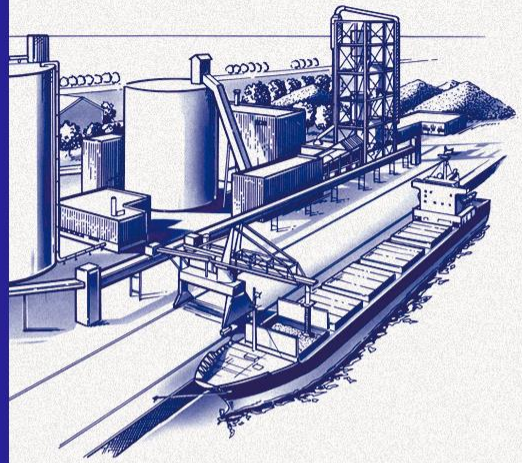

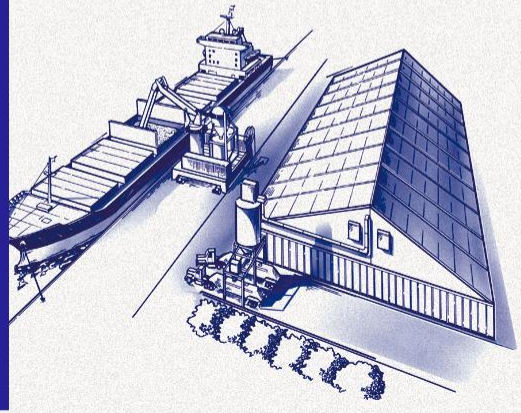

INTERNATIONAL CEMENT CONFERENCE
Cemtech
PRODUCTION EXPERTISE - MANAGEMENT SKILLS

Cement and clinker trade in Africa and the Middle East

9 February 2021

Ad Ligthart

CEMENT DISTRIBUTION CONSULTANTS

Introduction

This presentation covers the cement and clinker trade of Africa and the Middle East. As I first did such a presentation at the Cemtech conference in Marrakesh almost exactly 8 years ago I have made the comparison between then and now. What becomes very clear then is how big the differences are between the MENA region and Sub Sahara Africa. Whereas cement consumption has remained overall stagnant in the MENA region, Sub Sahara Africa has been growing significantly and has the potential still to more than quadruple its cementconsumption. As such everybody wants to be there. A proliferation of stand-alone grinding plants (with the related clinker imports) has been the result.

What is the current situation and how is cement and clinker trade going to develop. Let's have a look!

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Contents of presentation

- Key aspects of the region's cement and clinker trade
- What has happened in the past eight years
- Why clinker trade and not cement?
- What will the future bring?
- Closing remarks

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Key aspects of the region's cement and clinker trade

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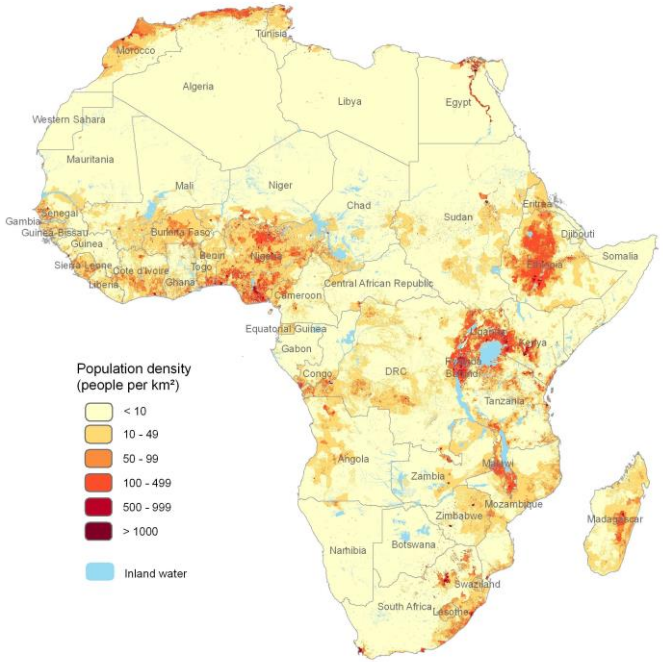
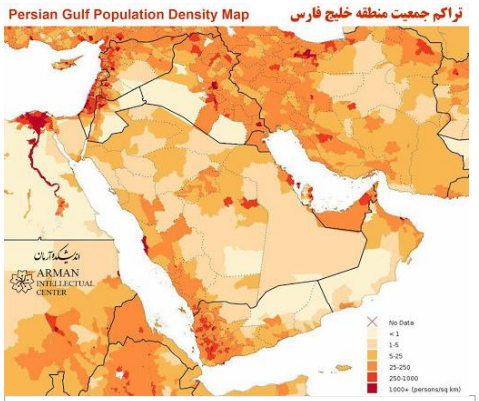
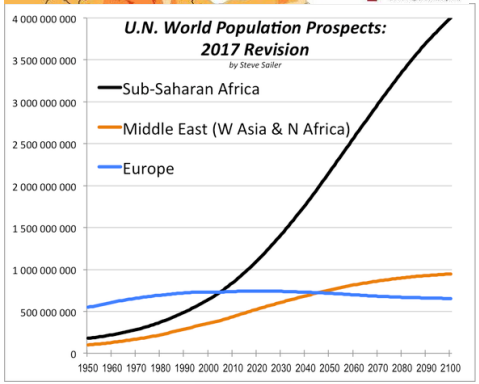
Key aspects of the region







Cement consumption in Africa and the Middle East is very much determined by the population density and the population growth as well as……

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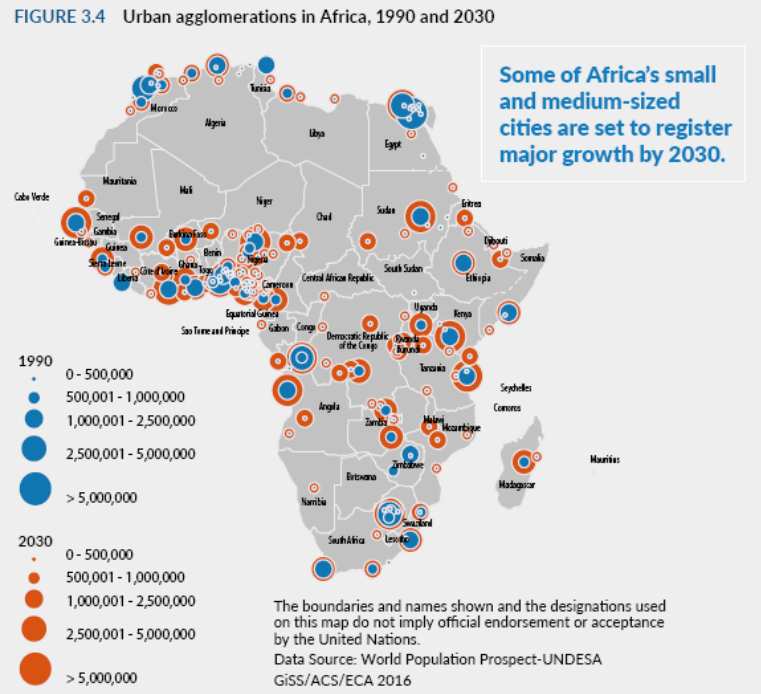
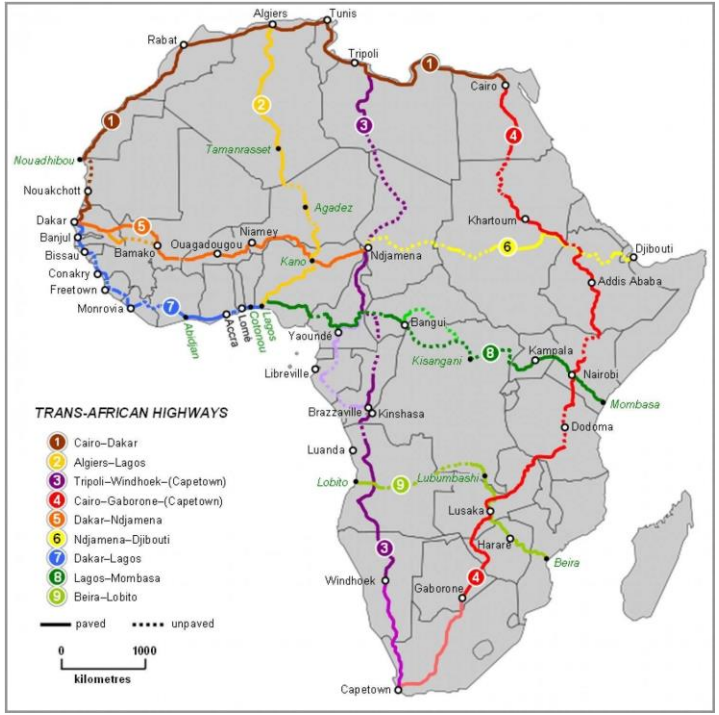
Key aspects of the region





….the urbanisation of the region and this infra structure work.

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What has happened in the past eight years?

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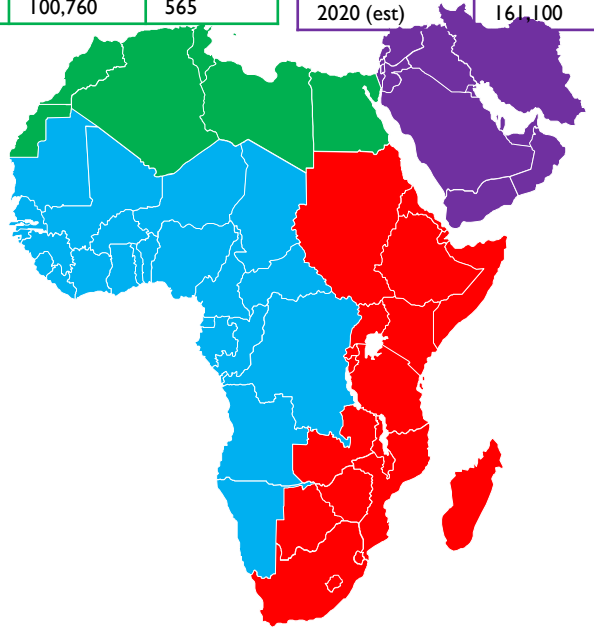
What has happened in the past eight years?

North Africa		
Year	Cem. cons	Per capita
2012	101,660	600
2020 (est)	100,760	565

Middle East		
Year	Cem. cons	Per capita
2012	180,570	801
2020 (est)	161,100	655



West Africa		
Year	Cem. cons	Per capita
2012	47,510	103
2020 (est)	60,610	106

East Africa		
Year	Cem. cons	Per capita
2012	37,770	86
2020 (est)	58,240	102

Looking at the developments of cement consumption in Africa and the Middle East over the last eight years we can see that the MENA and sub-Sahara Africa regions have significantly different patterns. In North Africa cement consumption has remained stable whilst new production capacity has reduced the need for imports and has allowed for exports of clinker and some bagged cement. In the Middle East cement consumption has dropped significantly and the region has become a significant exporter.

Sub Sahara Africa has seen significant growth of cement consumption and, given its still low cement consumption per capita, still has a lot of potential for further growth. A large number of new cement plants has been built but the number of stand-alone grinding plants has about exploded ensuring a current over-capacity.

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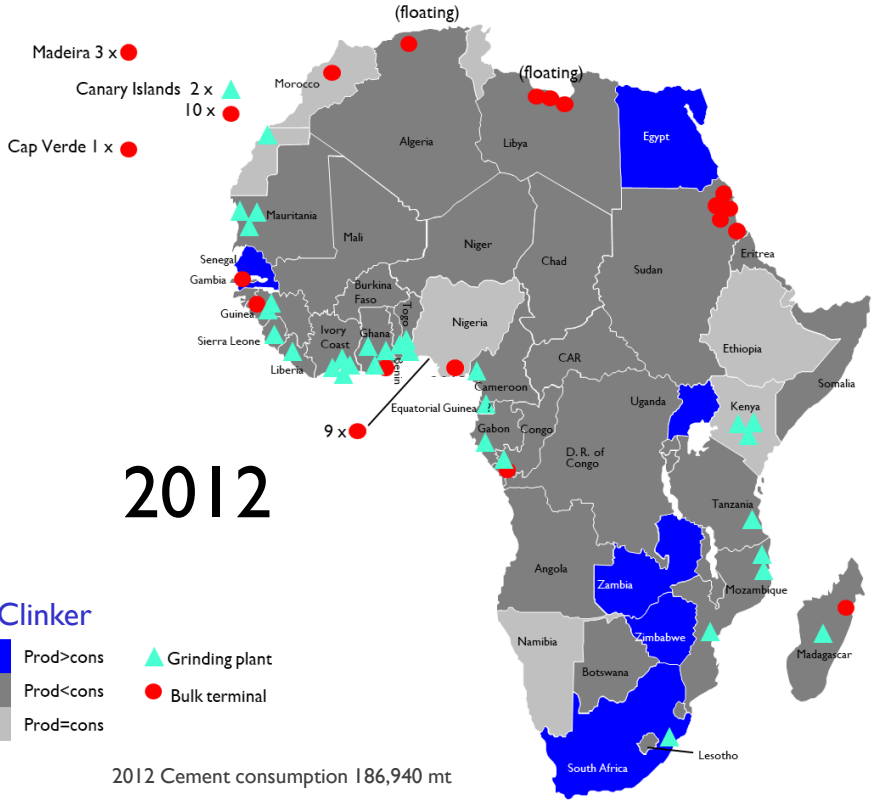
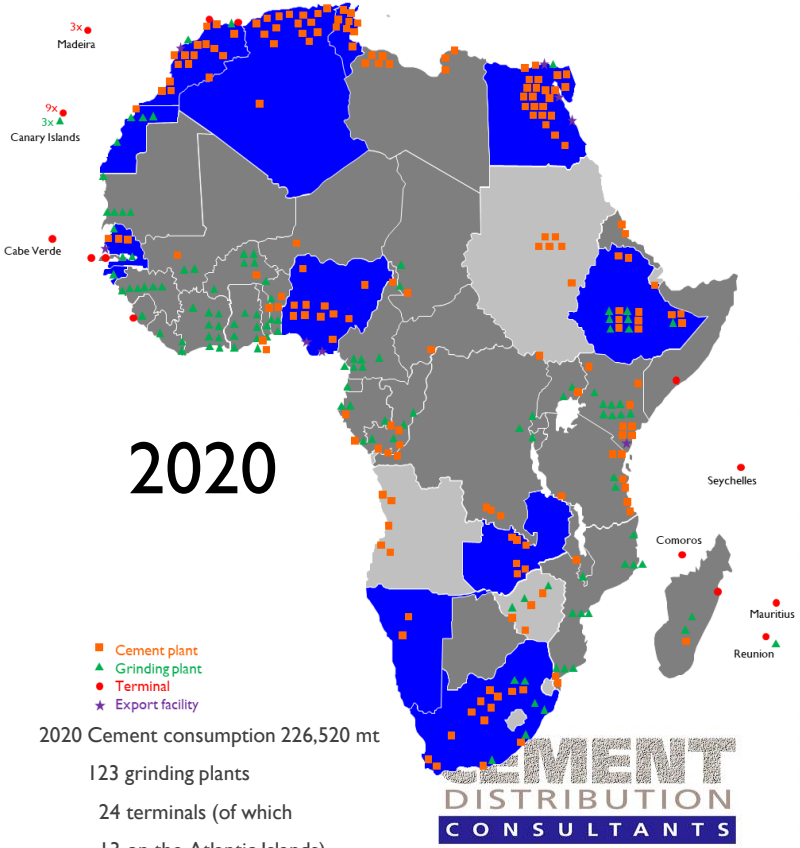
What has happened in the past eight years?



2012



2020

Clinker

- Prod>cons
- Prod<cons
- Prod=cons

- Grinding plant
- Bulk terminal

- Cement plant
- Grinding plant
- Terminal
- Export facility

2012 Cement consumption 186,940 mt

33 grinding plants

30 terminals (of which

14 on the Atlantic Islands)

2020 Cement consumption 226,520 mt

123 grinding plants

24 terminals (of which

13 on the Atlantic Islands)

184 cement plants

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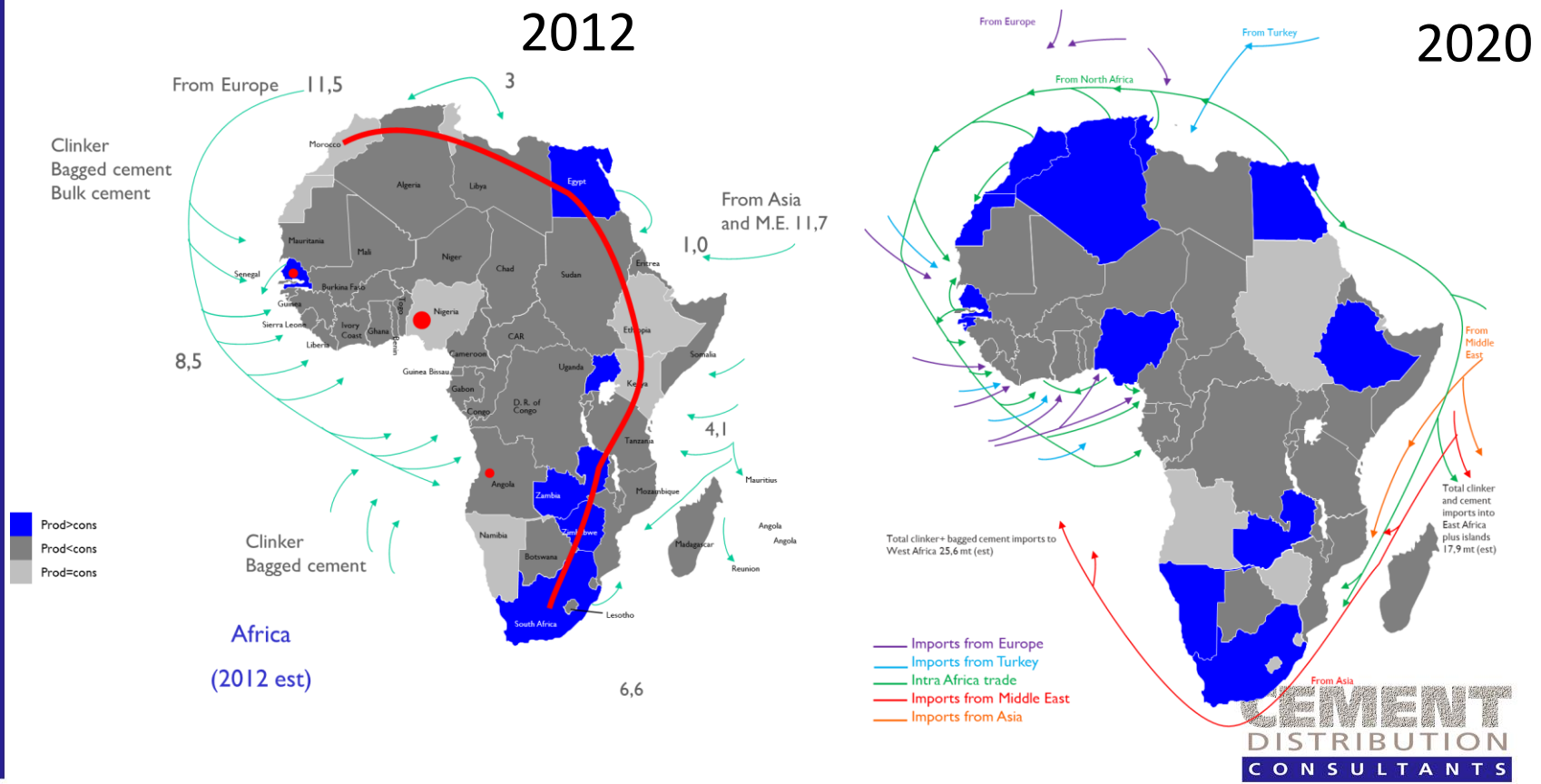
What has happened in the past eight years?



What has happened in the past eight years?

2012 Cement consumption 180,570 mt
- 12 export bases
- 14 terminals
- 3 grinding plants
- 6 mt seaborne trade within ME
- 3 mt ME to Africa
- Imports to Israel approx. 0,8 mt.

2020 Cement consumption 161,100 mt
- 17 export bases
- 14 terminals
- 14 grinding plants
- 8,3 mt seaborne trade within ME
- 4,4 mt ME to Africa
- Imports to Israel approx. 3 mt.

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Why clinker trade and not cement?

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Why clinker trade and not cement?

- A large number of integrated cement plants have been built in Africa in recent years, but the number of new stand-alone grinding plants have been significantly bigger with a resulting large clinker import volume. Cement imports into Africa (both bulk and bagged) have decreased.

- Grinding plants importing clinker are preferred over cement import terminals as the port facilities can be much simpler. Grab and hopper discharge is possible. Clinker can be stored on the dock and then trucked to grinding plants outside the port. Cement terminals required dedicated unloading equipment and storage facilities or which in many (congested) ports there simply is no space.

- Grinding plants in many countries are preferred to integrated cement plants as they are much more resilient to unstable and fluctuating markets.

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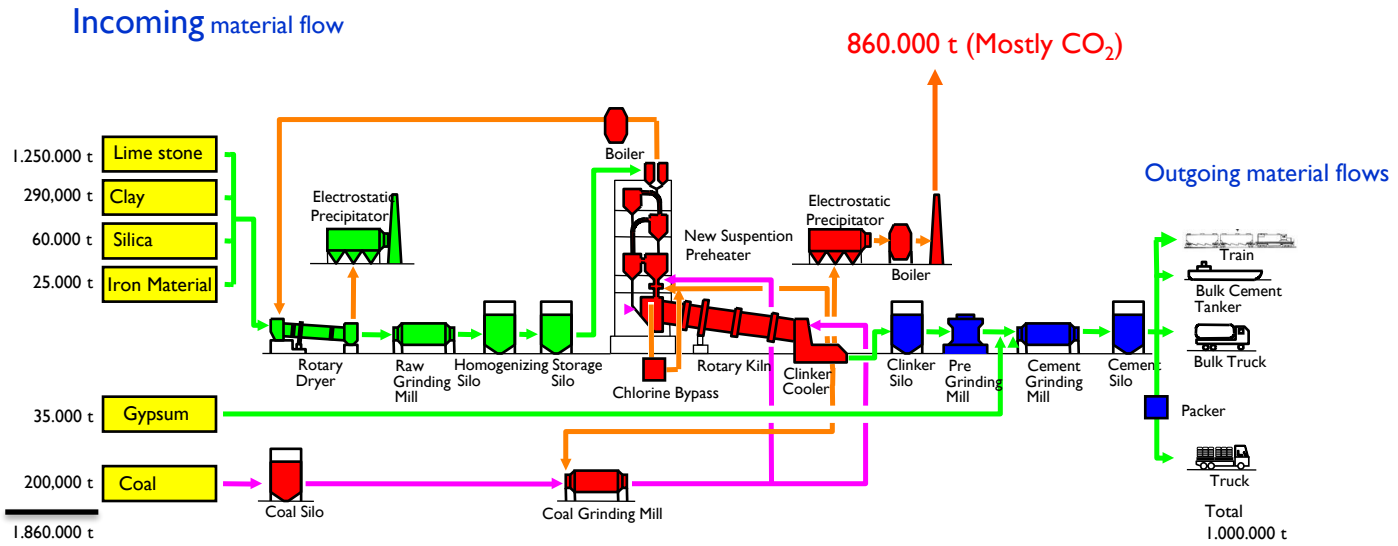
Process flow and material volumes for a 1 mtpa integrated cement plant producing regular OPC



A fully integrated cement plant includes a raw materials treatment section, a pyro processing section and a grinding section. It has a high capital cost per ton of production capacity and has to operate 24/7. Its utilisation factor is of high relevance to its production cost per ton. This slide also shows the large CO_2 volume that is required to produce clinker.

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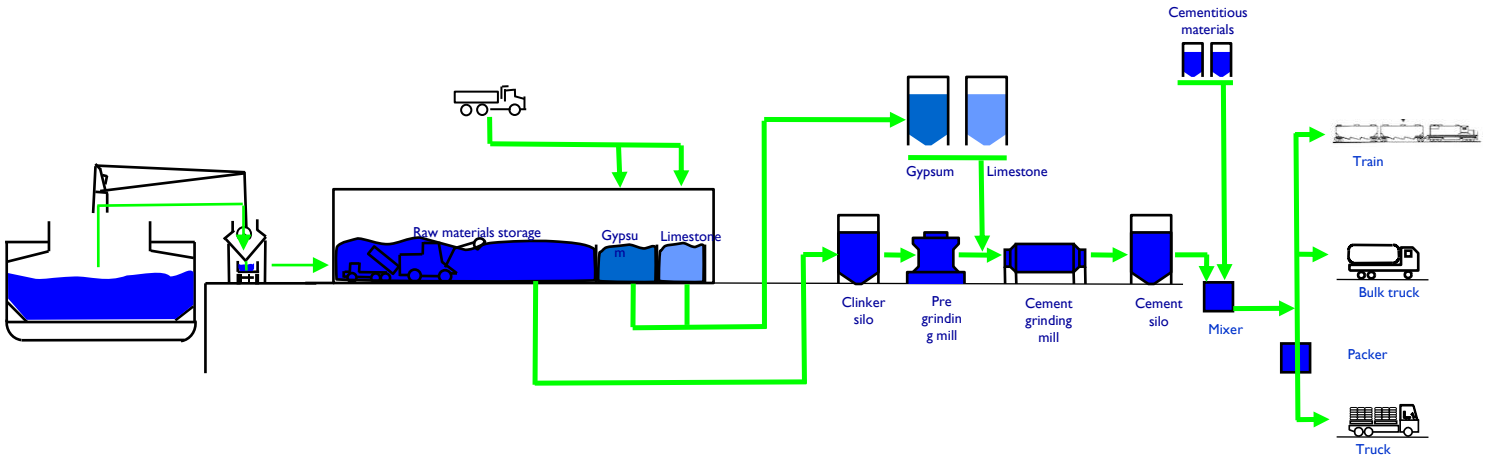
Process flow for a stand-alone grinding plant



A stand-alone grinding plant includes only grinding (and blending) capability. It has a relatively low capital cost per ton and it can be switched on and off based on demand. Its utilisation factor is of much less relevance to its production cost per ton. Grinding plants can reduce the clinker ration per ton of cement by inter-grinding clinker with gypsum and limestone and by blending the produced cement with cementitious material.

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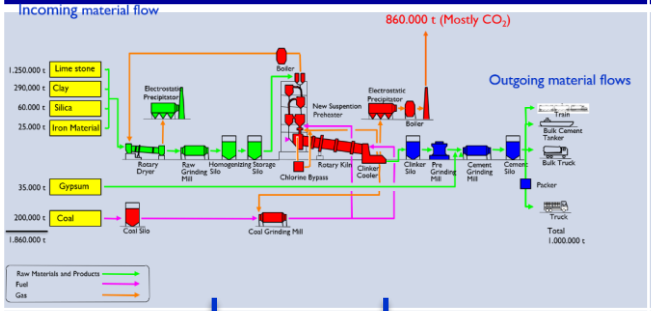
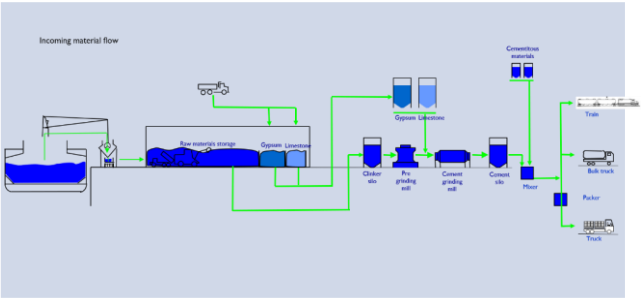
The difference between fully integrated cement plants and stand-alone grinding plants

Fully integrated cement plant	Stand alone grinding plant
	
Raw material pre treatment | Pyro processing | Grinding / blending	Grinding / blending
Capital cost 1 mtpa plant ~ 200 million	Capital cost 1 mtpa plant ~ 40 million
Requires 24/7 operating Operating costs per ton highly dependent on utilisation factor	Can be switched on/off on demand Operating cost very much steady on a per ton basis Operating costs per ton highly dependent on utilisation factor

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What will the future bring?

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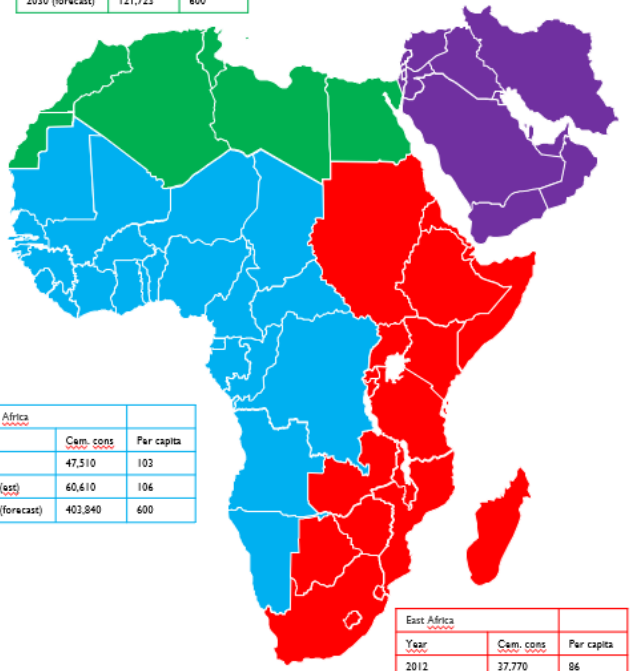
What will the future bring?

North Africa		
Year	Cem. cons	Per capita
2012	101,660	600
2020 (est)	100,760	565
2030 (forecast)	121,723	600

Middle East		
Year	Cem. cons	Per capita
2012	180,570	801
2020 (est)	161,100	655
2030 (forecast)	160,390	600



West Africa		
Year	Cem. cons	Per capita
2012	47,510	103
2020 (est)	60,610	106
2030 (forecast)	403,840	600

East Africa		
Year	Cem. cons	Per capita
2012	37,770	86
2020 (est)	58,240	102
2030 (forecast)	385,600	600

Lets assume that in 2030 all countries have a cement consumption per capita of 600 kg and annual population growth in line with the past ten years.

- For North Africa cement consumption per capita would roughly stay the same and cement consumption growth would be equal to population growth. It is not certain that the area would keep exporting.
- For the Middle East cement consumption would stay about the same. Given current capacity it would remain a large export base.
- Sub Sahara cement consumption will explode. It will be required to build a very significant number of new integrated cement plants to meet this capacity. There will also be more grinding plants, but it is likely that these will receive a growing share of clinker from Africa itself.

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Closing remarks

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Closing remarks

- North Africa and the Middle East are at an entirely different development phase than Sub Sahara Africa. The MENA area ha a current oversupply situation. North Africa still has potential for growing cement consumption. For the Middle East, as a whole, this is questionable. Demand for oil and gas looks to have peaked. Although some ME countries will be able to increase their cement consumption from current low levels, there are other countries that might see a slowdown from their current very high levels. The Middle East looks set to remain an export based. North Africa's export future is less certain.

- Sub Sahara Africa has enormous growth potential starting with a low cement consumption per capita that is increasing and a very large forecasted population growth and urbanisation. There is no doubt that, even with the current overcapacity situation, new integrated cement plants and grinding plants will have to be build. When this growth materialises. Clinker imports are set to increase. Bagged cement imports wild decrease further. Bulk cement trade focusses on the Islands in the Atlantic and Indian Ocean but will play almost no role on the African mainland.

- It is expected that a larger share of the current clinker imports will be sourced from within Africa. When new integrated plants are built, export capacity should be considered as part of the business model. More clinker export bases will be required.

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Introduction

Cement Distribution Consultants - an introduction

Market knowledge

- 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.
- 38 Years experience.

Consulting

- The ability to advise customers on every aspect of cement and clinker trade and distribution including strategical, economical, logistical, technical and operational aspects as well as sourcing, shipping, facilities, handling systems, etc., etc.
- 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 the two largest cement terminals in the world, various other import facilities and self-discharging ship design.

Project / interim management

- Substantial experience in realising projects and managing complete logistical chains.
- Examples:
  - Setting up and managing the cement and fly ash supply to a large construction project including self-discharging cement carriers, floating terminal, etc.
  - Redevelopment of a large brown field bulk terminal.
  - Setting up a fly ash import operating
  - Resolving operational and managerial problems of a grinding facility.

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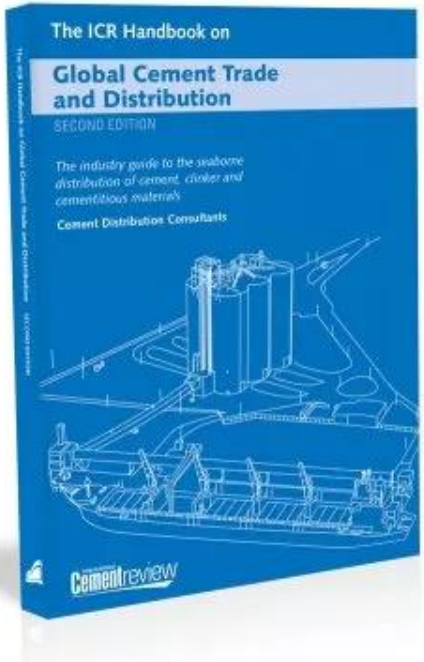

To be published 3Q 2021!

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THANK YOU !

CEMENT DISTRIBUTION CONSULTANTS 20 1999 - 2019