



Interview by Peter Edwards, Global Cement Magazine

Plant report: BIGBOSS Cement, Philippines

Global Cement speaks to BIGBOSS Cement's Ishmael Ordóñez about the company's background, its unusual production process and local market conditions, with a focus on its recently-commissioned Gebr. Pfeiffer ready2grind modular grinding system.



Above: Ishmael Ordóñez is Senior Vice President for Administration at BIGBOSS Cement. He joined the company in 2017. He was previously also responsible for operations, including the project to construct the company's plant in Porac. Prior to BIGBOSS Cement, he worked in the beverage and pharmaceutical sectors and, most recently, as Chief Administration Officer for International Care Ministries, a non-governmental organisation that cares for the poorest in Filipino society.

Global Cement (GC): Please could you introduce BIGBOSS Cement?

Ishmael Ordóñez (IO): BIGBOSS Cement is a 100% Filipino-owned producer of cementitious materials that was established in 2017. It was named after the ultimate Big Boss, God Almighty, and is dedicated to carrying out the work of Jesus Christ on Earth. The major shareholder is Henry Sy Jr.

GC: Can you expand on the founding and development of the company?

IO: Henry Sy Jr. is co-vice chairman of SM Investments, a major conglomerate in the Philippines. He also serves as chairman of SM Prime, the group's property arm, which has interests in malls, residences, offices, hotels and convention centres. Due to the continued strong demand for such facilities in the Philippines, he decided to develop captive cement production capacity. BIGBOSS Cement is the result of that dream.

The plant itself is located in Porac, in Pampanga, Luzon. It is around 100km north of Manila, the capital of the Philippines, in the north of the country. It uses an unusual production process that makes use of a volcanic material, lahar, which resulted from a major eruption of the nearby Mount Pinatubo in 1991. The lahar is a very siliceous material that is found at the surface in a 25m-thick layer. It extends for many square kilometres in the area surrounding the plant. The lahar is the primary ingredient for BIGBOSS' cement. It is mainly SiO₂ and, if you analyse it using X-ray diffraction (XRD) it bears a strong resemblance to cement clinker. However, as it lies in the ground, the lahar is not activated. This is why our President and key innovator, Eng. Gilbert Cruz, developed a patent-pending process that activates this material, turning it cementitious.

GC: How does the BIGBOSS process differ from conventional cement production?



Right: The crater lake at the top of Mount Pinatubo. The volcano, which erupted in 1991, is a source of lahar, the main raw material used by BIGBOSS Cement.



Left: Construction of the ready2grind mill at the BIGBOSS Cement plant in Porac in mid November 2020.

IO: You can think of the BIGBOSS Cement plant as being somewhere between a conventional integrated facility and a grinding plant. This is because there is a low-temperature heating step. In this patent-pending process, the lahar is heated to above 200°C in a diesel-fired chamber. This activates the material, converting it to what we term Granulated Activated Sand by Heating (G ASH).

The G ASH, plus some imported clinker, gypsum, limestone and slag, are then ground in our three mills. There are two ball mills from a Chinese

supplier. These have a shared capacity of 110t/hr and came online in 2018 and 2019 respectively. The third is a 70t/hr modular ready2grind vertical roller mill from Gebr. Pfeiffer, which was commissioned in December 2020. These three mills combine to produce around 4320t/day (1.4Mt/yr) of low-clinker cement.

GC: How do you distribute these products?



Left: Map of the Philippines, with Manila, Batangas and BIGBOSS Cement plant shown. Pampanga Province is highlighted.

Far left: Lahar mud flow in the immediate vicinity of Mount Pinatubo.



Above: The ready2grind system comes largely pre-assembled, resulting in lower installation times.

IO: We have two bagging lines, a Chinese one for the two Chinese mills and a Haver & Boecker line for the ready2grind mill. They pack the products into 40kg bags, which are sold to hardware stores via our sales team and a network of dealers. This is how we have chosen to enter the market. We are helped by the green credentials of our products, which emit around half the CO₂ per tonne as conventional cement products.

With the resources at his disposal, Henry Sy Jr. could have simply bought another cement producer. There have been plenty of opportunities to do so in the Philippines recently. However, he was looking to enter a niche, while also doing some good. Indeed, our company motto is 'Green is Good.' The less clinker the better.

GC: Why did BIGBOSS decide to change supplier for the third mill?

IO: When we decided to expand the plant, we also wanted to 'level up.' Gebr. Pfeiffer is a long-standing company in the cement mill business, with an incredible history and reference list. It dealt with us directly, not via a third party and shared our enthusiasm to develop the Philippines.

The ready2grind modular mill concept was chosen due to its short construction time. We had estimated that the new mill would be commissioned within eight months of the start of civil works, but restrictions surrounding the Covid-19 pandemic ultimately extended this to around 12 months.

GC: How did the project unfold?

IO: The contract was signed in mid 2019 and civil works started in early 2020. The machinery was installed in mid 2020 and cold commissioning began in October 2020. Hot commissioning took place in late November 2020 and the ready2grind mill was fully up and running in early December 2020.

As I mentioned, there were some delays due to the pandemic. However, we were still able to receive parts during the spring and summer as the government classified projects such as this as 'essential.'

GC: Were there any issues during commissioning and how were they overcome?

IO: The inability for Gebr. Pfeiffer's experts to travel between Europe and the Philippines was a major reason for the delays I mentioned in my answer above. BIGBOSS and its local partners had to undertake parts of the project with Gebr. Pfeiffer assisting from a distance. Online meetings have been a big help in this regard. A lot of pictures were sent back and forth to Germany.

In late November 2020, Gebr. Pfeiffer's team were finally able to travel to the Philippines to assist with final commissioning and start-up. We are grateful for a fruitful collaboration and were able to keep going with the project during a difficult period.

GC: What are the differences between grinding G ASH with a ball mill compared to a vertical roller mill?

IO: We grind our products to a fineness of around 4200cm²/g according to Blaine. However, the G ASH is easier to grind than clinker. In a ball mill this means that the different components have a tendency to separate as they progress through the mill.

However, due to the nature of a vertical roller mill, this effect is significantly diminished. We worked closely with Gebr. Pfeiffer to ensure that we developed a mill that was capable of 70t/hr.

GC: What's next for BIGBOSS Cement?

IO: BIGBOSS has plans to enter the bulk distribution market, either via packing in Big Bags or via bulk road tankers. The silos and systems are in place, as this has always been part of our long-term plan. However, to enter the bulk sector, we need to optimise our formulation to achieve a higher compressive strength. The bagged formulations currently reach 24-28MPa after 28 days. To be used in bulk projects, we need to achieve more than 40MPa. It is something we are working on right now.

We are also thinking about the next plant(s). Manila is a good source of customers and so we are looking to cover the market to the south, around Batangas. We are also looking at locations for plants further north in Luzon. We will very strongly consider Gebr. Pfeiffer as a supplier for these plants. Beyond this, we have longer-term plans to build plants in the Visayas and Mindanao regions, in central and southern Philippines respectively.



Right: BIGBOSS Cement commissioned its two Chinese-made ball mills in 2018 and 2019.



GC: Would these plants also be based on the G ASH process?

IO: We would again intend to use volcanic residues as the main raw material at any future plant. These are available in many locations within the Philippines due to the high levels of volcanic activity.

GC: Is the Philippines still *Build Build Building*?

IO: The government's *Build Build Build* programme was hampered by the Covid-19 pandemic in 2020. However, there is a strong underlying drive for major new roads and infrastructure projects, housing developments and so on, with some improvement in the market since September 2020. This is thanks to the adoption of new working protocols, which have enabled a return to some kind of normality. Construction workers are now tested for Covid-19 and wear PPE on site, for example.

GC: How have sales changed since the plant was established?

IO: The plant only began to sell products at the end of 2018, so there has only been one full 'normal' year in the history of the company - 2019. Obviously, construction work was limited at points during 2020 due to limits on the number of workers allowed on worksites.

GC: How was production at the plant affected?

IO: Parts of 2020 were very difficult. We were forced to close the plant for a period in March and April due to a government mandate. However, we successfully put forward a case to grind our remaining clinker stocks, which otherwise would have spoiled. This was done using a skeleton staff.

We also had to lockdown the plant. During this period, the plant was in operation but nobody could enter or leave. Of our 200 staff, 100 were on site and 100 were off site. We provided necessary provisions, accommodation and a hardship allowance to those

on site and a retention allowance to those not able to work. The corporate team was able to work from home in most cases, with the occasional visit to our head office in Manila.

GC: What are the biggest future challenges for BIGBOSS Cement?

IO: We are somewhat reliant on imported raw material costs, particularly clinker. It is possible that these could rise in the future. That said, we could adapt our blend to use no clinker. The resulting product would be able to meet the same strength as we do at present. However, it would not be classified as a commonly recognised cement blend, which might represent a commercial downside. As the user of a captive bunker-fuel-fired power plant, we are also exposed to changes in international prices.

Imported cement, mainly from China and Vietnam, is also a threat to some extent. The market needs this imported material at present, and so as long as the government maintains appropriate import tariffs, importers will continue to complement, rather than threaten domestic producers.

GC: What is the biggest opportunity for the company?

IO: BIGBOSS Cement has huge potential to expand to other areas of the country. On top of the government's *Build Build Build* programme, there is rising cement demand from the 105 million people that call the Philippines home. Small housing projects, schools, hospitals and commercial spaces are all required, which will benefit all cement producers. As a young and green producer of cementitious products, BIGBOSS Cement is well positioned to leverage existing trends to expand rapidly in the coming years.

GC: Thank you. We look forward to following BIGBOSS Cement as it grows.

IO: You are very welcome indeed.

