Creating Value

1 Favourable procurement of plants

Dangote Cement's process of creating shareholder value starts before our plants are even opened.

Our size and the scale of our ambition enables us to negotiate the building of not just one factory but several, using the same design from the same manufacturer. Furthermore, our plants are created with a high degree of prefabrication to help reduce our construction costs.

The capacity expansion we announced in September 2015 was evidence that we were able to drive very attractive terms from our key contractor, Sinoma, of China.

As a result we will be able to build new capacities at significantly less than $200 per tonne, thus increasing the potential returns on our investments as soon as they begin operating. In addition, we were able to negotiate an attractive payment schedule that allows us to pay some of the building costs after the plants have opened.

In addition, some of the new projects we announced were expansions of existing factories, for example in Senegal and Ethiopia, where mines already exist and where little or no new infrastructure will be required. By adopting this 'brownfield' strategy we can increase the returns of these factories even beyond the savings we have achieved by our strategy of ordering several factories of a standard design from the same contractor.

2 Careful market selection

A key factor in our selection of potential markets is the competitive landscape, particularly the age and size of plants already operating in the market. In markets where incumbents are operating older, smaller plants, we have an advantage in deploying larger, more efficient and more modern plants.

This is noticeably true in South Africa and Ethiopia. In the former, the average age of plants is about 30 years old and so our more modern facilities will compete on lower costs of production. In Ethiopia, while there are some 16 operators in the country, the fact is that more than half operate sub-scale plants (<0.5Mta) that use last-generation vertical kilns, which cannot produce the highest quality types of cement. Moreover, a large proportion of these are distant from main demand centres. By comparison, our 2.5Mta factory at Mugher can produce higher quality cement in much larger, more efficient quantities and dispatch it to the main demand centre of Addis Ababa less than 90km away.

In practice, we can make a higher-quality, stronger brand of cement at lower cost that our competitors, and sell it at the same price as their own offerings, giving us an advantage in the market.

Another key focus of value creation through careful market selection is to open factories in countries that will incentivise us to be there. Indeed, most countries have welcomed us with generous tax incentives because they recognise our ability to create economic growth, increase employment and provide competition. In many countries we will helping the local economy towards self-sufficiency in cement.

3 Larger, more efficient plants

Our smallest plant size is 1.5Mta, which would be considered relatively large by even global standards, where 1Mta would be considered an average-sized plant. In Nigeria we operate very large scale plants at Obajana (13.25Mta) and Ibese (12.0Mta), which deliver substantial economies of scale, when compared with operating the same capacity across different sites. Furthermore, a single 3Mta production line will operate much more efficiently than three lines of 1Mta each. As a result of building these larger-sized lines and plants, we achieve good economies of scale.

4 New quarries, easier mining

When we open a new plant we of course start with a new quarry and it is here that our competitive advantage begins in the cement production process at our integrated factories.

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Mining new quarries enables us to extract high-quality limestone close to the surface, enabling savings on our mining costs compared with operators whose mines are often more than 20 years old and where good-quality limestone is more difficult and more costly to extract.

5 Larger, more efficient kilns

Our kilns are the heart of our production process and the place where the raw materials of limestone, laterite and other minerals are turned into clinker in a heat-intensive process known as sintering. That the sintering reaction takes place at 1,450C is an indication of how energy intensive the process is. In fact, a large proportion of our costs is spent on fuel for our kilns.

At Dangote Cement we use large, modern rotary kilns equipped with 'pre-heaters' that use exhaust gases from the kiln to heat raw materials as they pass down the pre-heater tower to the kiln.

Using these modern heat recycling systems in this way, we can heat the raw material to about 900C before it enters the kiln, thus reducing its time in the kiln itself and the amount of fuel used to convert it into clinker.

This is good for costs and also good for the environment because of the lower carbon emissions involved in the production of our cement.

Although horizontal dry rotary kilns are the norm on new plants nowadays, some older factories user vertical kilns, particularly in Ethiopia. The disadvantage of these older technologies is that they are more expensive to run, consume more energy per tonne of clinker created, require more staff and cannot produce the higher-quality load-bearing cements required by growth economies.

6 Cost-effective fuel strategy

Although most of our plants across Africa will use coal as the primary kiln fuel, in Nigeria we enjoy considerable advantages in using natural gas at our largest plants.

For the past few years, gas has been by far the cheapest source of fuel per tonne of clinker, when compared with the LPFO we had been using as a back-up at Obajana and Ibese, and as the primary fuel at Gboko.

Using gas in Nigeria is possible because the country, especially the South, has ample gas supplies. We therefore have advantages even in Nigeria where some plants (including Gboko) are too far from gas distribution pipelines.

Late in 2014 and through 2015 we built coal milling facilities at all our plants to eliminate their dependence on LPFO. As a result, although our gas supply was good in 2015, we were able to cut the cost of using back-up fuel during periods when the gas supply

was reduced. Whereas LPFO is about three times more expensive than gas per tonne of clinker produced, imported coal is currently only 10%-20% more expensive.

In the medium term we plan to mine our own coal from sites near to our Obajana and Gboko plants. This locally mined coal will be cheaper than gas, enabling us to reduce the cost of a major input even further when we use coal as a primary kiln fuel across all our plants in Nigeria.

In almost all countries we have built our own power plants to ensure the security of our power supplies.

7 Strong focus on quality

Our plants are equipped with the latest quality control systems that ensure the excellence of the final product right from the quarry to the final cement grinders.

Our quality control begins after limestone has been crushed at the quarry, with the raw materials being scanned in real time by our gamma ray analysers to ensure a consistent and high quality mix that is then conveyed to mixing sheds at the main production line for homogenising.

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In the process line itself, we have systems that take samples from many different points of the process, delivering them automatically to the on-site 'RoboLab' for analysis.

8 Good emissions control

Our factories are designed to perform at better than European requirements to restrict emission levels, in terms of dust, noise and other forms of pollution.

We believe that many African countries will tighten up their environmental legislation in a way that will force less environmentally friendly operators to either invest in improvements or to retire old and inefficient capacity that cannot comply with such strict environmental regulations on the control of dust and emissions from the plant.

9 Finer grinding, better cement

All our plants are designed with the latest vertical rolling mill (VRM) technology to grind clinker and other additives into the final product of cement.

Compared with legacy horizontal ball mills that are still common in Africa, VRMs enable us to grind a finer, stronger and more rapid-setting product than is achievable with the older technology. Stronger and more rapid-setting cements are increasingly in demand across Africa as building sizes increase and speed of construction becomes paramount.

10 Automated loading

Our factories are built with the latest automated cement bag loading systems, such as the one pictured (right). These enable trucks to be loaded quickly and efficiently and thereby increase the number of trucks we can load in any given period.

For obvious reasons, especially for customers who pick up our cement at the factory, automated bag loading is popular alternative to manual loading, in which up to eight hundred 50kg cement bags would have to be loaded by hand.

11 Superior distribution

Our size and financial strength enables us to procure large numbers of trucks to distribute our product to the market. In addition, we are equipping our trucks to use Liquid Petroleum Gas (LPG) as a cheaper and more secure alternative to diesel.

We believe that many customers will prefer the direct-delivery strategy model we already operate in Nigeria, for its convenience and competitive cost. Apart from our own distribution capabilities, we will also partner with key third-party distributors whose scale and reach are a beneficial addition to our own efforts.