Current developments in global seaborne cement and clinker trade

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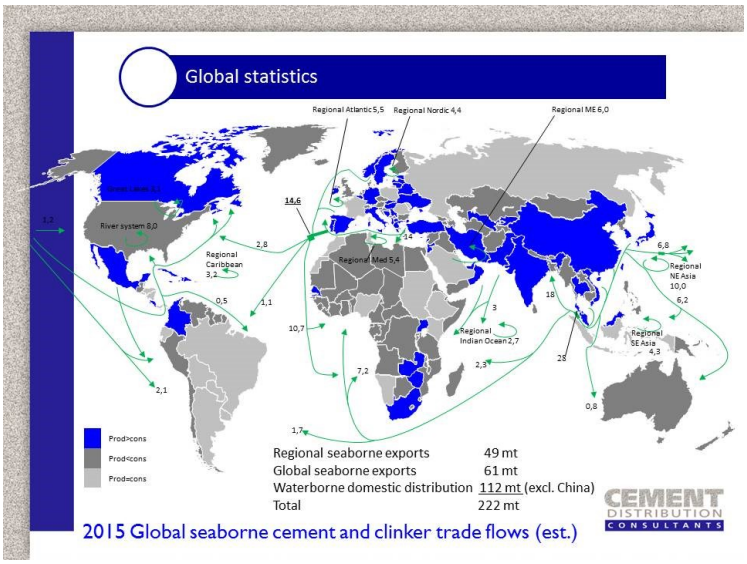
Introduction

The current global political and economical developments are having a substantial effect on cement consumption worldwide. In 2015 growth in global cement demand was negative (-1,9%) and in 2016 demand is forecasted to be just around 1%. The result of this slow down in combination with substantial new production capacity still coming online is causing a substantial surplus capacity especially in China which would be available for exports. There are still areas of growth in cement demand. This is most notably the case in the US and Africa. These are very different markets though and this is reflected in the methods and types of trade. This article will give an overview of the existing trading situation in 2015. In addition it will look at the trade mechanisms and the effect that they have on the surplus production capacity in Asia that is building. Lastly the growth markets in the US and Africa will be considered.

Cement and clinker trade in 2015

Figure 1 shows the key global trade flows. Countries that have a surplus clinker and cement production capacity are shown in blue; countries that have a clinker production shortage (and import clinker and/or cement) are shown in dark grey and countries where clinker and cement production about meet demand are shown in light grey. The key global export area is North East Asia. The combined seaborne clinker and cement exports of China, South Korea, Japan and Taiwan in 2015 were about 50million tons. When the exports of Vietnam, Thailand and Malaysia are added the total is 72million tons or 65% of global seaborne exports. About 31 million tons of these exports is traded within the region. Of the remainder about 7 million tons is exported to the Americas, about7 million tons to Australia and New Zealand, about 18 million tons to South Asia and 9 million tons to Africa. South and South East Asia, as well as the Middle East show a more diverse picture with both exporting and importing countries and as a result a substantial regional trade.



Europe is also a large exporter of cement and clinker. In total about 40 million tons is exported by sea, largely from the Mediterranean export countries. Of this volume at least 25 million tons is traded to North and West Africa about 3 million tons to the US, about 1 million tons to South America and 11million tons is traded within Europe.

The US is forecasted to be on its way again to be the largest importer of cement in the world. In 2010 seaborne cement imports were down to 2,9 million tons. In 2015 the volume increased to 7.1 million tons (est.). PCA forecasts show that seaborne imports could grow to 22 million tons in 2020 and to 30 million tons in 2025 exceeding the record volume of 29 million tons in 2006. Despite the large increase in cement production capacity in Africa imports are still set to grow. This is not only because of a strong growth in cement consumption, but also because a substantial part of new production capacity are grinding plants. Although bagged cement imports are stagnating clinker imports are gaining rapidly in volume. In 2015 the whole of Africa imported about 39million tons of cement and clinker.

South America is largely self sufficient receiving some clinker from Asia and Europe. In Australia and New Zealand some integrated cement plants are closed down and production is re-

placed by clinker and cement imports.

Figure 2 shows shipments by cargo type. Of the 110 million tons traded internationally by sea 15.5% is bagged cement, 44.6% is bulk cement and 39.9% is clinker. For seaborne domestic trade (93 million tons) 77.5% is bulk cement (in majority transported in self discharging cement carriers), 10.1% is clinker and 12.4% is bagged cement. Countries with large seaborne domestic distribution systems are Japan, Indonesia and Vietnam.

Figure 3 shows clinker and cement trade by

CLINKER AND CEMENT TRADE BY WATER			
Clinker / cement type	Seaborne trade (Mt) International	Seaborne trade (Mt) Domestic	Inland water domestic trade (Mt)
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**

vessel type. The total volume of cement and clinker that is moved (both international and domestic) by water is 222 million tons. Of this volume 33.1% is shipped in large bulk carriers, 14.6% in coastal bulk carriers, 437.7% by self-discharging cement carriers and 8.6% by inland waterways ships and barges.

CLINKER AND CEMENT TRADE BY VESSEL TYPE				
Clinker / cement type	Bulk Carriers (Mt) Large	Bulk Carriers (Mt) Coastal	Self-disch. cement carriers (Mt)	Inland ships & barges (Mt)*
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*				

Current developments

The slowdown in the growth of global cement consumption in combination with new production capacity still coming on line is creating a surplus production capacity that is available for export. Especially the economic slowdown in china could create a gigantic export capability for cement and clinker. Export prices for cement and clinker have already dropped to levels which are the lowest since the 1998 Asian crisis. Shipping costs are also very low and are forecasted to stay there for several years. Taking these F.O.B. export prices into account in combination with shipping costs to a wide range of destinations world wide then it is clear that it would be quite profitable to export cement to almost any country in the world. In financial investor circles there is serious concern that this might happen and that stable cement markets might be uprooted by uncontrolled imports with a deteriorating effect on the profitability of the local cement industries.

Uncontrolled imports on a large scale are unlikely to happen though. There are two key reasons for this. The first reason is that the trade of clinker and bulk cement (which make up for 84,5% o international trade) requires specialist facilities. Clinker is a half product and still needs a grinding plant to produce and sell cement. Bulk cement imports require specialised storage and handling facilities in (or close by) a port. The owners of these facilities and grinding plants control cement and clinker trade. Realising new grinding plants and bulk import facilities takes time. In the west coast of the US a permit for a new bulk import terminal or grinding plant can take 5-6 years and millions of dollars. Even in Africa realising a new facility can take several years. Taking into account the cyclical nature of global trade the realisation of new facilities is a substantial obstacle. The imports of both bagged and bulk cement also face a second constrain and that is a vulnerability to anti dumping claims. Cement plants, when selling cement domestically will include a contribution margin to capital costs and profit on top of the pure production costs of the cement. When exporting though the F.O.B. price will have a substantial lower contribution margin to allow for the transportation cost, the costs of the importing and a profit for the importer. For the exporting cement plant selling at this lower contribution margin makes a lot of sense. Not only does the export contribution margin go directly to the bottom line but by increasing the utilisation of the plant with the exported volume the production costs per ton of the plant will go down for both the domestic and export sales. This can be illustrated with the following rough example. A cement plant with a production capacity of 2 million tons per year can sell 70% of its capacity domestically at a price of US$ 80,00 per ton. Its pure production cost (raw materials, labour, energy, maintenance) are US$

38 per ton at that plant utilisation factor. The plant now exports 400.000 tons per year at an F.O. B. price of US$ 40 per ton. This not only means that the plant realises an extra contribution margin of US$ 2,00 per exported ton. What happens is that the plant now has a utilisation factor of 90% and its production costs drop US$ 3,00 per ton over both the 1,4 million tons domestic sales plus the 0,4 million ton export sales. Exporting the 400.000 tons per year thus brings a total additional contribution margin of US$ 6,2 million.

For the country that imports the cement, it looks a bit different. The exporting cement plant sells its cement domestically for US$ 80,00 per ton and for exports its sells at US$ 40,00 per ton. If therefore is selling its exported cement below real value and is dumping its cement. When only the definition of "Selling below real value" would be used then nearly all exported cement would be considered dumping. However an anti-dumping suit can only be made when the imported cement is considered to be sold below real value <u>and is causing harm.</u>

This means that when a country has a cement shortage then cement imports do no harm and therefore imported cement is not considered to be dumped. However, when a country has no shortage and imported cement is harming its domestic cement industry then it is very likely that anti dumping measures will be taken. Two exceptions are possible. The first is when a ready-mix group imports cement for its own use and does not sell it on the open market. These imports usually are not considered dumping. The same argument applies for large construction companies that are importing cement for a specific construction project. The second exception is when a government considers its domestic cement industry to charge too high prices and will allow imports to lower the price level. It should be noted that anti dumping for clinker imports is a much more complicated issue as it is a half product and therefore imports of clinker do not force such restrictions.

The combination of anti dumping regulations and the requirement for dedicated facilities to import cement and clinker ensures that it is not possible to have large uncontrolled imports in countries that do not have a cement shortage. The enormous surplus cement production capacity that is building up in Asia will have to stay there unused. What can happen though is that in countries that are facing a (future) cement shortage the construction of new production capacity might be postponed as importing cement (and even more so clinker) might be more economical at the current very low price levels.

We now will look at two large import markets and see how the anti-dumping regulations and the need for dedicated facilities affects the way these imports are realised.

<u>The US import market</u>

The current strong growth of cement imports in the US is actually the third wave since the early 1980's. In between there have been two economical downturns (1991 – 1994 and 2007 – 2014) that reduced seaborne imports almost to zero (29,2 million tons in 2006 to 2,9 million tons in 2010 during the last downturn). In the first wave of growing imports (1983 – 1990) a lot of these imports were realised by companies not involved in cement production in the US. When the downturn occurred the US cement industry responded with antidumping suits (Japan, Mexico) and started to acquire the independent import terminals. As a result there are currently only 6 import terminals in the US (of a total number of 72 coastal cement terminals) that are not owned by US cement manufactures and during a downturn almost no cement is sold by independents on the "open" market. When there is a cement shortage in the US then in theory everybody has the right to import. Due to the fact however that it takes so long to get permits there is quite a barrier for new importers to overcome. As a result the US cement manufacturers effectively control the cement imports into the US.

Figure 4 shows the cement market situation in the US in 2014. For every state the difference between its cement production and consumption has bene calculated by Cement Distribution Consultants based on US Geological Survey statistics. States in blue colours have a cement shortage; States in grey colours have a cement surplus. By grouping the states into

regions that more or less are part of the same distribution area, the surplus or shortage by region can be calculated and with that the imports and intra regional cement flows. These are all shown in this map. The location of US cement plants are shown as well. In 2014 seaborne imports totalled 3.715.000 tons. Of this quantity 1,4 million tons went into Houston, which has been one of the few ports that continued to import during the crisis. In California imports in 2014 were still almost zero with only one terminal becoming operational again at the end of the year. In the rest of the US west and east coasts moderate imports started again and a number of terminals were reopened. In 2015 the seaborne import volume was 7,2 million tons.

The spreadsheet model behind the map in ***figure 4*** can be expanded to forecast where future cement imports will be required. Using the PCA projections and forecasts for cement consumption and production Cement Distribution Consultants has made a map (***figure 5***) that shows the cement surplus / shortage situation in the US for 2025 and based on that it has projected the import volumes by region. Based on these projections the required seaborne imports in 2025 would be over 22 million tons. About half this volume would go to the Gulf of Mexico with Texas requiring a stunning 7,7 million tons. Due to the large combined cement shortages in the Great lakes and North Central regions the large cement surplus in Missouri is distributed to the north via the big rivers and additional imports of over 3 million tons would have to be imported via New Orleans to balance the resulting shortage in the south of the Big Rivers region. Seaborne imports to the east and west coasts will also have grown considerably but still will be well below 2006 levels.

What are the consequences for US cement terminals with this new wave of growing imports? ***Figure 6*** shows the locations of these terminals together with the 2006, 2014, 2020, 2025 and 2035 (projected) import volumes for the regions in which they are located. The 44 terminals featured by a blue triangle have a ship unloader and as such are able to receive cement in (large) bulk carriers. The 28 terminals featured by a green asterisk do not have a ship unloader and have to be supplied by self-discharging cement carriers. These terminals in the past were used for short distance imports from either Canada or South America and also for domestic distribution. The

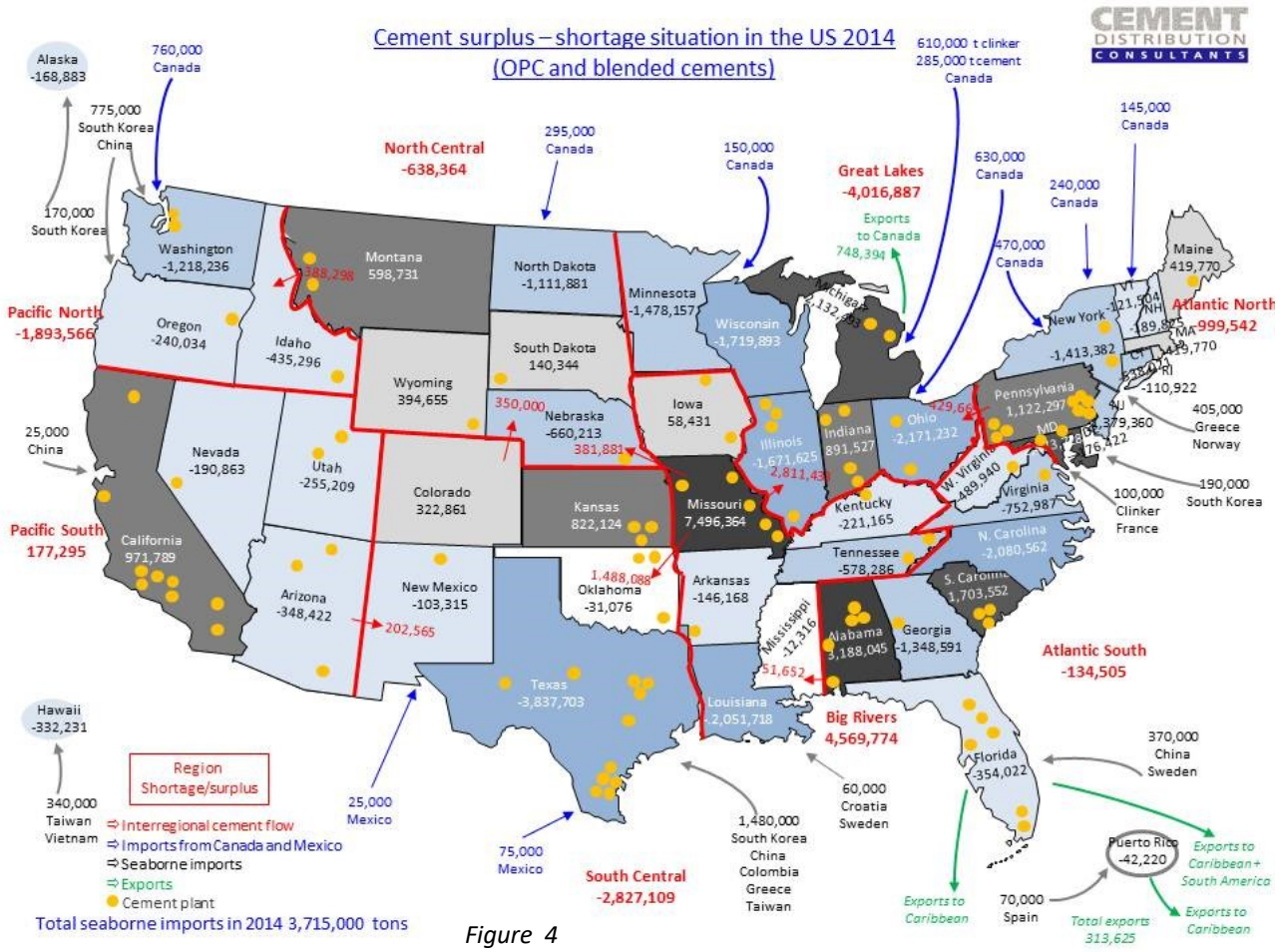


Figure 4

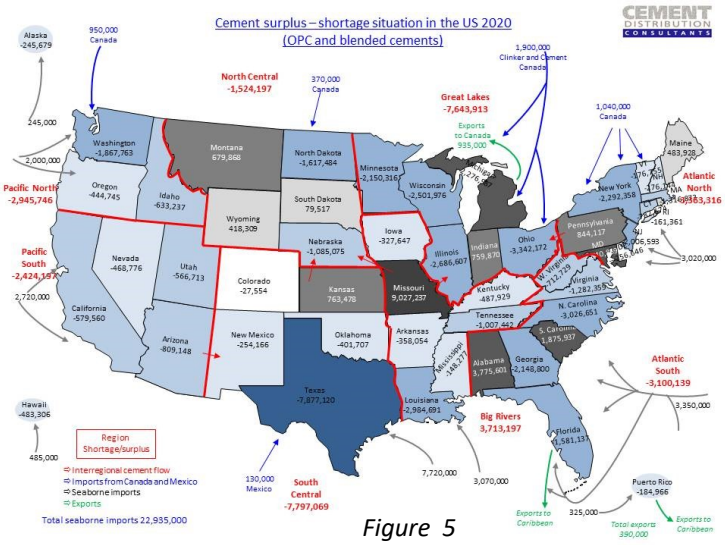


Figure 5

terminals with a ship unloader received their cement by bulk carriers either form Asia or Europe. Of the 72 terminals only 8 were involved in cement imports in 2010 when the imports were at the lowest. The other terminals were either mothballed or used for domestic distribution. By the end of 2015 the number of terminals that were involved in cement imports had increased to 21.

Looking at the 44 terminals with a ship unloader that were designed to import cement from Asia or Europe a very bleak picture emerges. Half of these terminals have been built at the end of the previous import wave (i.e. 2000 – 2007) and as such have seen more years of crisis than profitable imports Even terminals of 30 years old have seen 10 years of almost zero seaborne imports. Given the cyclical nature of US seaborne cement imports it is necessary to have a very critical review of terminal design. The terminals that have been built at a high capital cost and with both storage facility and dock fully dedicated to cement have been an enormous burden to their owners during the crisis. Terminals that were built at much lower capital cost and were part of a multi product port facility also did not do well during the crisis but at a much lower cost to their owners. For terminals involved in cyclical business a rapid R.O.I. and flexibility in use should be key design requirements.

With so many terminals still mothballed or used only for domestic distribution the question is if new facilities need to be build to meet the growing seaborne imports. The following considerations have to be taken into account in this respect.

According to recent PCA forecasts it will take till about 2024 before Us seaborne imports will reach the 2006 level of 29 million tons. In this respect the existing US cement terminals should be able to handle this volume.

However, imports will not be distributed in the same way. Texas for example will reach 2006 levels soon and in the coming years will need new terminals. In then North West also 2006 levels will be reached in a few years.

The ownership situation in the US cement industry has changed in the past 10 years and the ownership of cement terminals does not reflect the current market share of the US cement producers. To maintain market share some cement producers will have to realise import capability.

South America as a supply basis for US cement imports has declined considerably. This means that this reduced supply has to be compensated by cement from Asia and Europe which requires larger facilities with a ship unloader instead of the smaller terminals supplied by self-discharging ships.

Shipping has changed. The large US cement terminals have all been built for Handymax bulk carriers with a cargo size of about 40.000 tons. The Supramax bulk carrier that has come up during the crisis has a considerable lower transportation cost per ton. It can carry cargoes of 50-55.000 tons. At present only 7 US cement terminals are able to handle such vessels effectively.

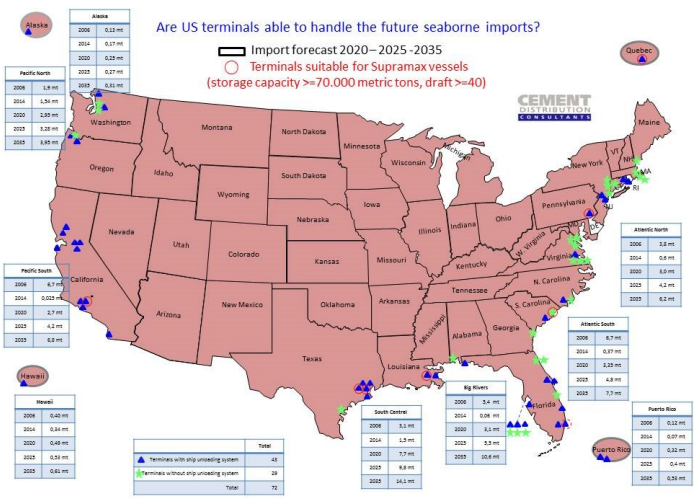


Figure 6

Now the US is in a shortage situation again, imports are not causing harm, so everybody has the right to import. It is likely that not only US manufacturers will import but that others will try to.

Therefore, although the current available cement terminals would be able to handle the increasing import volume, new terminals construction and terminal expansions are already taking place and this will continue in the coming years.

The Africa import market

The Africa import market is very different in nature. Whereas US imports nearly entirely consist of bulk cement, African imports consist for the largest part of clinker, a still sizable volume of bagged cement and only a small percentage is bulk cement. In ***figure 7*** the current trade situation around Africa is shown. The continent received about 24,7 million tons from Europe of which 14 million tons to North Africa and 10,7 million tons to the West coast. From Asia (incl. ME) 14 million tons was received of which 6,3 million tons to the East coast and 7,7 million tons to the West Coast. The red line on the map shows where most of the integrated cement plants are located. On the West Coast only Nigeria, Senegal and Angola (red dots) have a significant capacity of integrated plants. When we look at ***figure 8*** (which shows the locations of grinding plants with green triangles and bulk cement terminals with red dots) the consequence becomes quite clear. The lack of integrated cement production capacity has resulted in a large number of stand alone grinding plants that rely on imported clinker. Even with the large number of new integrated plants being built the number of grinding plants has increased with 18 in the last 3 years and 5 plants have increased capacity. This is even without taking into account the number of Plug & Grind mini grinding plants made by Cemengal of which at least 12 have been sold into Africa. Imports of bagged and bulk cement into Africa are always facing uncertainty due to possible anti dumping claims by the local cement industry and sometimes unstable economical and political developments. Bagged cement will find its way to shortages but at a high cost. Investing in bulk terminals is too uncertain. Building a grinding plant and importing clinker has proven to be the most acceptable solution for the African situation and this trend is expected to continue in the coming years.

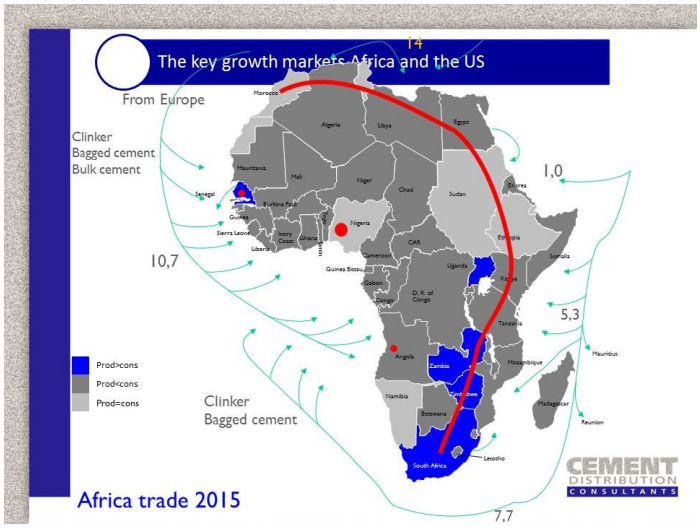


Figure 7

Conclusions

Faced with the barriers of antidumping regulations and the requirement of dedicated facilities to import bulk cement and clinker it is highly unlikely that the large surplus production capacity in Asia (especially in China) that is currently building up will find its way into uncontrolled exports. What this large available surplus capacity, in combination with current very low shipping costs can do is that new production capacity additions in other areas of the world might be postponed and replaced by imports. In most such cases this will be done by clinker imports rather than bulk cement as clinker can be handled and shipped at a lower cost than cement. The result will be an increasing number of stand alone grinding plants, especially in Africa but also in other areas in the world.

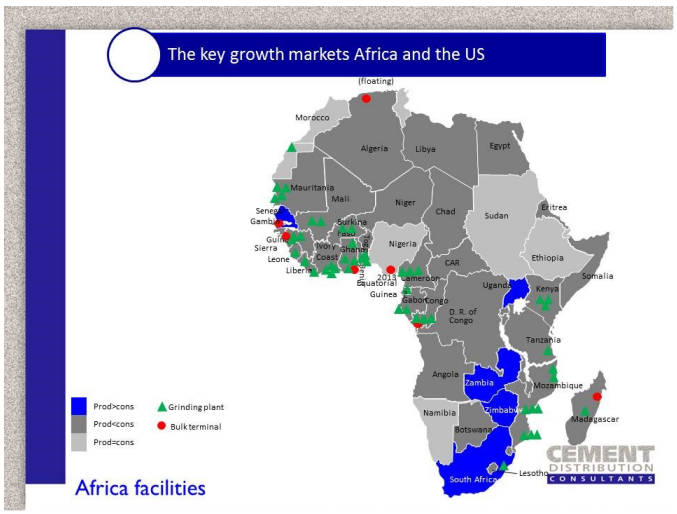


Figure 8

If the US will move towards clinker imports is a big question. For new comers it will be easier to realise clinker imports via existing general bulk terminals. Small grinding plants can be build in areas which are not as restrictive in respect to permits compared to ports. So there might be openings for clinker imports which also can be realised easier in Supramax vessels than bulk cement. However, given the facto that the existing players still have their bulk cement terminals available will ensure that bulk cement will remain the default method for US imports.

Although global cement consumption will see little growth in the next few years, the picture looks a bit better for cement and clinker trade based on the developments described in this article.