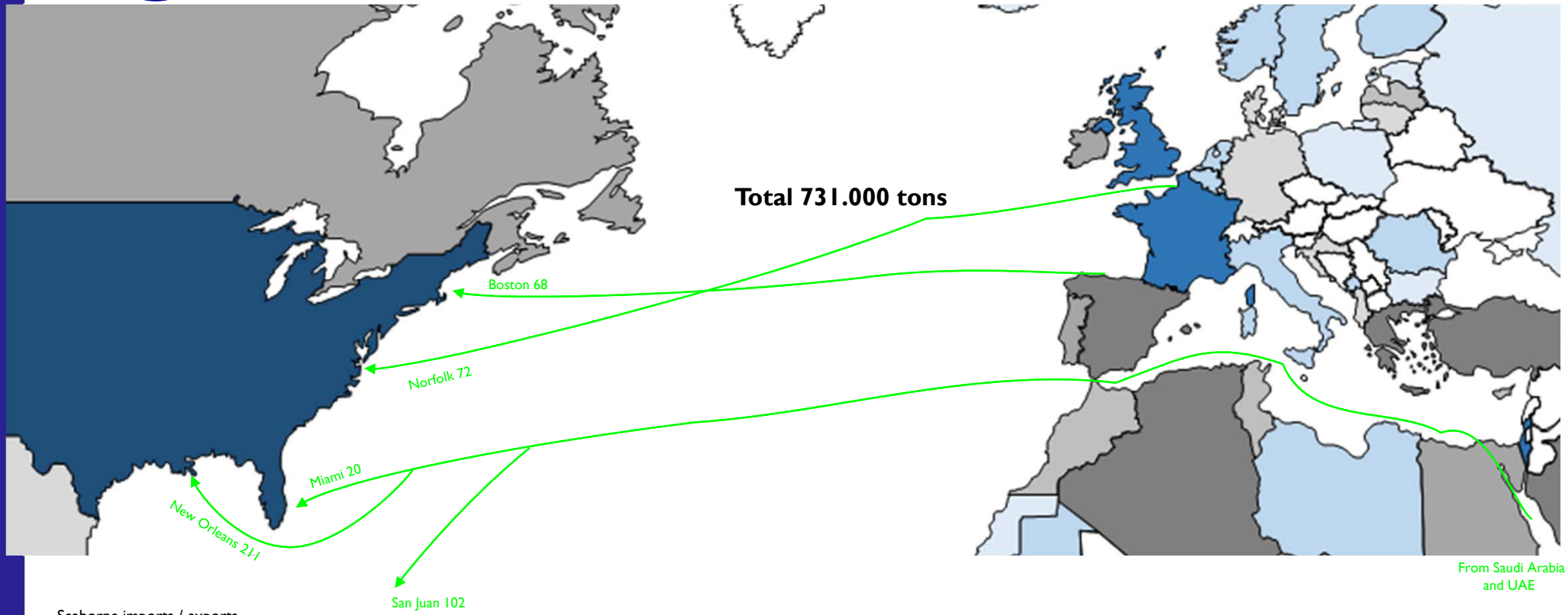
Titan
Chesapeake

Titan
Newark
Titan Tampa

The US import volume from Greece will be about 2,5 million tons in 2022. Almost all of this goes to terminals which are owned by the same company as the exporter. Titan is expected to ship about 2 million tons to its own three terminals in the US. These are all designed for one product only.

CEMENT DISTRIBUTION CONSULTANTS

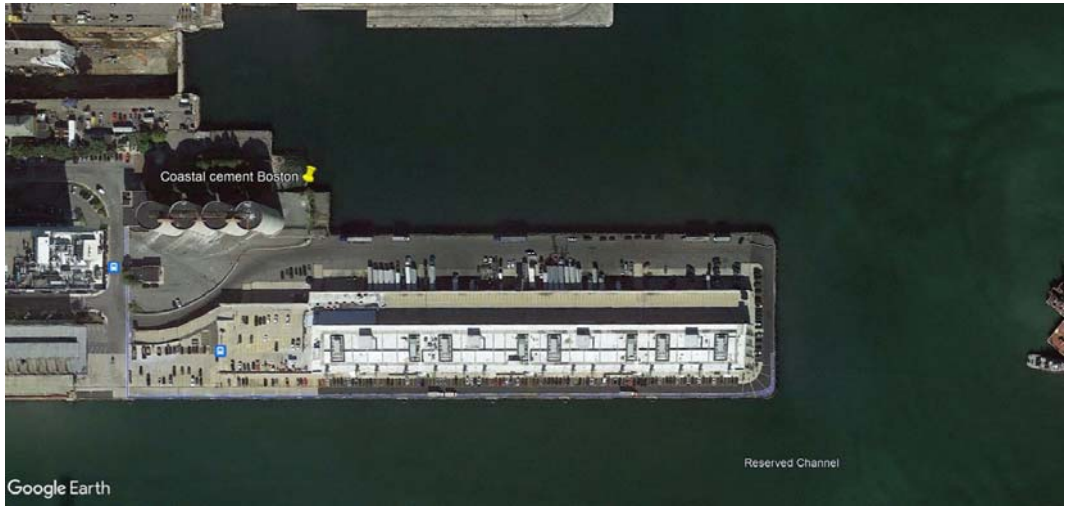
US cement and clinker imports from Europe / Mediterranean and Middle East 2022H1 (other countries)



Imports from the rest of Europe have dropped dramatically and now are only specialty cements and clinkers (with one exception). North African countries exports are increasing but the logistics for bulk cement supplies are still limited. The Middle East countries are now gearing up as well and supplied over 300.000 tons of cement and clinker.

CEMENT DISTRIBUTION CONSULTANTS

Dragon cement's new ship unloader in Boston



Apart from Greece there are no significant exports from Europe to the US any more apart from specialty products. There is one exception however. Giant Cement has been using its Boston terminal to Import cement from Spain. In 2022H1 it received about 80.000 tons by selfdischarging cementcarrier but it recently commissioned a floating shipunloader to unload handysize bulkcarriers. Storage capacity at the terminal is less than 40.000 tons however!

CEMENT DISTRIBUTION CONSULTANTS

US cement imports from Asia 2022H1

Vietnam

Anchorage	28
Seattle	168
Portland	7
San Francisco	582
Los Angeles	120

South Korea

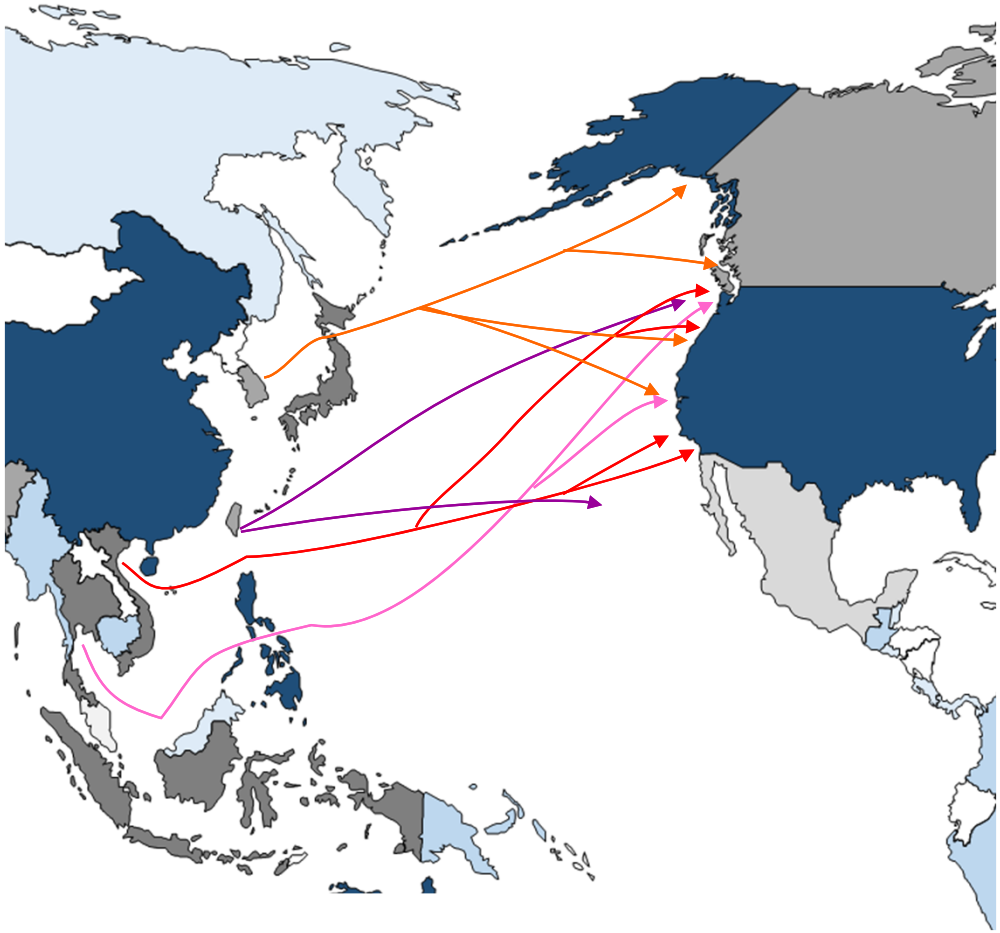
Anchorage	47
Seattle	48
Portland	325
San Francisco	61

Thailand

Seattle	27
San Francisco	191

Taiwan

Seattle	107
Honolulu	112



Cement imports from Asia totalled 1,82 million tons in 2022H1 and look set to reach about 4 million ton over the full year. About 50% is supplied by Vietnam.

CEMENT DISTRIBUTION CONSULTANTS

San Francisco Bay area (Port of Stockton)

The San Francisco Bay area imported 1,1 million tons in 2022H1. Of this about 0,27 million came from Mexico and the remainder from Asia. There are 6 terminals in the Bay area with 3 of them in the Port of Stockton. The Martin Marietta 2 terminal is dedicated to GGBFS and goes back to the 1960's. The Martin Marietta 1 terminal is a floating terminal dating back to the 1980's.

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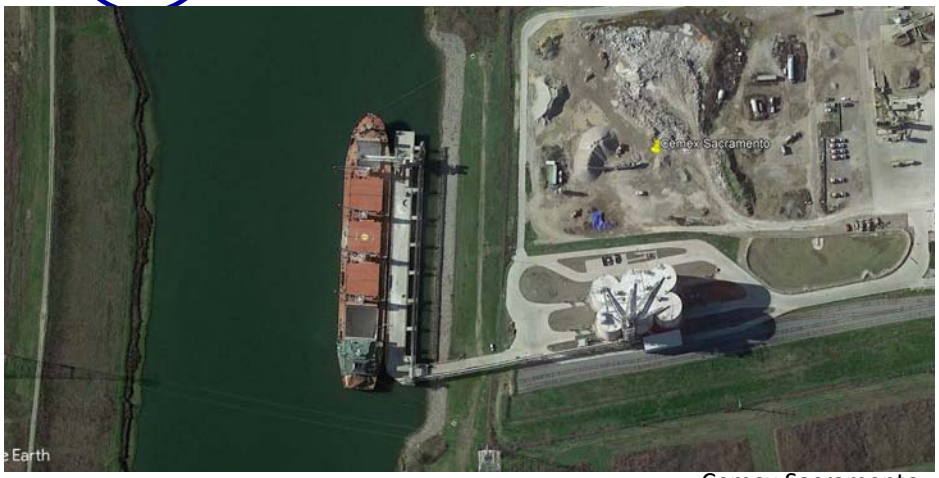
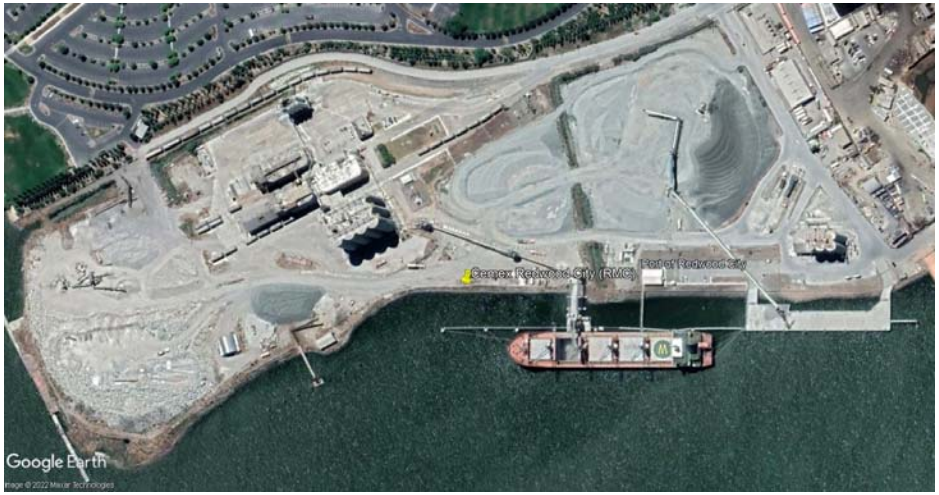
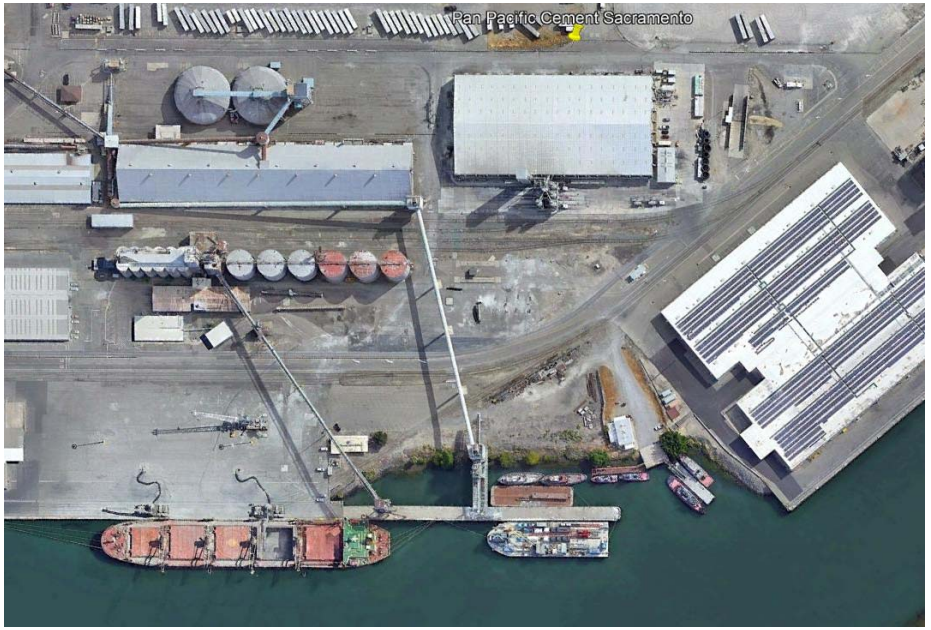
San Francisco Bay area Sacramento and Redwood City



Cemex Sacramento



Cemex Redwood city



Pan Pacific, Sacramento

The other 3 terminals are the Cemex terminals in Redwood City and Sacramento and the Pan Pacific terminal in Sacramento

CEMENT DISTRIBUTION CONSULTANTS

Los Angeles and Long Beach Ports

CPC Los angeles (shared with Martin Marietta)

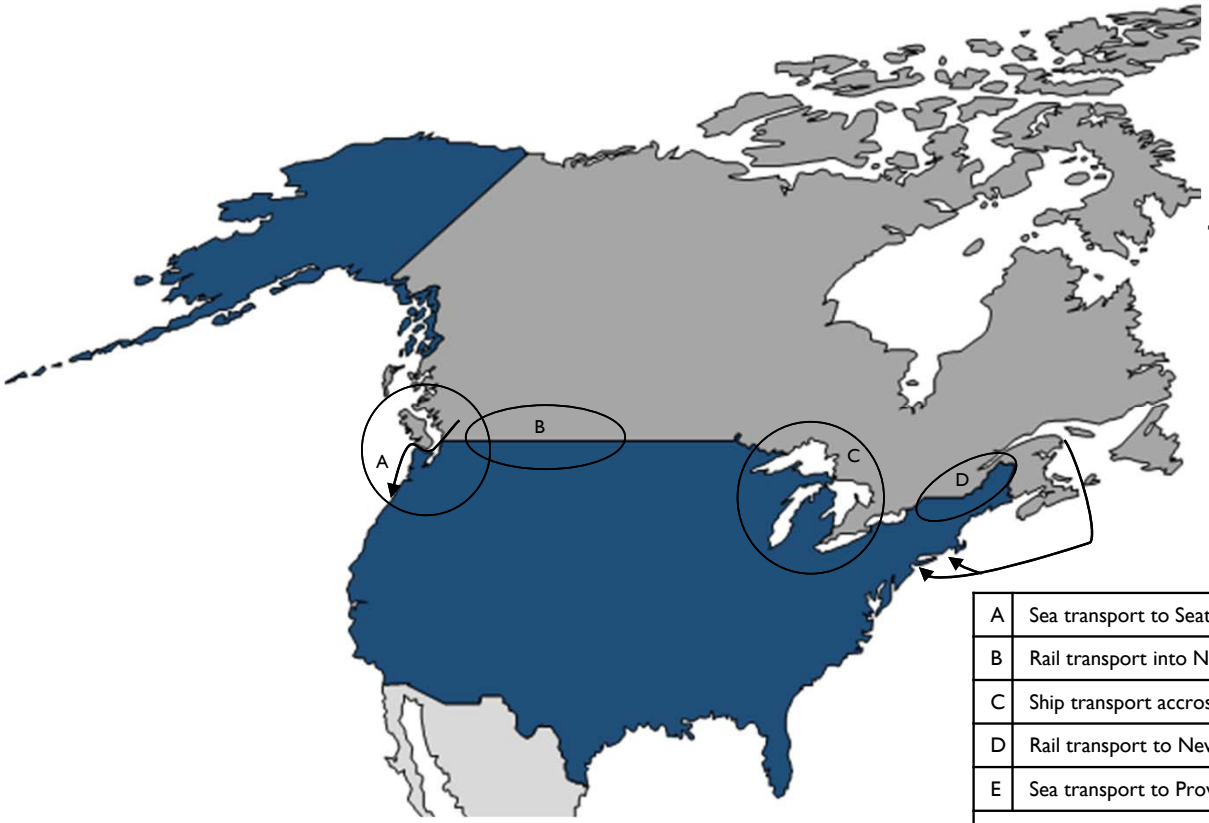
Mitsubishi Long Beach

Cemex Long Beach

The Los Angeles terminals received 175.000 tons in 2022 H1. This is a fraction of the 2006 situation when these 3 terminals handled 2,5 million tons. Of the current import volume 53.000 tons came from Mexic. The remaining volume from Vietnam.

CEMENT DISTRIBUTION CONSULTANTS

US cement and clinker imports from Canada 2022H1



Total 2.187.000 tons

A	Sea transport to Seattle and Portland	383
B	Rail transport into Northwest	227
C	Ship transport accross Great Lakes	897
D	Rail transport to New England and New York	222
E	Sea transport to Providence and NYC	457
Figures in 1.000 tons		

Seaborne imports / exports

- Imports > 5 million
- Imports > 2 millon
- Imports > 0,5 million
- Imports > 0,1 million
- Balance
- Exports > 0,1 million
- Exports > 0,5 million
- Exports > 2 million
- Exports > 5 million

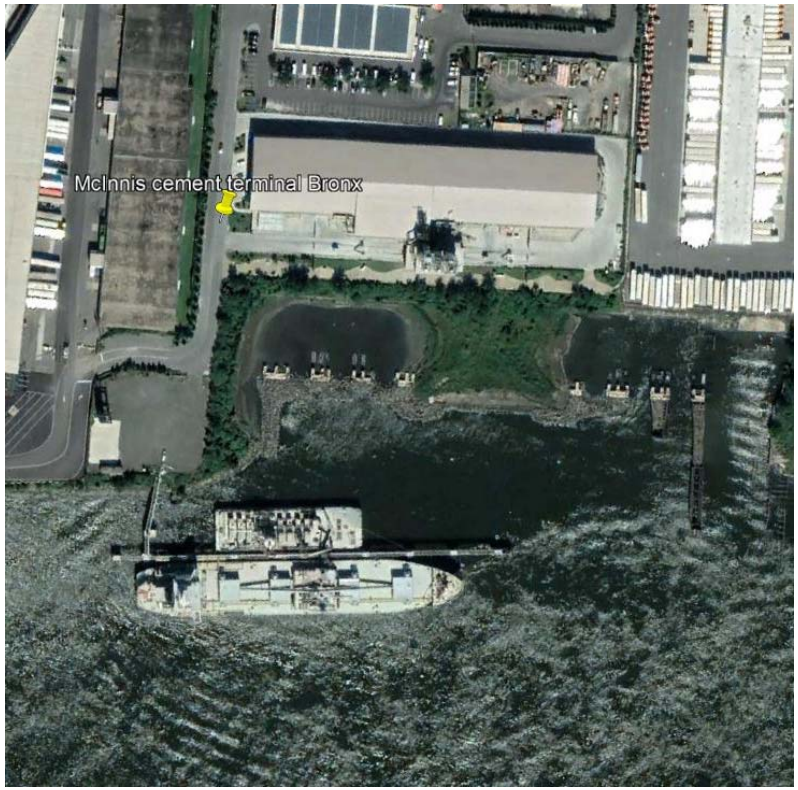
CEMENT DISTRIBUTION CONSULTANTS

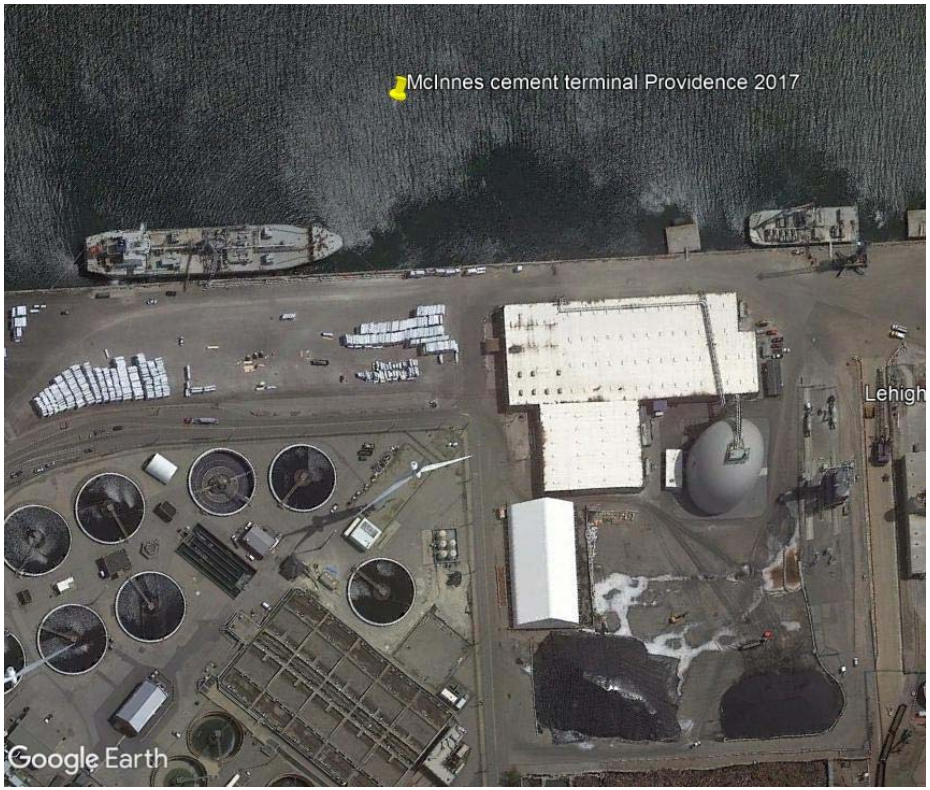
Port of Seattle

Seattle received 0,72 million tons of cement in 2022H1. Canada supplied about 0,36 million tons to the Lehigh and Lafarge terminals and the remaining material came from 4 countries in Asia. Probably not all of the Asian cement went to the Glacier (CPC) terminal in Seattle. It is possible some of this went to the Lehigh terminal in Port Everett.

CEMENT DISTRIBUTION CONSULTANTS

McInnis terminals in the US





Mc Innis imported 458.000 tons from Canada via its terminals in New York and Providence

CEMENT DISTRIBUTION CONSULTANTS

US cement imports from Mexico 2022H1

A	Sea transport to Los Angeles and San Francisco Bay	222
B	Rail transport to Midwest and Texas	739
C	Sea transport to Houston, Tampa, Miami, Wilmington	320
Figures in 1.000 tons		

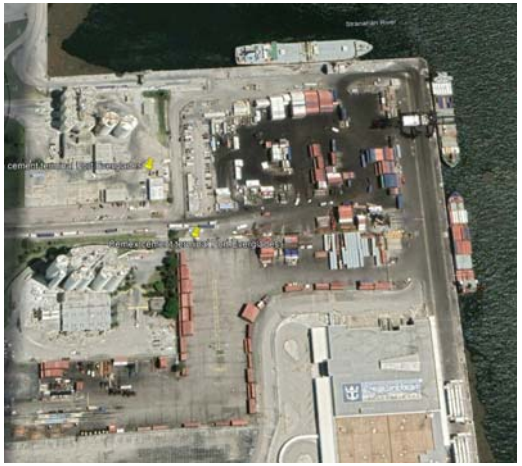
Total 1.281.000 tons

Seaborne imports / exports

- Imports > 5 million
- Imports > 2 millon
- Imports > 0,5 million
- Imports > 0,1 million
- Balance
- Exports > 0,1 million
- Exports > 0,5 million
- Exports > 2 million
- Exports > 5 million

CEMENT DISTRIBUTION CONSULTANTS

Cemex terminals in Gulf and Eastcoast



Apart from Mexican exports to the US westcoast (as described in earlier slides) it exported about 320.000 to its terminals in Wilmington, Miami, Tampa and Mobile. The Cemex terminal in Houston imports from EuroMed.

CEMENT DISTRIBUTION CONSULTANTS

US cement imports from Colombia 2022h1

TotaL 359.0000 tons

A	Houston	11
B	San Juan	188
C	Savannah	100
D	Wilminton	21
E	Norfolk	11
Figures in 1.000 tons		

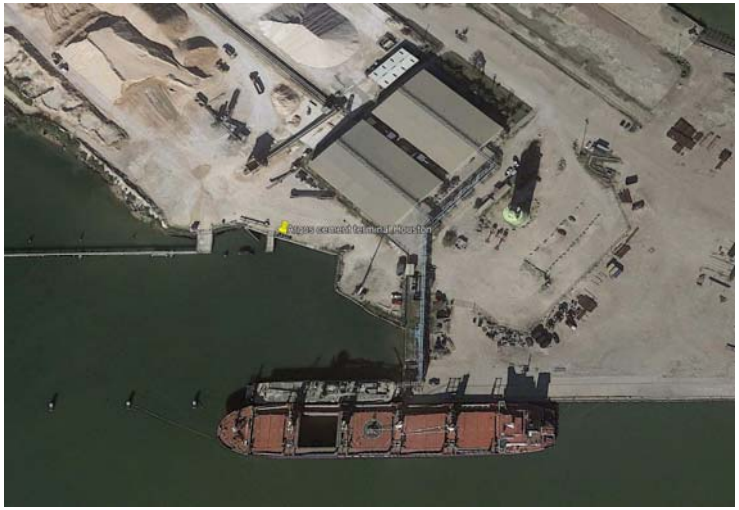
Seaborne imports / exports

- Imports > 5 million
- Imports > 2 millon
- Imports > 0,5 million
- Imports > 0,1 million
- Balance
- Exports > 0,1 million
- Exports > 0,5 million
- Exports > 2 million
- Exports > 5 million

CEMENT DISTRIBUTION CONSULTANTS

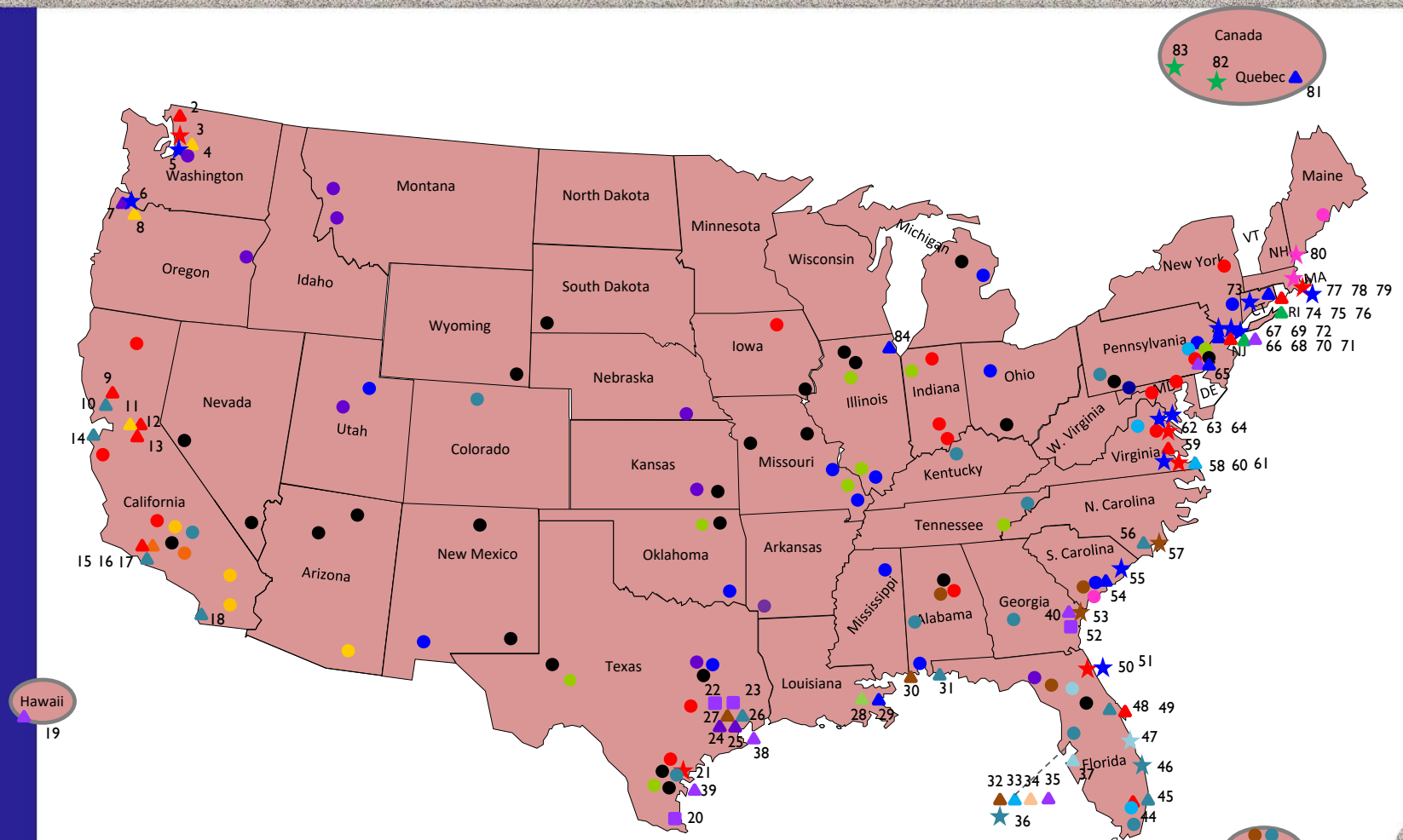
Argos terminals in the US

Argos imported 359.000 tons from Colombia in 2022H1 via its terminals in San Juan, Savannah, Wilmington and Norfolk (and a little via Houston). The Houston terminal imports mainly from EuroMed



CEMENT DISTRIBUTION CONSULTANTS

Cement plant and sea terminal ownership 2020



- LafargeHolcim
- Lehigh (Heidelberg)
- Cemex
- CRH (incl. Ash Grove)
- Argos
- Buzzi Unicem
- Titan
- CPC (Taiheiyo)
- Mitsubishi
- American
- Giant
- McInnis
- Independent importers
- cement manufacturers without import capability

CEMENT DISTRIBUTION CONSULTANTS

Ownership of seaborne cement terminals

No.	Location	Owner	Type	Remarks		No.	Location	Owner	Type	Remarks
1	Anchorage AL	CPC (Taiheiyo)	▲	Active		14	Redwood City CA	Cemex	▲	Not active
2	Everett WA	Lehigh (Heidelberg)	▲	Active		15	Los Angeles CA	CPC (Taiheiyo, Lehigh)	▲	Active
3	Seattle WA	LafargeHolcim	★	Active, cement supply from LH Canada		16	Long Beach CA	Cemex	▲	Active
4	Seattle WA	Lehigh (Heidelberg)	★	Active, cement supply from Lehigh Canada		17	Long Beach CA	Mitsubishi	▲	Not active
5	Seattle WA	CPC (Taiheiyo)	▲	Active		18	San Diego CA	Cemex	▲	Closed
6	Vancouver WA	LafargeHolcim	★	Active, cement supply from LH Canada		19	Barbers Point HI	Hawaiian (Ind)	▲	Active
7	Portland OR	Ash Grove (CRH)	▲	Not active		20	Brownsville TX	Texan Cement (Ind)	■	Active
8	Portland OR	CPC (Taiheiyo)	▲	Active		21	Corpus Christi TX	Lehigh (Heidelberg)	★	Not active
9	Sacramento CA	Two Rivers (A&A, Lehigh)	▲	Active		22	Houston TX	Sesco (Ind)	■	Active, white + grey cement
10	Sacramento CA	Cemex	▲	Active		23	Houston TX	Royal White (Ind)	■	Active, white cement
11	Stockton CA	CPC (Taiheiyo)	▲	Active		24	Houston TX	Houston Cem. East (CRH, Lehigh, Buzzi)	▲	Active
12	Stockton CA	Sunshine (Lehigh)	▲	Closed		25	Houston TX	Houston Cem. West (CRH, Lehigh, Buzzi)	▲	Active
13	Stockton	Lehigh (Heidelberg)	▲	Active (GGBFS)		26	Houston TX	Cemex	▲	Active

CEMENT DISTRIBUTION CONSULTANTS

Ownership of seaborne cement terminals

No.	Location	Owner	Type	Remarks	No.	Location	Owner	Type	Remarks
27	Houston, TX	Argos	▲	Active	44	Port Everglades FL	Lehigh (Heidelberg)	▲	Active
28	New Orleans LA	Buzzi	▲	Used for domestic distr.	45	Port Everglades FL	Cemex	▲	Active
29	Reserve LA	LafargeHolcim	▲	Active	46	West Palm Beach FL	Cemex	▲	Not active
30	Mobile AL	Argos	▲	Not active	47	Ft Pierce FL	Florida Sun (CRH)	▲	Not active
31	Pensacola FL	Cemex	▲	Not active	48	Port Canaveral FL	Cemex	▲	Not active
32	Tampa FL	Argos	▲	Not active. Receives GBFS for grinding	49	Port Canaveral FL	Lehigh (Heidelberg)	▲	Not Active
33	Tampa FL	Titan	▲	Active	50	Jacksonville FL	Lehigh (Heidelberg)	★	Not active
34	Tampa FL	Cemex	★	Active	51	Jacksonville FL	LafargeHolcim	★	Not active
35	Tampa Fl	Cementir	▲	Active, white cement	52	Savannah GA	Argos	★	Not active
36	Tampa FL	Sesco	▲	Under construction	53	Savannah GA	Southeast (Ind)	▲	Active, started 2017
37	Port Manatee FL	Eastern (CRH)	▲	Active	54	Charleston SC	LafargeHolcim	▲	Not active
38	Corpus Christi	Independent	▲	Expected mid 2020	55	Georgetown SC	LafargeHolcim	★	Domestic use
39	Houston	BBM (Sesco)	▲	Expected end 2020	56	Wilmington NC	Argos	★	Not active
40	Savannah	Independent	▲	Active	57	Wilmington NC	Cemex	▲	Not active
41	Gulf Area	Independent	▲	Expected 2021	58	Chesapeake VA	Argos	★	Active
42	San Juan PR	Argos	▲	Active	59	Chesapeake VA	Titan	▲	Active
43	San Juan PR	Cemex	▲	Active white cement	60	Norfolk VA	Lehigh (Heidelberg)	★	Domestic use

CEMENT DISTRIBUTION CONSULTANTS

Ownership of seaborne cement terminals

No.	Location	Owner	Type	Remarks	No.	Location	Owner	Type	Remarks
61	Newport News VA	Pier X (Lehigh)	▲	Active	73	New Haven CT	LafargeHolcim	★	Domestic
62	Baltimore Md	LafargeHolcim 1	★	Domestic	74	Providence RI	LafargeHolcim	▲	Not active
63	Baltimore MD	LafargeHolcim 2	★	Domestic	75	Providence RI	Lehigh	▲	Active
64	Baltimore MD	Lehigh	★	Domestic	76	Providence RI	McInnis (Ind)	▲	Active
65	Bristol PA	Riverside (Ind)	▲	Active	77	Boston MA	LafargeHolcim	★	Domestic
66	Newark NJ	Titan	▲	Active	78	Boston MA	Lehigh	★	Domestic
67	Brooklyn NY	LafargeHolcim	★	Domestic	79	Boston MA	Dragon	★	Domestic
68	Brooklyn NY	Lehigh	▲	Active	80	Newington NH	Dragon	★	Domestic
69	Bayonne NJ	LafargeHolcim	★	Domestic	81	Quebec QC	Beton Provincial (Ind)	▲	Active
70	Brooklyn NY	NYC (Ind)	▲	Domestic	82	St. Catharine QC	McInnis (Ind)	★	Domestic
71	Bronx NY	McInnis (Ind)	▲	Active	83	Oshawa ON	McInnis (Ind)	★	Domestic
72	Queens NY	LafargeHolcim	★	Domestic	84	Chicago IL	Chicago (Ind)	▲	Active (via New Orleans, slag)

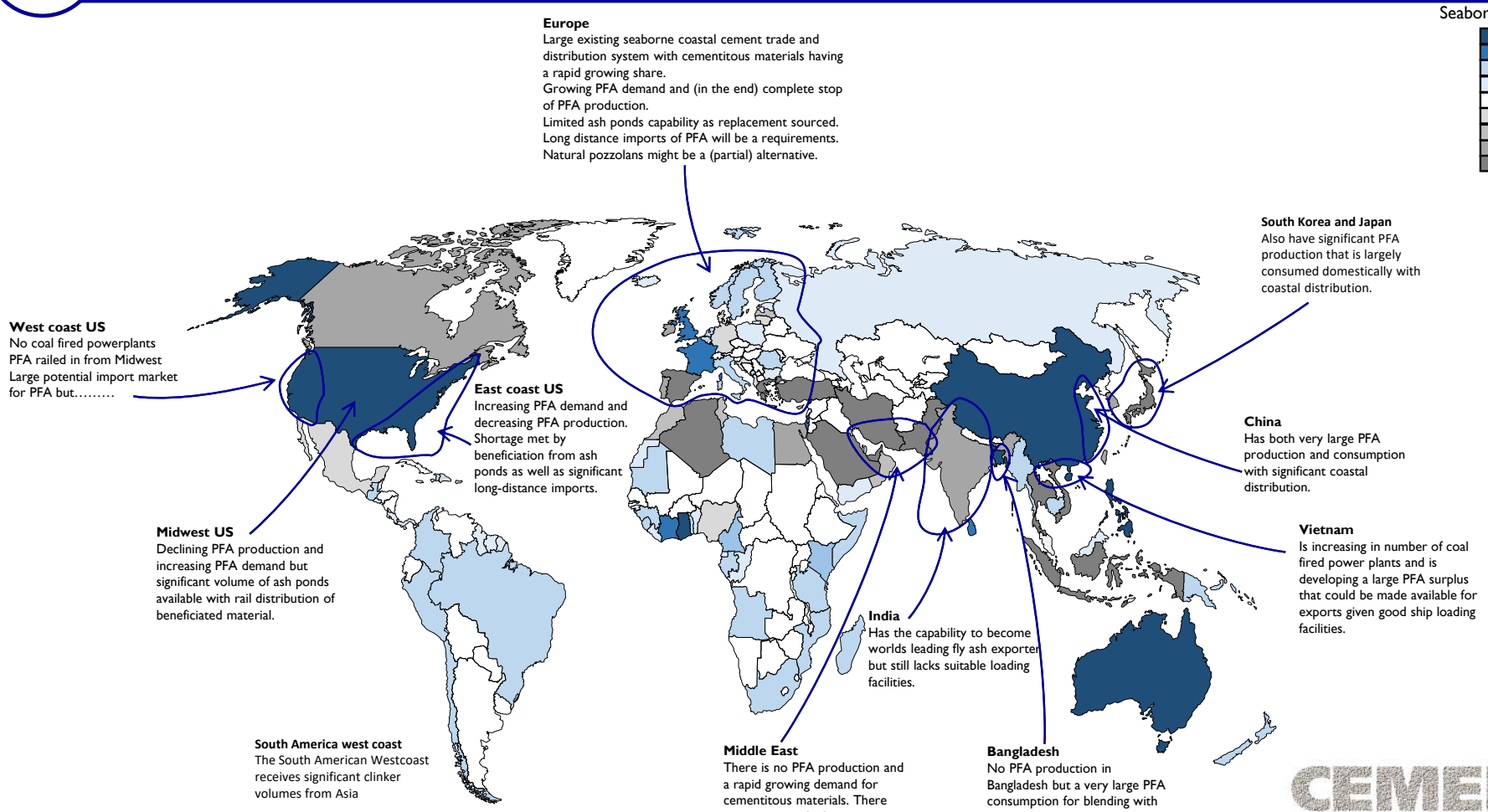
Note: (Ind) = Independent = No cement production facility in US

CEMENT DISTRIBUTION CONSULTANTS

Developments in cementitious materials trade

CEMENT DISTRIBUTION CONSULTANTS

Characteristics of current global seaborne ash trade



Europe
Large existing seaborne coastal cement trade and distribution system with cementitous materials having a rapid growing share.
Growing PFA demand and (in the end) complete stop of PFA production.
Limited ash ponds capability as replacement sourced.
Long distance imports of PFA will be a requirements.
Natural pozzolans might be a (partial) alternative.

South Korea and Japan
Also have significant PFA production that is largely consumed domestically with coastal distribution.

West coast US
No coal fired powerplants
PFA railed in from Midwest
Large potential import market for PFA but……

East coast US
Increasing PFA demand and decreasing PFA production.
Shortage met by beneficiation from ash ponds as well as significant long-distance imports.

China
Has both very large PFA production and consumption with significant coastal distribution.

Midwest US
Declining PFA production and increasing PFA demand but significant volume of ash ponds available with rail distribution of beneficiated material.

Vietnam
Is increasing in number of coal fired power plants and is developing a large PFA surplus that could be made available for exports given good ship loading facilities.

India
Has the capability to become worlds leading fly ash exporter but still lacks suitable loading facilities.

South America west coast
The South American Westcoast receives significant clinker volumes from Asia

Middle East
There is no PFA production and a rapid growing demand for cementitous materials. There are no terminals that can receive bulk fly ash and so it is imported in big bags in containers from India.

Bangladesh
No PFA production in Bangladesh but a very large PFA consumption for blending with cement. The PFA is supplied from northeast India to Bangladesh in general cargo coastal / river barges that are unloaded by pneumatic unloading systems.

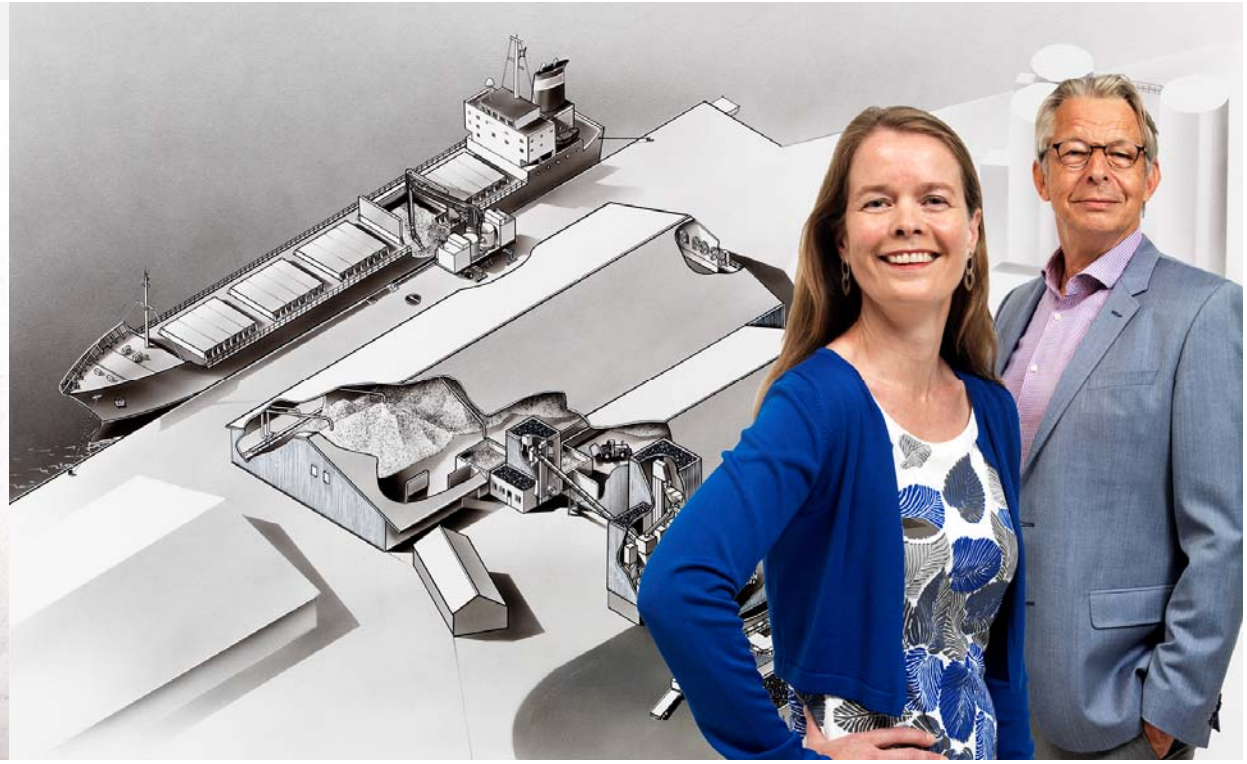
CEMENT DISTRIBUTION CONSULTANTS

Final considerations

CEMENT DISTRIBUTION CONSULTANTS

- US imports continued with significant growth in 2022H1 and this looks set to continue for the full year, What will happen after that is uncertain. Apart from the global uncertainties there are also some domestic developments that have the potential to change the import situation significantly. These are the change from Type I-II cement (with a 95% clinker content) to a limestone cement (with 80% clinker). This could mean that cement plants could produce more cement which would have an adverse effect on imports. Apart from this the demand for cementitious materials is growing rapidly. This will be fly ash and natural pozzolans as the current GGBFS supply cannot be expanded.
- The US has many import terminals but the majority of these are not very flexible. The US cement producers have used their import terminals as a regulating valve to keep their cement plants at maximum utilisation. They did not make investments to increase their terminals when the Supramax bulkcarriers started to replace Handysize and Handymax vessels. Will they make investments to make their terminals larger and more flexible to meet the need for imports multiple materials. It is a big question. The profit model of the cement industry is based on producing clinker and that is producing CO2. This whole business model is coming under severe pressure but as yet it is difficult to see what the consequences will be.
- The independent terminals clearly are becoming larger and more flexible and this looks set to continue.
- Because of the high clinker content of the type I-II cement is never was economical to import clinker and grind cement. The change to limestone cement with its much lower clinker content changes this however. Importing clinker in large vessels and building grinding plants now looks to be a very economical solution that also can adapt to new technologies and products.

CEMENT DISTRIBUTION CONSULTANTS



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