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Welcome to the November 2019 issue of Global Cement Magazine - the world's most widely-read cement magazine! This issue will be distributed at the 24th Arab-International Cement Conference & Exhibition in Cairo. Our associated review of the Middle Eastern cement sector can be found on Page 76, with a full run-down of exhibitors on Page 74. This November issue will also head to Atlanta, US, for the 38th International Cement Seminar, which returns after a lengthy absence. If you are at either event, or indeed lucky enough to be heading to both over this very busy conference season, come and say 'Hi!' Global Cement will be on stand H3 in Cairo and stand 116 in Atlanta.

Elsewhere, this issue is packed with expert features, technical articles and all of the latest news from around the sector, including a review of another industry event, the highly successful 36th FICEM Technical Congress in the Dominican Republic (Page 54). There's also an in-depth interview with the manager of the Cemex San Pedro de Macorís plant, which Global Cement visited on the day after the main FICEM event (Page 62). The most modern in the Caribbean, the San Pedro plant has a unique Cemex-designed preheater cyclone arrangement to accommodate changes between the wet and dry seasons, as well as many highly skilled and motivated staff. Their passion was clear to see, with great attention paid to health and safety, process efficiency and communication with the press. The last of these is the subject of the second instalment in our PR 101 series from Mary Beth Kramer, which starts on Page 14. Our features also include James Pope's take on the management skills needed in the future (Page 12) and an interview with Silicon Valley AI start-up Atollogy (Page 18). Other technical contributions are on the topics of kiln optimisation (Page 24), alternative fuels (Page 30), dust mitigation (Page 38), refractories (Page 36), waste heat recovery

(Page 34) and material analysis (Page 40).

Peter Edwards Editor



your travels!



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James Pope, Beaumont Bailey

Managing the machine: Leadership and automation

What skills will cement industry leaders need in the future...?



Above: James Pope, one of the co-founders of Beaumont Bailey, is an executive headhunter specialised in placing board level, senior functional, country and cluster leadership across the building materials industries, with a particular focus on cement.

Below: The cement plant managers of tomorrow will be unable to act autocratically. Instead they will have to rely on reports and opinions from across their leadership teams. The potential impact of automation in manufacturing is well documented. Rapid advances in robotics and machine learning are enabling factories to produce more than ever before at a higher standard and with less need for human intervention. A recent study by McKinsey revealed that 478 billion of the 749 billion hours spent on manufacturing globally could be quite easily automated using existing technology. This is the equivalent of 372 million full-time employees that could either be repurposed or removed from the global manufacturing secor.

With this seemingly inevitable change gathering momentum, Beaumont Bailey has been working with the global building materials community on the changing role of leadership in manufacturing, and what current and future leaders need to do to make themselves indispensable in the new age. In addition, it has looked at the whether the characteristics that have traditionally been prized in senior leaders are still valuable today.

When we reflect on leadership in the cement industry in recent decades, a caricature is conjured up of a quintessential leader. An omnipotent and, at times, autocratic manager who has the final say in most major decisions. Typically male, they have been involved in the cement industry for their entire career, progressing through the management trainee programme before being moved quickly into a leadership role, usually in a challenging emerging market.



Their leadership and communication style has been shaped by the challenging environments in which they have operated. As a result, they can be fairly direct and candid in giving instruction or feedback. Disagreements are often settled through robust exchanges. They tend to surround themselves with other 'type-A' personalities. Their successes and credibility is based on their intricate knowledge of the cement manufacturing lifecycle, with a depth of technical as well as operational and commercial knowledge.

While this is a somewhat extreme illustration, I don't think it is unfair to suggest that businesses right across the industrial manufacturing landscape have valued some or all of these traits in their leaders in decades past. Evidence also suggests that this type of leader has historically been very effective in the cement industry, particularly when managing large industrial labour forces.

In the evolving world of automated manufacturing, cement plants will increasingly have a much smaller but much more highly skilled workforce, and a manufacturing process that is more complex than today. How will leaders need to evolve to facilitate success in the new world of cement manufacturing?

Tomorrow's cement plant will require a highly diverse leadership team made up of subject matter experts in a variety of functions. No longer will a single leader be able to possess enough knowledge of each of the functional areas to run the business from the top down. Instead, accountability will be distributed much more evenly across functional and business line heads.

Machine learning and artificial intelligence (AI) will pre-empt technical issues that previously took up significant management time. This will reduce the need for extensive technical or operational expertise across the leadership team. Instead, one technical director will be able to do the work of an entire technical department. Maintenance activities could potentially be entirely outsourced to equipment manufacturers. At the same time, maintenance will shift from being reactive to proactive, with sensors in the plant and machinery enabling repairs to be completed long before production is affected.

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What this all means for senior leadership is that the need for industry-specific operational experience at a senior level will decrease and less value will be placed on first-hand operational and technical knowledge. Instead, emotional intelligence, commercial acumen and strategic ability will be highly prized assets so that leaders can get the best out of the team and possess the agility in thinking to capitalise commercially on the shifting business landscape. This could potentially enable the cement industry to draw on skills from outside the sector.

Emotional intelligence is essential for team effectiveness and, with a smaller workforce that has much more accountability, their effectiveness will become ever more crucial. Strong emotional intelligence skills also give leaders the ability to better empathise and identify potential in others, an essential skill when it comes to recruiting and promoting talent. With a smaller pool of talent at each rung of the organisation, effective hiring and talent management will be pivotal in the success of organisations.

In addition, emotional intelligence gives leaders the ability to leverage the traits that make us human, like compassion or motivation. To use a sporting analogy, AI and statistical analysis might help us to build a sports team, but it is hard to see it replacing the coach.

Another thing that computing and AI has not given us (yet) is the ability to formulate creative strategies. The vision to take business in bold new directions remains the domain of great leaders. A strong strategic vision will set leaders apart in the cement plants of tomorrow.

With knowledge and expertise being dispersed far more widely across the senior leadership team, managers will have to rely far more on the opinions and views of their team members when formulating plans. Consensus and collaboration with teams will be far more effective than decisive action based potentially on out-of-date experience.

So, what can current and future leader do to ensure they are ready for the manufacturing industries of tomorrow? Firstly, and perhaps most crucially, it is to develop their emotional intelligence, best learned through self-awareness and diverse cultural experience. Secondly, it is to improve business and commercial skills by engaging more widely in the business world. Thidly, it is to become a highly effective facilitator of the talent around them. This will create environments and cultures that remove barriers and enable those with diverse backgrounds and skills sets to operate at their best for the plant.



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Mary Beth Kramer, Kramer Consulting

PR101: External messages and the press

In the second part of her PR101 series, Mary Beth Kramer asks: How can cement producers build sustainable and beneficial relationships with media outlets?



Above: Mary Beth Kramer is the President and Owner of Kramer Consulting. For over 15 years, Kramer Consulting has represented clients from the building materials sector, including Roanoke Cement, Titan America LLC, Oldcastle Materials and the American Concrete Pipe Association.

Below: Facing the media can be daunting but it doesn't have to be. A considered approach can reap a number of benefits for cement plants. L ife in a cement plant can be hectic. There is Inot always time to ponder the various ways to communicate and the best tools to accomplish that goal. Sometimes management is reduced to literally shouting at workers over the din of heavy machinery, a rudimentary example of communication on the fly!

But when communicating with parties from outside the plant, communication should never be on the fly. A range of communication styles must be used to suit different contexts, from the non-stop intensity of manufacturing to explaining longer range, yet equally important, initiatives like environmental stewardship.¹ A plan to communicate effectively with those outside the plant is essential. How we manufacture cement is of interest to a wide range of audiences and for different reasons. These require thoughtful explanation and communication. 'No comment' isn't an option.

Communication best practice

Best practice cement plant communication must be focused and tactical. It allows day to day production to maintain priority and, crucially, proceeds without anxiety and/or loss of goodwill. If done correctly, a 'boilerplate' communication plan can be created for plant employees to understand and work from. Let's look at how one is constructed.



First, we need to form a communication team. Ideally, there there will be one single communications leader, either an external PR person/agency or a plant communication specialist. If your plant is part of a larger organisation, then a representative from the corporate office, for example, a corporate communications director, should be included to secure approvals from higher levels of the management chain. The local plant manager is on the team to create and oversee the plan, but in reality (s)he may have relatively little time to dedicate to actual planning. They are, however, often the plant's main spokesperson.

Within the team, I suggest designating three articulate speakers who can step in to communicate externally at any given time. I have worked with production managers, environmental managers, other engineers, plant managers, vice presidents, presidents and even CEOs who have all confidently stepped into this role. With sufficient notice and a short training session, most people can handle this task. Of course, not everyone is up for it. Beware of forcing the role on those that feel uncomfortable.

Media training is strongly advised for all potential spokespeople. Once they are trained, external communication can be entrusted to any of them. At a minimum, they should all know the plant's particulars and current iniatives and be comfortable relaying them. When external messages are handled correctly, they will overlap with internal communications, becoming an integral part of the plant's normal communication activities.

The tools

Now that the team has been assembled, a first meeting can be arranged. The agenda should include discussion about the primary tools used to communicate. These are:

- 1. Fact sheet;
- 2. Historic Timeline;
- 3. Photos of plant / personnel;
- 4. Q&A sheets;
- 5. Talking points;
- 6. Latest press release.

Not surprisingly, the simple task of just writing these things down will provide the communication team with a decent overview of the plant, plus some of the most significant 'evergreen' talking points. Many plants are very well rehearsed in relaying these.

Get your Fact Sheet straight

The answers to the questions in the Fact Sheet represent foundation of the plant's communications tools. Typically a single page long, the Fact Sheet includes:

- 1. Where is the plant situated?
- **2.** Is there anything unique about the site? If so, why is it beneficial for the plant?
- 3. From where are its resources drawn?
- **4.** How large is the plant? What percentage of the site is dedicated to production?
- 5. What kinds of cement does it produce?
- 6. How much cement is made every day / year?
- 7. How many employees work at the plant? Is there union representation?
- **8.** Is the company the largest employer and/or taxpayer in the area?

Provide perspective

Next up, a Historical Timeline of the plant should be created and maintained online. Print copies should also be kept to hand out. It should answer:

- 1. How long has the plant been in existence?
- 2. Has it always made cement?
- 3. Has its name / owner changed over the years?
- **4.** If family owned, what is their background? Where are they from and how did they get into the cement industry?
- **5.** If the plant is owned by a parent company, how many other plants/offices are there and what other products are produced?

A picture paints a thousand words

Good visuals of the plant are priceless. Photos and videos can be used in various ways to communicate information about the plant, including accompanying press releases, websites, newsletters, social media posts and presentations. A keen in-house eye and



the latest smart phone can make a great impression in this regard. Alternatively, hiring a local photographer can be one of the best investments a cement plant ever makes. High quality images of the plant, as well as relatable images of those employed there, can reap benefits over many years.

Q&A Sheets

Q&A Sheets are valuable when dealing with a complicated issue, for example, a quarry expansion initiative. The communication team can anticipate what reporters might ask, thereby directing attention and shaping any investigation. After adequate planning, the communication team will draft the answers to the likely questions and run them up the ladder for management approval. The legal team provides oversight. Questions in this example might include: *Why do you need to expand? How large is the expansion? How will you mitigate any expansion impacts?*

Putting it all together: A Press Kit

The four components discussed so far: Fact sheet, Historical Timeline, Photos and Q&A sheets combine with the the latest Press Release (covering the latest news) to form the basis of a Press Kit. There are some other elements. For example, Talking Points are an important communication tool but they are only for use by the spokesperson. They should not be released to a reporter under any circumstances.

The Press Kit should be assembled ahead of time. Having one available reduces the potential for panic in time-critical situations. Indeed, it can buy a communicator invaluable time.

Reach out: Start local

Once a Press Kit has been assembled and the communication team is all on the same page, the plant can reach to reach out to a reporter. Always start locally. Regardless of how small the paper is, don't leapfrog over it to a larger outlet first. Reporters Above: The LafargeHolcim Exshaw plant in Alberta, Canada is located between the Rocky Mountains and the Bow River. Some plants are in unique locations that will make a lasting impression in press releases and other communications material. Source: Lafarge Canada.



Right: The plant's Press Kit should be maintained and updated regularly, for access at a moment's notice. have feelings too and you *will* need their help in the future. Indeed, the closer the outlet, the more important they are. They speak directly to your most important audience, your nextdoor neighbours!

The first contact with the reporter could be via phone call, a meeting over coffee, or just an email sending the latest press release. There may well be a reporter assigned to business or manufacturing at the local paper. Do your homework and make sure you identify the right person.

By now, the plant should have enough talking points to navigate a short meeting, email discussion or phone call. Introduce yourself, explaining that you are the contact for the plant if there is ever a question. Reporters love resources. Let them know that you have a press release you can send over with some recent news. Might they be interested in running a story?

It is important at this point to point out that public relations is not an exact science. It can be as variable as making a new friend. What does a reporter considered newsworthy? This will vary, but any number of topics can be suggested: Plant tours, environmental initiatives, expansion at the plant, capital investments, unique employees, philanthropy or volunteerism, local education initiatives, the list goes on.

The first year

A plant could easily send out 6-8 press releases in the first year of its press relations strategy. One by one, the releases they can be 'planted' to 'reap' an article after a few have been sent out and read. Regular communication benefits both parties. A relationship becomes established, transparency is created and goodwill is formed.

Handling the media on-site

Do not invite reporters to the plant without a plan. Our cement plants must look their best when we





have company. A clean and orderly plant will result in clean and orderly pictures in the local paper.

Reporters and photographers should always be attended on campus. Keep them on a schedule, with appropriate communicators to meet. Then, escort them off the plant campus. While doing so, ask them when they plan to run the piece.

Letting reporters know about potential stories ahead of time is called 'pitching.' Pitch article ideas to just one single reporter. Expect them to do their homework. If there are violations or controversies of any kind, they will ask questions. Be prepared!

When communicating with reporters, be mindful that no conversation is ever truly 'off the record.' It may not be printed, but things said 'off the record' will inform a reporter's opinion of the plant and company, possibly affecting future coverage from their outlet.

And finally...

Once you obtain a print copy of the article, consider how it can be used to the plant's advantage. If it is positive, order reprints and feature it in the foyer or entrance to the plant. Copies can be dis-

> seminated at events, included in future presentations, sales promotions, award submissions and as general corporate marketing material. Remember, relationships with the media, when handled correctly, can bring cement plants great benefits. Indeed, they are essential. It is up to the plant to take the initiative and start the conversation!

References

 Kramer, M-B; 'PR101: Building local relationships' in Global Cement Magazine - October 2019 edition, September 2019, Pro Global Media Ltd, Epsom, UK.

Right: If coverage is positive... maximise it! Get some copies for your plant reception, future conferences and meetings, award submissions and other corporate uses.



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Interview by David Perilli, Global Cement Magazine

Atollogy: Visualising plant logistics

Silicon Valley start-up Atollogy has developed a range of image recognition algorithms that offer cement plants advantages in terms of customer experience, health and safety and optimisation. David Perilli spoke to Atollogy to find out more...

Global Cement (GC): Please introduce Atollogy.

Damian Murphy (Member of Industry Advisor Board) (DM): Atollogy was founded in March 2017. The name is taken from Atolls in the Pacific, the idea being that we connect islands of information by digitising operations. The company has undergone rapid growth in a short space of time and markets around 800 devices in the field of logistics and automation. It has around 25-30 sites across a range of manufacturing industries, including cement.

As a new digitisation company, Atollogy wanted to help some more 'traditional' industries to digitise their operations, particularly with regard to customer experience. Many Internet-of-Things (IoT) solutions are fairly intrusive and can take months to implement. By contrast Atollogy's solutions are quick to install and can be deployed in many areas of the plant.

GC: Why is Atollogy's solution different?

Joseph Farhat (Head of Innovation and Customer

Success) (JF): Atollogy's solution analyses visual data, using cameras, typically 5-25 of them on any given site. You can extract so much data out of digital images via a range of different algorithms. They may seem low tech in the modern world of



GPS, Bluetooth and Radio Frequency Identification (RFID) sensors, but camera-based systems are much more adaptable. The cameras themselves are nothing unusual. It's the algorithms behind the cameras and neural network that do the hard work.

GC: But the other technologies provide data that cameras don't. Can you comment on that?

JF: It's true that these systems have some capabilities that visual systems don't, for example off-site tracking by GPS. However, RFID, as the main direct competing technology for Atollogy's systems, has a major drawback: Its capture rate. The sensor has to be right under the gateway with a straight line of sight. For a cement plant the investment cost of RFID roll-out is also fairly high and the adaptability is limited. As well as putting chips in all of its own vehicles, RFID chips have to be installed in all customers' and suppliers' vehicles too, at fairly significant cost. Even in the best-case scenarios the capture rate is only 30%.

GC: How does camera performance vary in darkness, rain or snow?

JF: We have not seen any problems with rain, snow or indeed hot weather. We have an installation in Dubai that baked in >40°C heat all summer and another in Canada that endured -30°C blizzards. Both performed strongly in terms of camera performance and the system as a whole was totally robust. The only camera lost so far was when someone drove into it! With respect to darkness, we have infrared capabilities. However, in the vast majority of cases, our cameras are installed in places where people are in close proximity to vehicles. Most already have lights for night-time operations to meet safety requirements. Our cameras can see in those light levels as easily as if it were day.

GC: What facilities does the user need to provide?

JF: Atollogy brings its own tried-and-tested network infrastructure to the site, so the client only needs

Below: Atollogy uses a cameras and visual analysis algorithms to optimise cement logistics and health and safety.



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to supply power. Sometimes that's from the existing network and sometimes, for remote locations, we use solar panels. Data is stored in the Cloud with AWS.

GC: What do cement producers use the technology to do?

DM: Cement sector margins are fairly low and competition is fierce, so customer service is becoming an increasingly important differentiator. What Atollogy does is enable cement producers to extend the 'Uber experience' to their customers.

Our solutions also have benefits in terms of health and safety for everyone on site. For example, a new contractor that is only on site for a month can be recognised by the system without the need (and cost) to install RFID chips in every vehicle that the contractor needs to use on site.

Cameras, and the algorithms behind them, can also be adapted to different targets. For six months, a cement producer might prioritise customer wait times at a particular site. Then, the emphasis may shift to improving health and safety. Another few months pass and there has been a change in the upstream process. Now the management wants to know whether or not it should invest US\$5m in a new silo for cement loadout. Atollogy's solutions can inform that decision-making process.

GC: How do the algorithms do all of this?

JF: The algorithms can detect truck license plates, can tell the difference between people, tractors, trailers and cars and identify different colours. For every vehicle on site, the system generates a digital twin so it can keep track of its movements. Every time the vehicle is detected by the system it updates its records. Think of it like a 'facebook profile' for the vehicle. Every time the vehicle does something, there is a 'status update' in its 'news feed.'



A picture then builds up and it can start to diagnose and highlight problems to a human decision maker. It can tell the operator at that exact moment how many trucks are in the yard and what they are due to receive or unload. Is the wait time acceptable? If not, trucks can be redirected to different silos, the load order can be changed or other actions can be taken to maximise customer experience.

Beyond this, we can look at patterns over longer timeframes. Is a bottleneck a daily event or only on a certain day? Does it only happen when a particular company or driver arrives? Recently, one of our client's customers complained that one of its drivers took two hours to load up. Historically there has been no single source of objective truth that answers: *Why did the driver take two hours*?

Data *can* answer that. Maybe it was down to sheer weight of traffic on a unusually busy Monday. The driver may have been delayed by over-enthusiastic security staff or was even having a nap in the cab. Maybe they were stuck behind a driver that took *three* hours.

With the proper diagnosis from the data, action can be taken. If the root cause was high traffic levels,

Above: In a crowded market, cement companies are increasingly focused on customer experience. Nobody wants to wait for product.

Below: Atollogy's Yard View enables operators to see an overview of each point of interest in their camera network.







Above: The technology is not thrown when reading licence plates in the dark.

the plant could advise customers to avoid certain times. If on-site staff are unwitingly causing delays, there can be optimisation at the cement plant. Maybe there should be a 'gentle nudge' to the driver for sleeping on the job. Maybe the event was a complete one-off and no action need be taken.

GC: What other capabilities are there?

JF: Several of our cameras focus on silos. They can tell not only how long a truck is stationary but see if the driver gets out of the cab. It will be able to see whether the driver is wearing personal protection equipment and whether they put chocks under the wheels or not.

Another case we're seeing with alarming regularity is drivers getting out of the cab when they are unloading raw materials. If the camera detects a person within a stipulated radius of an unloading vehicle, it triggers an alarm. We saw this happening at a site where a person had died because they did not follow this rule. The data supplied is exceedingly valuable in the quest for greater health and safety.

The cameras can also be trained to watch loadout scales. This allows users to properly capture and avoid over- and under-loaded trucks either going out or having to go around the yard again to meet the correct weight. Recently we saw a truck visit a small aggregates plant with a 26 minute turnaround time. The following day the same truck took just 4 minutes. The difference? On the first day 22 minutes were spent on three re-weighs! On one of those, the driver unloaded when the truck was already underweight. The root cause was a language barrier. How much does this kind of problem affect the cement industry? Nobody knows! Now with visual capture and algorithms, Atollogy's clients can identify the amount of time, money and material wasted. Steps can then be taken to avoid it.

GC: How do cement plants handle the vast streams of data generated by Atollogy's algorithms?

JF: The data delivery aspect is via a real-time dash-

board that can be monitored by site staff. Another version operates above that for group-wide activities. This allows senior staff to see which plants are performing well against their baselines and highlight areas for improvement. It allows analysis across the group, to provide synergies and identify opportunities for improvement.

All of the information used by Atollogy's dashboard is also available as a raw database so that the customer can integrate the data into their own existing systems.

GC: Does the system provide advice to operators?

JF: At the moment the algorithms provide data to be acted upon by human operators. Of course, we're working towards prescriptive analysis in the field of cement logistics, where the system will be able to both diagnose issues and act on them. This is already being developed by Atollogy for other applications.

GC: Are there any concerns about algorithms replacing humans?

DM: Not at all. The system adds to human abilities at a time when it's getting harder and harder to find good staff. 'Keeping watch' over an individual silo is not a job at a cement plant. There aren't the people and the job itself would be mind-numbingly dull. What you have with our cameras is a watchman that never sleeps. It keeps a constant eye on safety and only flags dangerous activities to the operator when they occur.

90% of accidents in these kinds of sites are directly down to decisions taken by the individual involved. This system can act as a gentle 'tap on the shoulder' to nudge them away from the danger. There are two ways that this can inform the person in charge. One is a flashing box on the dashboard. Another, which is still being refined, is an email or text. You click on the link and it brings an image of the incident.

GC: Do you have facial recognition capabilities?

DM: This is a frequent question and the answer is 'No.' Atollogy is only interested in the *presence* of an individual, a truck / trailer / car and tracking license plates. As explained above, this is an incredibly powerful combination. There has also been a significant backlash to facial recognition software in use in several countries. We have no intention to be that intrusive to our clients. For some clients we even deliberately obscure the image of individuals, rendering them unrecognisable to even their co-workers.

On a related point, something we learned early on with this kind of system was never to punish anyone using the system. If you do that, the system will be sabotaged and trust will be eroded.

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GC: Can we delve a bit more into the algorithms? How are they developed?

JF: We use a lot of deep learning via TensorFlow to teach the algorithms all the abilities we've already discussed. While you can get many algorithms off-the-shelf these days, it's hard for these to deal with the most difficult cases, for example reading a license plate through a truck window. Atollogy's algorithms can get around such difficulties. We do this by training using the most difficult cases. The algorithm is then very good at handling the unexpected.

GC: How long does installation take on site?

DM: We recently launched a system at one of the largest cement terminals run by a major US cement player. The installation, which looked at seven points of interest, with just one in-house electrician took 11 hours. This case was especially remarkable given that two of the 11 points were supplied with power by dedicated solar units.

Data was gathered within 1 hour of installation after a short adjustment period. Two hours later the algorithms were starting to 'paint a picture' of the site. Within a week there were already six full days of useable results. The client was astonished!

GC: What kind of savings or return on investment are we talking about?

JF: I know it will sound like a 'cop out,' but the value comes from taking decisions based on the data generated. We find that as little as 1-2 months of data is sufficient for operators to take what would previously have been thought of as quite drastic decisions.

The example of the under/overfilled aggregate truck provided very quick savings for that client.

 Image
 Image
 Image
 Image

 Station 1

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Turnaround times have reduced by 10%. Its sales personnel are also being more proactive. They have been able to improve the customer experience, for example by highlighting quieter times. When delays occur, the sales staff know why and can reassure concerned clients that it won't happen again.

Another client spent US\$3m on a new silo and then measured the improvement in its turnaround time. It reduced 'poor' turnaround times as defined by the plant's formula, by 70%.

GC: Are your longest-standing clients still gaining improvement years later?

JF: Our longest-standing users are in the aggregates sector. Some of them have recently experienced customer complaints due to contaminants, for example large boulders. They have responded to these complaints by attaching images of the truck as it leaves the plant to the job electronically so that there can be no debate as to the condition of the load when it left the site. New ideas like these keep coming up.

GC: What happens to the data if the connection between Atollogy's local network and the cloud is disrupted?

JF: There is a backlog capability in the network for up to seven days. We never expect a week-long outage, but the capability is there should it ever be needed. Once any disruption is over, the backlogged data will flow back to the Cloud.

GC: What is Atollogy working on right now?

JF: There are developments in prescriptive analysis that we are pursuing and we also want to 'load up' each cameras so it can do more in any given posi-

tion. We also want to look at more 'hotspots' like the raw material example I provided. Another thing is to optimise and possibly automate security. What happens when a site is shut to customers? Are security staff really necessary all the time? Can we use the existing technology to identify intruders and alert staff? These are really exciting possibilities and we're only just beginning to understand where else the algorithms could take us.

GC: Thank you for your time today.

DM/JF: You are very welcome.

Left: The Warehouse View enables easy visualisation of the time that a silo spends loading and idle.

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CKS Consulting

Improvements in kiln operation

The stable running of a cement plant's kiln results in quality clinker and lower operating costs due to electricity and fuel savings. Having a work team - control room operators, supervisors and bosses - with clear and uniform operating concepts facilitates the achievement of stable kiln operation and therefore the optimisation of costs. The latter is difficult to evaluate because of the many others external factors that influence costs. Nonetheless, if we improve the kiln running stability, sooner or later this indicator, as well as the quality of the cement and its constitency, will improve.

We may evaluate the running stability of a kiln by the quality stability of the clinker, both in its chemical qualities (alumina module (M_A), silica module (M_S), etc.) and in its degree of firing (free lime). Many factors influence the stability of these two things in a cement plant. Figure 1 shows, in yellow, the 'chain of qualities' of the process and, in other colours, the processes that may influence it.

Below: Figure 1 - kiln operation - 'chain of qualities' and quality-impacting factors.



Kiln operation is a complex job because it entails many different tasks throughout the day. We can draw a distinction between three types of tasks:

- 1. Start/stop machine tasks
- 2. Process control tasks
- 3. Other tasks.

Consider a car driven by many different people. Each one will start the engine of the car in much the same way, as per the instruction manual. But, when driving at 100 km/h and confronted with a sharp bend, the way in which each driver takes it will differ and so too will the end result. The strategy taken depends on one's driving background. As with cars, so with kiln operation. Every operator can start and stop a machine in the same way by following the operation manual. If however, for example, the burning zone temperature is falling, each one will take action with a different reaction time, using a different control variable. The results will be different. In some instances, the end product will have to be separated as off-specification clinker.

It is not always easy to identify the good practices from the bad, because the supervisor may not have a structured methodology by which to identify them. Moreover, one cannot achieve this without previously defining a clear strategy for everybody. Conventionally, an operator learns kiln operation by working with another operator who is considered 'the best.' CKS believes that this approach is wrong.

CKS Consulting has developed a series of tools to improve kiln operation in order to improve kiln running stability.



1. CKS operation course

The first step is to run a course that focuses on kiln operation. The idea is not to show operators about different kind of burners, coolers, etc., nor cement's chemical composition. Rather, the training course offered is based on how theoretical concepts of 'process' and 'quality' impact kiln operation. This differs from the training currently found at cement companies.

2. CKS kiln operation strategy

At the end of the course, CKS develops and proposes

Right: Figure 2 - CKS Consulting's four-part kiln operation improvement toolkit.

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an operation strategy that it agrees with the client for use in a simulator exercise. This strategy will be similar to that used by automatic kiln process control systems. The difference is that these automatic systems only ever apply actions of the same magnitude minute-by-minute throughout a 24 hour cycle. By understanding and making decisions based on CKS's tailored strategy, the operator will be able to maintain an improved kiln running stability.

Below: Figure 3 - CKS kiln simulator interface.



Right: Figure 4 - CKS graphs for kiln operation monitoring.

3. CKS kiln simulator

CKS Consulting has developed a kiln simulator which consolidates all relevant criteria to the operation of a kiln. The tool is adaptable to the different types of existing systems (with or without calciner, one or several streams, grate or satellite cooler, bypass, etc.). This reproduces the operation of the installation in a way similar to a real line, entirely removing the need for downtime during the training stage.

CKS adjusts the simulator to the process, quality and installations of the existing plant from process data and design details provided by the customer. The simulator is adapted precisely to the process, but not to the start and stop machines. In the case of new installations, CKS develops the simulator taking into account design and warranty data. Once it has put it into operation, it is adapted to the real operating data. The tool has a simple interface so that the user can focus on the operation. In addition, ownership of the simulator implies a licence for several computers, which can be used at any time and for life.

Firstly, the operators execute a series of basic exercises that allow for the consolidation of all of the concepts taught and to be applied in the exercises that will be developed in the simulator. Subsequently, an operator undertakes a series of lessons and their performance is evaluated to get an idea of the degree of progress in learning the operation of the kiln. Lessons include, for example:

- 1. False air inlet in different parts of the process;
- 2. Material encrustations in riser ducts and cyclones;
- 3. Blocking of cyclones;
- 4. Formation of rings in the kiln;
- 5. Fall of rings in kiln;
- 6. Variations in kiln feed quality;
- 7. Fluctuations in main and alternative fuels;
- 8. Increase of production;
- 9. Setting in regime;
- 10. Increase of alternative fuel consumption.

Finally, an automatic process control system helps users to understand how to apply the defined strategy. This is integrated into the simulator, which allows one to understand how it works and its benefits. It is totally aligned with the course and the operation strategy.



4. CKS kiln operation analysis

The best way for the new strategy to be used and to persist over time is to monitor it daily and evaluate its application. This application comprises a series of graphs with process variables and actuators, wherein it is easy to see if the operator has followed the rules defined for the control of the kiln. The possibility of using this tool lies in the availability of minute daily data from the central control room. The exchange of opinions over time between supervision and operators using this tool, will strengthen and improve the operation strategy.



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Peter Jeppesen, Global Product Line Manager, Crushing and Material Handling, FLSmidth

Crushing it

Two high-profile greenfield plants, El Beida in Algeria and Xuan Thanh Cement in Vietnam, have joined the growing number of producers that have been using the new FLSmidth[®] Strike-Bar[™] Crusher since it was released in 2018...

Not all raw materials are alike. Their composition and lump size can vary considerably from site to site. The FLSmidth Strike-Bar Crusher was designed using experience from the well-established FLSmidth EV^{∞} Crusher. From its inception it was built to be versatile. It can handle a lot of different compositions and covers a variety of raw materials.

Fast installation

The innovative design also helps quick initial set-up of the crusher. At the Xuan Thanh cement plant in Vietnam, installation procedures were performed in record time. This is due to the carefully-designed housing that consists of four pre-assembled and manageable sections that are easy to arrange on-site. At the El Beida cement plant in Algeria, set-up was similarly efficient and production was able to get up to speed quickly. The equipment can be commissioned quickly and efficiently in just a few days.

Designed for durability

Over 50 years of experience with crushing technologies was put into developing durable features for the Strike Bar Crusher. One of the most notable is the strike bars that have a long wear life.

"Durability and maintenance were the chief aims when the new crusher was conceived," says Henrik Sørensen, FLSmidth's Global Chief Engineer for Crushers and Feeders. "By interchanging between the four different positions, the strike bars are useful for 50% of their original weight. Replacing wear items less often saves time and money, as does replacing them faster, so we also made the replacement of parts quick and easy, significantly cutting potential operational downtime."

Below: Summary parameters for FLSmidth Strike Bar Crushers at Xuan Thanh and FL Beida

Right: FLSmidth's Strike-Bar Crusher at Xuan Thanh Cement

in Vietnam crushes 650t/hr.

Xuan Thanh, Vietnam	
Size	Strike Bar Crusher 200 x 200
Ouput	650t/hr (max. 5% residue on 30mm sieve)
El Beida, Algeria	
Size	Strike Bar Crusher 200 x 300
Output	1300t/hr (max. 5% residue on 73mm sieve)

Time *is* money so the Strike-Bar Crusher is also quick to adjust. It can take several hours to correctly set the gaps between the rotor and breaker plates in traditional crushers. However, due to its adjustable hydraulic



cylinders, the Strike Bar Crusher can be aligned in just a few minutes. This greatly reduces the time lost due to stoppages.

Raising capacity

Capacity potential on the Strike-Bar Crusher is also hefty, making it especially suitable for 'mega plants' like the one in Xuan Thanh, which processes 12,500t/day, the largest plant in South East Asia. The Strike-Bar Crusher has a throughput capacity of up to 2600t/hr and the crusher can handle larger lump sizes of greater than 2m and masses of up to 4t. The maximum size reduction ratio is 1:40.

Low total cost of ownership

The Strike-Bar Crusher was crafted specifically for the cement production process with the goal of creating a piece of equipment that has a low total cost of ownership. This means a combination of durability, ease of maintenance and reduced loss of production due to stoppage. As the crusher is based on FLSmidth's proven technology and boasts features that reduce the wear effects in harsh operating environments, it is fully enabled to help operations achieve their true potential economically.

After all, consistent and reliable feed to the raw mill is vital to achieve production targets in cement production. "It all starts with investment in a reliable and durable crusher that is up to the task," concludes Sørensen. "After only a year in production, we are pleased that the Strike-Bar Crusher is literally 'crushing it' at a number of the most modern cement plants around the world."

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Dr. Dominik Aufderheide; Ulrich Stromkampf, Di Matteo Group, Germany; Kai Wagner, Phoenix Cement, Germany

Alternative fuel utilisation at Phoenix Cement

The Phoenix Cement plant in Beckum, Germany, received an alternative fuel (AF) feeding line after the major update of the plant's calciner set-up in Spring 2019. Di Matteo based the overall architecture of the feeding line on its modular MultiFUEL concept, which it has implemented in numerous AF installations for all kinds of secondary fuels.

oday, day-to-day work in the cement industry, f L both in headquarters and plant offices, is mainly determined by economic drivers, such as the need to increase the production efficiency and capacity by a parallel reduction of costs of maintenance personnel and shorter return-on-investment (ROI) periods. In this context, the optimisation of energy resources and raw material supply are important factors that most plants already consider. Thus, the increased substitution of conventional fossil fuels with alternative energy resources has been an ongoing process over the past few decades. The utilisation of energy-from-waste concepts will speed up even more on a worldwide scale over the coming years. Phoenix Cement in Beckum, Germany, is following an ambitious schedule for its alternative fuel (AF) utilisation and, while the plant was also pioneering with the very early adoption of refuse-derived fuels (RDF) for its main burner, increasing the substitution rate for the pre-calcination process is a next milestone towards a green future of modern cement manufacturing.

As a supplier of turn-key solutions for the coprocessing of waste streams in energy-intensive industries, including cement, Di Matteo has developed a wide range of plant concepts and corresponding machines for almost every kind of AF and possible application field. The installation at Phoenix Cement is based on the company's well-established MultiFUEL concept for the efficient utilisation of AFs with an industry-leading capital expenditure (capex) and operating expenditure (opex) efficiency. This concept (Figure 1) views the thermal utilisation of AFs in a cement plant as a set-up of machines in seven different stages:

1. Reception: units such as docking stations for the reception of AFs from trailers, dumper trucks etc.

2. Preparation: machinery for the preparation of the received material prior to the combustion process, such as screening, magnetic separation, deagglomeration, drying etc.

3. Storage: silo and bunker systems for the intermediate storage of AFs within the plant and their corresponding discharge systems, such as screw dischargers, moving floors (ODM-MovingFLOOR) etc.

4. Transport: conveyors for the transport of AFs in the plant, such as screw conveyors, drag chain conveyors, pipe conveyors, bucket elevators etc.

5. Metering: metering devices, for example the ODM-WeighTUBE, for the gravimetric dosing of AFs for a precise control of the combustion process.

6. Feeding to the kiln: screw feeders, injectors, pneumatic pipelines etc. mechanical or pneumatic feeding of kiln inlets or calciners.

7. Combustion: correct implementation of previous steps maximises possible AF substitution in kilns.



Right - Figure 1: Seven Stage Concept (SSC) for the systematic classification of AF-handling plants.

GLOBAL CEMENT: ALTERNATIVE FUELS

The AF supply chain to the cement plant in Beckum is mainly organised by local processing plants, where the lion's share of material stems from industrial waste and is processed from refuse consisting of wood, paper, textiles and plastics, defining a typical RDF-classified fuel. In comparison with the fuel used for main burner feeding, the material pre-processed for the calciner combustion is usually coarser and can appear in fractions of 2D particles up to 100mm x 100mm and also contains a quite significant number of 3D particles. Typical bulk densities vary between 0.1t/m³ and 0.3t/m³, with a moisture content of up to 25%. As usual for all kinds of AFs, all these properties are volatile and can vary enormously over time (Figure 4, Page 32). It was therefore one of the major design criteria for all machinery to be able to deal with a wide range of fuels and their associated properties.

The secondary fuel is delivered by walking floor HGVs to the plant and it was decided that the trailers themselves should be used as intermediate storage. Each delivery contains roughly 100-130m³ of fuel, depending on the compaction factor within the trailer. This guarantees a continuous material supply where the logistic supply chain can be sustained over weekends. Two ODM-Box DockingStations are used to realise a spillage-free reception of the material (Figure 2). Here, the trailers' walking floor systems are operated by a dedicated stationary hydraulic power unit (HPU). It is possible to feed either material from one of the DockingStations separately or from both trailers simultaneously. The latter option might be used for the blending of material where different material qualities and specifications are available on the local AF market. Thus, the flexibility of the new installation in terms of fuel quality and supply can be increased even further. In total, an intermediate storage of approximately 50t of material is always available for feeding. The MultiFUEL concept allows for extension to up to 12 docking stations.

Each box is equipped with an ODM-ScrewDOS screw bottom, where each system consists of five screws with field-installed variable speed drives in order to reduce cabling requirements. By controlling the speed of the screws, the volumetric infeed to the installation can be adjusted based on the current massflow setpoint. The material is afterwards transported with an inclination of approximately 45° to a preparation and dosing tower by means an ODM-TKF drag chain conveyor. For a maintenance-free operation, Di Matteo uses specially forged chains in its drag chain conveyors with a dedicated material composition in order to survive the often corrosive environment caused by AF. The same applies to the specific wear-resistant abrasion liners.

In surveys regarding the reasons for downtime of AF feeding installations, most answers will





Left - Figure 2: ODM-DockingStations for material reception.

Left - Figure 3: ODM-ScrewDOS screw bottoms and drag chain conveyor.

typically relate to impurities of the material stream. However, even if it is well-known by every experienced process technician that typical AF streams will never be completely free of foreign particles, there are numerous examples where this fact has been completely ignored during the design phase of AF feeding lines, which leads to scenarios where the availability of those installations suffer enormously from downtimes due to blockages (for example due to oversized parts in pneumatic feeding lines) and even machine damage (for example caused by metallic parts), not to mention the various possible process problems related to the infeed of undesired pieces of materials into the combustion process. Accordingly, Di Matteo decided to include associated countermeasures in the new feeding line to get rid of possible impurities remaining within the processed fuel.

A disc separator (ODM-DiscSCREEN) is used to avoid any oversized particles within the main material stream and to protect the machines further along in the process. To separate out oversized sediment material, the entire material flow is guided over the rotating sorting screens. During the conveying process, fine materials fall between the sorting screens or sorting rollers. The oversized material is transported further along and then ejected. The disc shape, construction materials, spacing and layout, as well as the size of the sorting area, are tailored to the bulk materials and the specific sorting job. The gaps between discs can also be adjusted to accommodate other materials.

Besides the impurities which are distinguished from the main material stream by size, non-ferrous and ferrous metallic parts cause problems in AF feeding systems. These particles cannot be separated

GLOBAL CEMENT: ALTERNATIVE FUELS

Right - Figure 4: Typical rejects from the ODM-DiscScreen disc separator.

Far right - Figure 5: Typical rejects from the ODM-MAS magnetic separator.





by typical screens or sifters due to the fact that their size and/or weight can be quite small. Di Matteo therefore typically implements magnetic separators (ODM-MAS) in its feeding lines. The compact and modular design of the drum magnetic separator enables integration into existing equipment. With the appropriate construction materials, the magnetic separator is especially low-wear and needs little maintenance. The working principle is based on a magnetic drum rotating within the material stream. Non-ferrous particles are conveyed to the main outlet chute, while ferrous particles stick to the magnetic drum and can be separated from the material stream. At the Phoenix plant, Di Matteo installed the ODM-MAS in the chute between the drag chain conveyor and the ODM-DiscSCREEN. All rejects are collected in distinctive containers which are emptied periodically, enabling the weight of the rejects to be deducted from the AF material price.

After possible impurities are removed from the main material stream, the fuel is collected in the intermediate hopper of the ODM-WeighTUBE gravimetric dosing system (GDS). The plant has

Below - Figure 6: ODM-WeighTUBE closed-loop control circuit.



commissioned the same machine for calciner feeding as the one which feeds its main burner. Due to the dosing screw-based design of the system, it can be used for coarser AF material without limitations. The maximum feeding capacity would be 12t/hr, a medium-sized dosing unit for Di Matteo. The ODM-GravitAS control system guarantees gravimetric dosing with a maximum deviation of +/-1% from the massflow setpoint.

The WeighTUBE (Figure 6) consists of a tubular screw conveyor, which is continuously discharging material from an intermediate buffer. The material is conveyed to the tube section, which is placed on a set of load cells and decoupled from the main frame of the machine by flexible connections. It is therefore possible to weigh the material in the tube (mtube). Furthermore, the actual conveying speed of the screw (*v*screw) is continuously acquired. Both values are processed to calculate the actual mass flow (M_{act}).

By taking into consideration the setpoint, it is possible to determine the actual deviation (e), which is fed to the continuous dosing controller (CDC). This calculates the necessary *v*screw adaptation to minimize the deviation under all circumstances and at any given time. All software elements are implemented within the ODM-GravitAS control system, which was developed by Di Matteo as a unified platform for weighing and dosing.

Afterwards, the material is pneumatically conveyed to the calciner, where the transition to the pneumatic feeding line is realised by the ODM-IZS rotary injector. To overcome the significant air leak rate of typical blow-through rotary vane gates caused by overpressure and the resultant clogging of the lower-density secondary fuel, Di Matteo has fitted a specially-designed ODM-IZS injector jet at the inlet of the conveyed air stream to the blow-through rotary vane gate. This can be used to adjust the airstream during operation to reduce the static pressure in the blow-through chamber significantly and thereby compensate for possible air leakages, ensuring an uninterrupted feed of the processed AFs into the kilns. Because all clients need shred adapted to their own production processes...

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CTP Team

CTP installs dual-loop waste heat recovery system with organic Rankine cycle technology

After completing the first successful Waste Heat Recovery (WHR) project in Turkey, CTP Team Italy signed a turnkey engineering, procurement and construction (EPC) contract in March 2019 to bring energy saving to Sönmez Çimento's 1.6Mt/yr integrated cement plant in Adana, Turkey, with its WHR system.

C^{TP} Team's WHR system has dual-loop configuration, enabling heat recovery from two available sources in the Sönmez Çimento plant: the kiln pre-heater and the clinker cooler. Two different heat exchangers fed with thermal oil and designed according to the specific temperature and inlet gas flow lower the temperature of the exhaust gas from the clinker production process.

In the WHR module, a 7.8MW, 3000rpm turbine is coupled with a 9.2MVA turbo generator to produce electricity for internal consumption by the cement plant. The new organic Rankine cycle (ORC) technology will provide an expected net power generation of 51 million kWh/yr, covering approximately 30% of the plant's current electricity needs. From an environmental point of view, the new system will reduce CO_2 emissions by 23,500t/yr. In addition, the system provided by CTP is totally water-free, removing the need to treat residual water from the process. CTP's fully automatic system drastically reduces the presence of operators during daily operation. Thanks to this specific advantage of organic cycles and to the total absence of water treatments in the process, the operating expenditure (opex) is reduced by 75% compared to an equivalent WHR based on a traditional Steam Rankine cycle.

CTP Team fully integrates WHR into the existing plant, guaranteeing a smart tie-in without affecting production parameters. Furthermore, CTP Team specially designs and manufactures heat recovery boilers for WHR to ensure high standard quality.

The WHR plant is scheduled to start operating in the first six months of 2020. The WHR solution designed for the Sönmez Çimento plant maximises electrical power production and cuts out water consumption for the joint benefits of a lower environmental impact and a lower reliance on the electrical grid.



Below: Sönmez Çimento Yapı ve Madencilik, Adana, Turkey.
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Velco GmbH

Velco guns for refractory lining repair

For more than 44 years, Velco GmbH has manufactured Rotomat-type machines (Figure 1) for the repair of refractory linings in Velbert, Germany. Today, nearly 1200 such machines are in use worldwide.

Below - Figure 1: Rotamat.

Below right - Figure 2: Gunmix working principle.

Right - Figure 3: Gunmix basic apparatus.



Right - Figure 4: Velco remote access.

To meet the demand for a mechanical technique for the application of high quality gunning compounds – whether low-cement (LC), ultra-lowcement (ULC) or no-cement (NC) – economically, with near dust-free delivery and very low rebound, Velco developed its patented Gunmix moistening system. It jets the water through the borings in the mixing nozzle, dispersing it in the finest particles with the help of compressed air (Figure 2). This results in an homogeneous mixture of the gunning compound and a nearly dust-free application with considerably reduced rebound. Existing gunning machines can be equipped with the Gunmix moistening system. For this purpose mobile units, either with or without remote control, (Figure 3) are available.



Velco offers its Remote Access Module (RAM) as something of a novelty. Users can equip any Velco machine with a RAM, which will allow it to call worldwide for machine data, for example operation hours, flow rates, water pressure, operational condition, fault messages or even the location of the machine. Velco provides a cloud which gives access to the display. The user simply needs a countryspecific SIM card to gain access with a smartphone, tablet or PC (Figure 4). Based on prior verification, the Velco RAM can also be retrofitted to existing Velco machines and machines of other brands.

Advantages:

- 1. Information about status and operation times;
- 2. Quick fault diagnosis by the support staff;
- Cost-effective only small data volumes are exchanged;
- 4. Safe No interference in the company network.







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Olha Lyeskakova, Mideco

Dust collectors at Cement Australia

Exposure to dust is a major occupational health issue in the cement sector. Inhaling cement dust, which contains various metal oxides, can lead to a number of respiratory conditions such as allergies and asthma. The most serious consequences are associated with silica. Long term exposure to silica dust can cause silicosis, chronic obstructive pulmonary disease, kidney disease and even lung cancer.

 $B_{\rm staff}$ by equipping them with appropriate personal protective equipment (PPE), educating them about the occupational dust exposure risks and providing a dust free work environment.

At many cement facilities this usually starts with installation of a dust collector. There are different types available on the market, each with their own features. The selection of the correct dust collector for your business, including the hood design and its position at your working site, is crucial to the overall dust management.

Case-study: Cement Australia

Cement Australia needed to upgrade the dust control system at its cement terminal in Osborne, South Australia. Ships offload cement at the site, which is then delivered to silos and storage sheds via a shorebased pnumatic operation. This system generated a significant amount of dust. Cement Australia engaged Mideco to review and improve its dust mitigation process quoting specific requirements:

- Total flow for two filters serving storage shed, 63,900m³/hr for shed ventilation;
- Total flow for two filters serving four storage silos, 59,800m³/hr for silo ventilation;
- Total flow for one filter serving truck loading spout, 3000m³/hr for truck loading ventilation.

Mideco proposed and delivered a comprehensive dust control system which involved three types of dust collectors:



1. Reverse air collector (RAC): Mideco refurbished the existing RAF21A reverse air dust collector at the north end of a receiving shed. The RAC provides very high efficiency dust collection. Its special features can guarantee a collection efficiency of 99.9% of all particulate matter down to 0.5µm. RAC's selfcleaning systems make them very suitable for challenging applications where dust is sticky, hygroscopic or ultrafine, as in the cement sector. The RAC dust collector is also the most compact method for high volume cloth requirements and gives a higher degree of filtration.

2. Flat pulse dust collectors: Mideco installed a free-standing FP15A flat pulse dust collector for the south end of the receiving shed. Mideco's flat pulse range of dust collectors is primarily designed to provide the largest possible cloth

Below: Commissioning of one of the two refurbished RAF21A reverse air dust collectors.

GLOBAL CEMENT: DUST SUPPRESSION

area in the smallest possible casing. They are designed to protect the filter on the inside. It is made from 2mm galvanised steel sheet. The casing is covered with anti-corrosion paint for external protection of the filter casing and hopper. Polypropylene cages keep the bags opened to maximise capacity. A reverse pulse cleaning system with jet tubes, solenoids and valves is mounted on the manifold to allow each element to be removed individually, while also facilitating maintenance.

The system also includes a safety ball valve. This isolates the system from the air supply and automatically bleeds the air from the manifold when the air supply is isolated, eliminating compressed air risks. The pulse timer includes a transformer to step the power down from 240V AC to 24V DC. This feature allows non-qualified personnel to attend to pulse cleaning system maintenance issues.

Mideco also supplied two 15A model flat pulse jet bag dust collectors for the storage silos. This filter is very similar to the southern end filter in construction, except that it doesn't require a hopper and discharge mechanism. The dust is pulsed back directly, into the silo via the opening at the bottom



Left: The FP15A flat pulse dust collector at the south end of the receiving shed.

of the filter. This model is fairly short in comparison with the tubular bag type filters. It packs the maximum quantity of un-pleated, filter media in a filter case. The access doors to the clean and dirty air sides of the filter can be accessed from the silo roof top, without the need for tall ladders. The above-mentioned advantages make this style of filter ideal for silo vent applications.

> Economy dust collectors: A Mideco ECP20 Economy, a self-standing dust collector for the truck out-loading area was also installed. This model packs the maximum quantity of un-pleated filter media in a filter case. The filter is ducted to the truck filling spigot via duct work. The pulsed dust is collected in a container located at the bottom of the hopper.

Summary

The types and location of dust collectors carefully selected to meet the project requirements created a comprehensive, multi-layered dust control system for Cement Australia.

Left: View of the Cement Australia Osborne terminal from the main office building.



Subscribe

Stefan Koch, Hazemag GmbH

Shades of clay: a project study on the analysis and processing of sticky materials

Hazemag's experience in processing sticky materials dates back to the mid 1950s. At that time, comminution always took place in combination with drying. Since Hazemag today offers crushers without drying capabilities for applications where the material can become quite sticky, the evaluation of such limits has become more important.

Right - Figure 1: Hazemag's new Adhesion Measuring Device.

Trying to mitigate the impact of the adhesion of clay or any other kinds of clayey material often results in a processing nightmare. Hazemag, in close co-operation with one of the world's top cement producers, has initiated a study within the narrow area between science and practical application to analyse clays and clayey materials with the objective of ascertaining their actual clogging potential.

In total, 29 different material samples, mainly clays, were collected from 19 different locations all over the world where the best practice procedures in mining and material handling have been analysed and the potential of clogging of different equipment components is known.

Water content alone is a very unreliable and sometimes even misleading value by which to determine the physical properties of sticky materials. One clay may be very difficult to handle at 15% moisture, where others are still easy to process at 30% moisture. Consequently, Hazemag had the idea of using a combination of different test methods to determine the potential of clogging of such materials.

A test program was carried out to determine the suitability of different Hazemag test procedures to forecast the potential impact of the clogging bysticky soils on the aprons, hammers, grinding paths, crushing segments etc. of Hazemag crushers and to identify their risk potentials for mining and material handling. Hazemag carried out over 500 individual tests and analysed the results for interrelations.





One of these test procedures was carried out on Hazemag's new Adhesion Measuring Device (Figure 1), which fills a cylinder barrel with soil under defined conditions, such as consistency and compaction. It pushes a piston onto the soil surface with a defined compression force over a defined time before lifting the piston at a defined speed. It then measures the adhesion tension. An investigator explores the piston surface visually for adhering material.

As a result of this study, which lasted more than a year, Hazemag is now able to forecast the potential of clogging of different soils and has defined application limits with regard to the clogging potential for different processing equipment. It can now identify risk potentials regarding mining, crushing and material handling at an early stage of a project. To round up the results, the best practice tips for mining, crushing and material handling issues were collected during this project.

Right - Figure 2: adhering material on piston surface.



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GLOBAL CEMENT NEWS: PRODUCTS & CONTRACTS

Contents Subscribe Ad Index

Egypt: Siemens reports on digitalisation survey

S iemens has submitted an integrated survey of the digitalisation potential of various industries in four zones to the Ministry of Industry (MoI) with a view to improving the competitiveness of Egyptian industry. Daily News Egypt has reported that the Germanybased technology company has already signed contracts for the supply of digital efficiency solutions with El Ameria Cement and Lafarge Egypt. It is also negotiating with Misr Beni Suef for the installation of thermal emission measuring units at its 3.5Mt/yr integrated cement plant in Beni Suef.

Germany: KE Consultant and KIMA Process partnership

Klaus Eichas of KE Consulting has taken over the role of consultant to KIMA Process Control's Eastern Europe, Russia and Central Asia region sales and engineering team. KIMA provides real-time measurement solutions for various applications in the cement industry, including for fill levels in ball mills.

Namibia: Ohorongo marks nine year rail partnership

Ohorongo Cement has marked nine years in a partnership with Transnamib, Namibia's state railway company. The partnership covers coal transportation from the Port of Walvisbay to Ohorongo's integrated cement plant at Otavi and despatches of palletised cement. Transnamib also arranged additional train services between Tsumeb and Ondangwa to support shipments to the north of the country.

"We highly value our relationship with Ohorongo Cement as its increased utilisation of rail transport allowed for the implementation of our road-to-rail strategy which has resulted in a reduction of approximately 150 trucks on the road between Tsumeb and Ondangwa," said Zebby Mukungu, Marketing and Sales Manager at Transnamib.





UK: GyroMetric Systems to supply digital monitoring solution to Tunstead

GyroMetric Systems has signed an agreement to install digital monitoring equipment on a 11kV raw mill drive at Tarmac's Tunstead cement plant in Derbyshire. Measured digital parameters will include dynamic torque across the coupling, radial displacement of the shaft (and therefore misalignment), and torsional vibrations of the drive system. The data will also provide information on the condition of the gearbox. GyroMetric Systems is controlled by Remote Monitored Systems. No value for the order has been disclosed.

Russia: New Volvo dump trucks for Eurocement

Eurocement has received nine new Volvo FM 8 x 4 heavy-duty dump trucks for its Kavkazcement and Maltsovsky Portland Cement plants. The vehicles have a capacity of 32t and include Volvo's CareTrack telemat-

> ics system. The cement producer hopes to increase the volumes of limestone it transports from each plant's quarries by 15%. It has spent Euro13m on the new trucks.



Russia: Topkinsky Cement upgrading mills

S ibirsky Cement has issued details of upgrade work at its Topkinsky Cement plant. Cement grinding mill No. 9 was upgraded with replacement housing and updated mill equipment. Minor overhauls have also been made on mills 1 and 2 including work on the gearbox. Restorative work has also been conducted on the rotary kilns 1, 4 and 5 and on all packaging lines.

GLOBAL CEMENT

US: Port-A-Trac solution from Bricking Solutions

Bricking Solutions is promoting its Port-A-Trac refractory pallet transport system (below) for increased efficiency and safety during refractory installations. The Port-A-Trac allows installation crews to transport full pallets of brick into the kiln and under the Bricking Machine easily and with minimal risk to workers, kiln or materials. It increases transport efficiency by more than 20%.

The Port-A-Trac is manufactured using high-strength 6061-T6 aluminium to allow safe transportation of a full 1814kg pallet of bricks without damaging the kiln surface. It is ideal for use in small kilns where forklift access is prohibited and other options, such as manually transporting materials, are physically strenuous and inefficient.



Philippines: Cemex orders MVR mill from Gebr. Pfeiffer

Cemex Philippines has ordered an MVR type mill for cement raw material grinding from Germany's Gebr. Pfeiffer for a plant in Antipolo. The order also includes an MPS mill to grind coal. Gebr. Pfeiffer said that the order was received through a Chinese general contractor. No value for the order or timescale was disclosed.

Kyrgyzstan: New packing plant for Kant Cement

Kant Cement has upgraded the packing equipment at its integrated plant. Russia's Vselug supplied a Turbo K8 filling machine and Germany's Berg provided compressors. The company plans to sell at least 60% of its products in 25kg and 50kg bags following the upgrade.

The plant also received a new burner from Austria's Unitherm Cemcon in 2018 and will upgrade its electrical substation by the end of 2019.



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Romania: LafargeHolcim cleared to buy Somaco

Romania's anti-trust authority has completed its review of LafargeHolcim's takeover of the precast concrete manufacturer Someco for an undisclosed sum. SeeNews has reported that the body found that 'no significant obstacles to effective competition' were raised by the deal.

Somaco's five precast concrete and one aerated concrete block production plants, which employ 750 people, saw sales of Euro56m in 2018.

Croatia: Holcim buys Readymix Croatia

Holcim Croatia has purchased Readymix Croatia for an undisclosed sum. The subsidiary of LafargeHolcim said that the acquisition would allow it to invest in a fourth quarry in the local market located at Vranje near Lupoglav, Istria. Its aggregates business started operating in 2006 in Ocura in Varaždin County, then in 2007 in Plovanija and in 2008 in Šumber in Istria County. The building materials company operates one integrated cement plant in the country at Koromačno.

UK: Aggregate Industries buys Maxi Readymix

Aggregate Industries, part of LafargeHolcim, has acquired Maxi Readymix Concrete, an independent readymix concrete (RMX) business based in Leicestershire and the East Midlands. The company operates a Betomix 2.66m³ twin shaft wet batch plant capable of producing 110m³/hr of compacted concrete with a silo capacity of 400t and aggregate capacity of 650t. It was supplied by Germany's Liebherr and commissioned in 2014.

New Zealand: Widespread concrete defects

Researchers from Concrete Structure Investigations have developed new imaging technology and have used it to reveal widespread deficiencies in the concrete structures of buildings in New Zealand. The company used pioneering ultrasound technology to 'look' up to 2m inside concrete structures, including columns, beams, floors and walls. It found 'critical' structural errors in around 1100 of 1200 buildings examined over the past three years. Researcher Jane Roach-Gray said, "Key elements are not going in correctly, or at all. Once it's covered in concrete, nobody will know." The individual buildings in guestion cannot be identified for legal reasons.

UK: Hanson acquires Rochester readymix plant

Anson has opened a new ready-mixed concrete plant in Rochester, Kent, to supply growing demand for construction projects in the South East of England. The new unit replaces the subsidiary of HeidelbergCement's former concrete plant in the town. The group says it provides increased capacity, improved productivity, lower power consumption and reduced ongoing maintenance costs.

France: New concretes from LafargeHolcim

afargeHolcim France says that it has become the first cement manufacturer to offer 'tailor-made' concrete solutions, with a range of concrete products for eight different applications. The products include concretes made with specially adapted cement for thermal insulation, resilience to acid and seawater and one with an 'optimised CO₂ balance.'





US: New TBH plant

Thomas, Bennett & Hunter (TBH) has had a site plan to build a new ready-mixed concrete plant in Hagerstown, Maryland approved by the Washington County Planning Commission. The concrete producer is moving its operations in the town to a new site, according to the Herald-Mail newspaper. It is hoped that the new RMX plant will be commissioned by the end of 2020.



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Russia: Siberian Cement produces 2.6Mt of cement

Siberian Cement has reported a 4% year-on-year rise in its cement volumes in the nine months to 30 September 2019, to 2.6Mt from 2.5Mt in the corresponding three quarters of 2018. Of its three production lines, output fell at its Krasnoyarsk Cement and Volna plants by 9% and 14% respectively. 324,000t of cement was produced at its Timlyuisk cement plant over the period, a 21% increase on the 2018 figure of 268,000t.



Russia: Sibirsky publishes Topkinsky upgrade plans

Sibirsky Cement has issued details of upgrade work at its Topkinsky Cement plant. Cement grinding mill No. 9 was upgraded with replacement housing and updated mill equipment. Minor overhauls have also been made on mills 1 and 2 including work on the gearbox. Restorative work has also been conducted on the rotary kilns 1, 4 and 5 and on all packaging lines.

UK: New Fuchs materials warehouse

Luchs Lubricants is building a new Euro5.5m raw materials warehouse at its headquarters in Staffordshire. Work on the project started in August 2019 and it is due for completion in the second quarter of 2020. Once completed it will 'significantly' increase the amount of raw material the business can store on-site.

The warehouse will have a capacity of approximately 4000 pallet spaces, with ability for automatic or manual storage place allocation. Two wire-guided driverless Very Narrow Aisle trucks will operate in the unit. Warehouse Control and Warehouse Management Systems will streamline the process, with benefits including goods receipt entry and booking, a paperless put away process, inventory support and batch traceability.

Russia: Mordovcement sets rail record

Mordovcement, the Mordovan-based subsidiary of Eurocement, shipped a total of 2.3Mt of cement by rail in the nine months to 30 September 2019, a year-onyear increase of 31%. In July 2019, the company says it set a Russian record for number of carriages filled with cement in a single shipment, with 210 carriages. Russian Railways recognised the company's high shipping volumes with a formal expression of thanks for 'ensuring high rates of growth in freight traffic' at a Russian Railways Company Day celebration ceremony.

Ukraine: Tariffs stimulate market

Anti-dumping duties on clinker and Ordinary Portland Cement (OPC) from Russia, Belarus and Moldova introduced by Ukraine in mid-2019 have benefited local producers. Mykola Kruts, the chairman of the board of Ivano-Frankivskcement, said that his company has been operating at a 90% capacity utilisation rate, according to Interfax-Ukraine.

France: Hoffman Green Cement Technologoies launches IPO

H offman Green Cement Technologies has launched an initial public offering (IPO) to raise Euro50m on the Euronext Growth market. The company wants to use the funds to build two new plants with a capacity of 0.25Mt/yr in Vendée and in the Paris region, according to the Le Figaro newspaper. Hoffman Green Cement Technologies inaugurated its pilot plant at Bournezeau, Vendée in 2018. The unit is developing cement products using flash-calcined metakaolin and blast-furnace slag.

Netherlands: Cementir Holding takes up new headquarters

Camsterdam. The building materials producer approved the decision in late June 2019. The transfer will not affect the company's listing on the Italian Stock Exchange or its tax residence, which will remain in Italy. Chairman Francesco Caltagirone, Jr said that the decision to move the company's headquarters was 'a purely technical choice that in no way disregards our group's deep Italian roots.'

Cementir Holding employs approximately 3100 people in 18 countries. The group sold its principal Italian business, Cementir Italia, and its shares in related companies to Italcementi in early 2018.

CEMENT NEWS

Germany: Cement consumption rises slightly to 29Mt in 2019

Data from the German Cement Works Association (VDZ) shows that cement consumption rose slightly to 29Mt in 2018. Imports were 1.5Mt and exports rose by 1.5% year-on-year to 6.3Mt. The association says that this shows the industry is in a stable phase that is expected to continue in 2019 and 2020.

"There has been an upward trend in the German cement market for four years now, thanks in particular to the positive development in the apartment block sector," said VDZ president Christian Knell. He added that annual growth in consumption had slowed but that this was 'hardly surprising' given the 'tight' capacities along the construction value chain.

Italy: AF substitution nears 20%

The Italian cement industry decreased its overall CO_2 emissions by 8.9% in 2018 compared to 2017, in part by replacing a higher proportion of fossil fuels with alternative fuels and biomass fuels. The proportion of alternative fuels used increased to 19.7% in 2018 compared to 17.3% in 2019, according to Federbeton. This translates to 387,000t of alternative fuels.

Switzerland: Quarry expansion consultations called

Extraordinary Community Meetings have been scheduled in the municipalities of Veltheim and Auenstein for 22 and 23 January 2020 for further consultations with groups representing opposition to Jura Cement's Jakobsberg-Egg quarry development plans in both districts. The company is planning a total 10.5 hectare expansion across both municipalities and an operational change to material processing, beginning in 2022.

Switzerland: LafargeHolcim gets Chief Sustainability Officer

afargeHolcim's executive committee has taken on Magali Anderson in the newlycreated role of Chief Sustainability Officer. LafargeHolcim CEO Jan Jenisch expressed the importance of the role to achieving 'zero harm to people and the environment.' With HARDTOP Wear Castings you always hit the nail on the head!

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UK: Global Cement and Concrete Association launches research network

The Global Cement and Concrete Association (GCCA) has launched 'Innovandi,' a research network between industry and scientific institutions. The network intends to research the areas of process technology, including the impact of co-processing, efficiency of clinker production and implementation of carbon capture and utilisation/storage technologies and products. This will include the impact of clinker substitutes and alternative binders in concrete, and improve the understanding of CO₂ reduction through re-carbonation.

"Our industry is fully committed to taking action to reduce CO_2 emissions. As such, Innovandi is an industry led initiative and will bring together the best minds from all corners of the cement and concrete world, academia and business," said Benjamin Sporton, CEO of the GCCA.

24 companies from the cement and concrete industry, including cement and concrete manufacturers, admixture specialists and equipment suppliers, have committed to the initiative, with scientific institutions and additional companies set to join as its work begins work. These include Buzzi Unicem, Cementir Holding, Cementos Argos, Cemex, CNBM, Chryso, CRH, Dalmia Cement, FLSmidth, Grupo Cementos de Chihuahua (GCC), GCP Applied Technologies, Mapei, HeidelbergCement, LafargeHolcim, Nesher Israel Enterprises, SCG Cement, Titan Cement, Refratechnik Cement, Sika Technology, Subote New Materials and Votorantim. As part of the new initiative, the GCCA also intends to establish an annual Innovandi global conference to promote collaborative innovation and research in the sector.

UK: Hanson Cement appoints Nina Cardinal national technical manager

Dr Nina Cardinal has joined Hanson Cement as its new national technical manager. She heads up the division's technical team, which offers customers advice, information and support on all cement and cementitious issues.

Nina previously worked at Tata Speciality Steels for more than 20 years, latterly as technical director responsible for a 70-strong team, before joining the University of Sheffield as director of operations in the Faculty of Science in 2016.

"I am delighted to join the Hanson team," said Cardinal. "I am looking forward to building on our market-leading technical support and working with our customers to ensure they get the best possible customer service."

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UK: GCCA launches eco tool

he Global Cement and Concrete Association (GCCA) has launched the GCCA Industry EPD Tool (Version 2.0) to support the publication of environmental product declarations (EPDs) by cement and concrete producers. Originally commissioned by the World Business Council for Sustainable Development Cement Sustainability Initiative, the new GCCA Industry EPD Tool includes the latest database of energy impacts from cement production from across the world, supporting the output of more accurate EPD data. The GCCA is making the tool available to all producers and organisations in the cement and concrete industry to increase availability to designers and clients of EPDs to support the sector to deliver a sustainable built environment.

Spain: Andalusian demand drops

Cement consumption in Andalusia fell by 3.3% in August 2019 to 221,970t. For January – August 2019, total consumption was 1.87Mt. It is thought that this is due to a reduction in the region's construction sector and a lack of civil works.

Exports in August 2019 fell by 58% year-onyear, reaching 88,136t, around 124,719t less than in August 2018. The accumulated value for 2019 is currently 46% lower year-on-year, at 731,720t.



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GLOBAL CEMENT NEWS: EUROPE

Germany: Martina Merz appointed CEO of ThyssenKrupp

ThyssenKrupp has appointed Martina Merz as its chief executive officer (CEO). The current chairwoman of the supervisory board will be delegated to the group executive board for a maximum period of 12 months after which she will return to the supervisory board. Guido Kerkhoff, the current CEO, has agreed to leave the post by mutual agreement.

In addition, the supervisory board has appointed Klaus Keysberg to the executive board of ThyssenKrupp where he will be responsible for the materials businesses on the group executive board. He has held various positions at ThyssenKrupp since 1996 and has been CEO of the Business Area Materials Services since the beginning of 2019. He will continue to hold this position until a successor is appointed.

Siegfried Russwurm will succeed Martina Merz as the head of the supervisory board. The former Siemens executive board member has been a member of the supervisory board since April 2019.



Switzerland: Holcim Switzerland promotes family life

Holcim Switzerland has ratified a new collective labour agreement (CCL) with two unions. Finanznachrichten has reported that under the new arrangement the company's 570 employees will be able to receive two weeks' paid paternity leave. Lena Frank, head of personnel negotiations, said "The compatibility between work and family is central to equality. The new regulation is therefore an important step forward." **GLOBAL CEMENT NEWS:** THE AMERICAS

Argentina: Loma Negra to close Olavarría plant

oma Negra plans to close its Olavarría integrated cement plant. The unit has 45 employees who will be relocated elsewhere in the business, according to the Buenos Aires Económico newspaper. In recent years the plant has been operating solely as a grinding and bagging unit. The cost of upgrading the plant and the relative distance of its raw materials were factors in the decision to close it. The Olavarría cement plant was the first to be built in the country.

In September 2019 the subsidiary of Brazil's InterCement said it would convert its San Juan integrated cement plant to grinding and bagging only. Earlier in the year it came close to closing its Barker plant as it was unable to reach an agreement with the local union over redundancies. Alongside this it is building a new production line at its L'Amalí cement plant (see right).

US: Lyons residents raise dust complaint

People living near the Cemex Lyons cement plant in Colorado have complained about dust emissions. The Save Our St Vrain Valley group has filed a report with Boulder County Public Health about dust clouds rising from site, according to the Associated Press. The local authorities say that the dust doesn't appear to violate any existing regulations but Cemex officials have promised to look into the issue. The cement producer has also said that it has ways to mitigate dust emissions and it welcomes hearing from people so it can address any concerns.

US: Cemex does Energy Star double

Cemex USA's Miami and Brooksville South cement plants in Florida have been awarded Energy Star certification for 2019 by the Environmental Protection Agency (EPA) for work on energy efficiency and sustainability. The current year's recognition marks nine consecutive years of Energy Star certification for the Miami plant, while the Brooksville South plant has achieved the certification for seven out of the last eight years.

"Cemex is committed to delivering world-class products and services to its clients across the US and the globe while maintaining the highest sustainability standards in our industry," said Cemex USA president Jaime Muguiro.

To earn the recognition, operations at each plant followed energy-efficiency principles established by the EPA's Energy Star guidelines and implemented energy conservation technologies along with energy-reduction projects. The recognised facilities were among the top 25% of similar US facilities for energy conservation and met the Energy Star Plant Energy Performance Indicators.

Argentina: Loma Negra to hire 120 at new line

oma Negra's new line at its L'Amali plant in Olavarría Province, involving a kiln, two vertical roller mills and a bagging and palletising unit, will create 120 jobs, 80 of which will be at the plant. The company had previously estimated that 220 people would work on the line. In a statement, it emphasised the importance of maximising gender parity in its recruitment process.

Loma Negra said that the upgrade will enlarge the plant's capacity by 40% to 2.4Mt/yr from 1.7Mt/yr.

US: Study into electrochemical clinker production possibilities

A team of researchers at the Massachusetts Institute of Technology (MIT) have demonstrated an electrochemical process to make clinker in a laboratory. In the new process, pulverised limestone is dissolved in acid at one electrode in an electrolyser and CO_2 is released in a pure, concentrated stream. Lime is precipitated out as a solid at the other electrode. The lime can then be processed in another step to produce clinker.

Benefits of the new process include potentially substituting fossil fuels with electricity supplied from renewable sources and the production of a pure source of CO_2 that could be captured with less or no scrubbing compared to conventional clinker production.

Panama: Tax cement at 5%

The government plans to approve legislation charging a 5% tax on both locally produced and imported cement by the end of December 2019. The new rules will standardise existing laws that have only been applicable to the provinces of Cartago, San José and Guanacaste so far, according to the La Republica newspaper. The previous system was only being levied on two of the three cement companies with a presence in the country based on the location of their operations.





GLOBAL CEMENT NEWS: THE AMERICAS

Brazil: Note of caution amidst growing sales

Daulo Camillo Penna, the president of SNIC, the Brazilian national cement industry union, has expressed caution about growing cement sales so far in 2019. Data from SNIC shows that cement sales grew by 3% yearon-year to 40.5Mt in the first nine months of 2019 from 39.4Mt in the same period in 2018. Growth was driven by central and southern regions of the country, particularly in São Paulo. Exports grew by 22% to 90,000t from 74,000t. However, Paulo Camillo said that apparent growth in 2019 was partly due to a truckers' strike in May 2018 that overly depressed the year's sales. Despite this, he added that a survey of the construction industry released by the National Confederation of Industry (CNI) was showing slow but steady improvement.

Panama: Production scales down

A round 0.87Mt of domestically produced cement was sold in Panama in the six months to 31 July 2019, corresponding to a drop in production of 12.8% compared to the same period of 2018. Figures released by the treasury office showed total cement imports at a high of 85,600t, representing 10% of domestic consumption.

Argentina: Falling volumes match demand



Data from the Association of Portland Cement Manufacturers (AFCP) shows that cement consumption fell by 6% year-on-year to 8.5Mt in the first nine months of 2019 from 9Mt in the same period in 2018. Local despatches dropped by 5% to 8.5Mt to 8.9Mt, although exports rose slightly.

Paraguay: New INC President

ndustria Nacional del Cemento (INC) has appointed Ernesto Julián Benítez Petters as president. In his inauguration speech, he expressed his intention to continue the work of his predecessor for the company as a pillar of the Paraguayan economy.

US: Jules Kortenhorst elected to Solidia board

Solidia Technologies has appointed Jules Kortenhorst to its board of directors. Kortenhorst serves on the Energy Transition Commission and is the co-chair of the WEF Global Future Council on Energy. He is also a non-executive board member of the Energy Web Foundation and an advisory board member of Land Life Company. He is currently the chief executive officer (CEO) of the Rocky Mountain Institute (RMI). Prior to this he was the founding CEO of the European Climate Foundation (ECF) and he also served as a member of the Dutch parliament for the Christian Democratic Party.

Kortenhorst was the CEO for International Operations of ClientLogic Corporation and he worked for almost 10 years for Royal Dutch Shell, including managing director at Shell Bulgaria. He began his career as an analyst at McKinsey & Co. He holds an MBA from Harvard and a Master's in Economics from Erasmus University, Netherlands.

US: US\$600m production line for Lehigh Hanson Mitchell plant

ehigh Hanson has started construction work on a US\$600m upgrade to its Mitchell cement plant. The groundbreaking ceremony follows approval of an air permit by the Indiana Department of Environmental Management (IDEM) in July 2019, according to WBIW radio. The subsidiary of Germany's HeidelbergCement is building a new production line to replace the existing three lines at the site. Start-up for the line is scheduled for the third quarter of 2022.

Puerto Rico: Production increases as sales fall

Cement sales in Puerto Rico experienced a year-on-year fall of 7.4% in September 2019, to stand at 43,500t, the eighth consecutive monthly fall. Meanwhile, overall domestic cement production rose by 1.0% in the month under review, to 41,000t. This is the third increase reported to be observed during the first nine months of 2019.

Brazil: New refractory plant to serve cement industry

RHI Magnesita is planning a Euro57.1m Rupgrade, including a new refractory plant, to its Contagem complex in Minas Gerais. Francisco Carrara, president of RHI Magnesita South America, emphasised the importance of the Brazilian cement sector to the company, with operations in the country representing 75% of Magnesita's activities on the continent.

Ecuador: Holcim cements certified carbon neutral

Sambito, the Ecuadorian environmental consultant, has endorsed the certification of two LafargeHolcim cement products as carbon neutral. Metro Ecuador has reported that both Agrovial and Base Vial, prepared at low heats for foundations and roads respectively, have 54% lower emissions than 'traditional' cement.

US: Leadership awards for Ash Grove Cement, GCC and Lehigh Hanson employees

S taff members at Ash Grove Cement, GCC and Lehigh Hanson have won awards at the Portland Cement Association's (PCA) 2019 John P Gleason, Jr Leadership Awards. The awards recognise PCA members who have exhibited leadership in advancing industry programs and initiatives. The scheme is named after John 'Jay' Gleason, who served as PCA president from 1986 until his retirement in 2007.

Curtis Lesslie, Vice President of Environmental Affairs at Ash Grove Cement, won the Business Continuity award. He has served on the PCA's Environment and Energy Committee. He has promoted information sharing and benchmarking between companies and supported PCA's Occupational Health and Safety Committee as well as the PCA-MSHA (Mine Safety and Health Administration) alliance. David Gray, Market Manager, GCC of America won the Market Development award. The PCA said that he had been a consistent example to industry professionals, customers and industry associates on how promotion can be both a 'fun and rewarding experience.' At the customer level he has raised awareness of the potential gains for cement and concrete in a broad range of construction markets and helped companies and associations create successful promotion initiatives.

Nathan Kimball, Vice President, Safety & Health, Lehigh Hanson won the Young Leaders award.



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Contents

Peter Edwards, Global Cement Magazine

Review: 36th FICEM Technical Congress

The *36th FICEM Technical Congress* took place at the Barceló Bávaro Grand Resort in Punta Cana, Dominican Republic on 2-4 September 2019. With nearly 400 delegates from 30 countries and a 67-strong exhibition hall, the event was a great success...

The 36th FICEM Technical Congress began with an introduction from FICEM Chairman Alejandro Ramirez Cantú. The assembled FICEM members jointly operate 228 cement plants with 156Mt/yr of capacity, around 5.2% of the global total. With an average *per-capita* consumption of 286kg/yr, Cantú said that the cement sector of Latin America and the Caribbean has strong growth potential.

FICEM Technical Committee representative **Adolfo Gramajo** then spoke about the cement sector in the Dominican Republic. The sector has evolved greatly over the past 60 years, is energy efficient and strong in terms of health and safety. The country has the highest *per-capita* cement consumption in the region, higher than Brazil, Colombia and Mexico. It is expected to remain strong due to a stable combination of private construction and public works.

Minister for Mines **Antonio Isa Conde** further highlighted the rapid growth of the Dominican Republic's cement sector, with average 6%/yr growth since 2009. He said that the most important target for the Dominican cement sector now was to 'make the jump' in terms of environmental performance. He said non-renewable resources should benefit not only the companies that use them, but society as a whole. He told producers to take their environmental and social commitments seriously.

Ernesto Reyna from the Climate Change Council of the Dominican Republic finished the introductions with a stark assessment of the country's exposure to

climate change, which he called the most important challenge of the 2020s. The Dominican Republic is the 12th most at risk country from climate change, with four other Caribbean countries above it on the same list. Reyna called for the application of the 'many great solutions available' to reduce CO_2 emissions from cement production. Calling the current 2015 Paris Agreement 'insufficient,' Reyna said far more drastic action was needed. "The planet is running out of time," he concluded. "It won't wait for us!"

Technical presentations

As 38 presentations were given across the course of three days, it is not possible to summarise all of them here. The six Keynote 'International' presentations, are summarised below.

Yassine Touhari from On Field Investment began the presentations with a comprehensive summary of cement producer trends: past, present and future. Starting in the 1970s, the oil shock and Cold War prevented significant geographical expansion by major European producers, leading to vertical integration into readymix, aggregates, gypsum wallboard and other materials. In the 1990s, however, the collapse of the USSR meant that multinationals could expand rapidly into new markets, firstly in Eastern Europe, then Asia in the late 1990s and globally in the 2000s. When the financial crisis hit, many producers found themselves in debt.

1: The 36th FICEM Technical Congress was held at the impressive Barceló Bávaro Convention Centre, a short distance from the beach in Punta Cana.

2: *Global Cement* distributed its September 2019 issue at the event.





GLOBAL CEMENT: EVENT REVIEW - FICEM 2019

Investment plummeted and Chinese producers took their first steps internationally. Regional firms like Cementos Argos, Votorantim and Dangote Cement took the cue and developed their positions.

In the present, Touhari said that the EU cement sector is strong due to a mild 2018-2019 winter. The Middle East is seeing lower construction levels due to subdued oil prices and Turkey saw a 33% 'collapse' in sales in the first half of 2019. There is growth in South Asia and North America but the Latin American picture is currently 'mixed'. In the first three months of 2019 cement sales fell by 3%, but this was mainly down to poor sales in Mexico. Peru, Brazil and Colombia all improved, albeit from low bases. For 2019 as a whole, sales in Latin America are expected to fall by 3% year-on-year.

Touhari stated that there will be a 'new world order' in the future, with increasing international influence from Chinese players. Indeed, nine of the top 25 global producers will be Chinese in 2020. Many of these have cash to spend, with US\$20bn at Anhui Conch alone. However, the trade dispute with the US makes certain markets hard to access for Chinese manufacturers. For their part, major multinationals will be increasingly selective with new markets, will leave others and, as seen 50 years ago, will invest in readymix, aggregates and allied materials in established markets. Latin American producers have been among those to take the initiative when assets have been for sale.

Foreshadowing some other presenters, Touhari concluded by discussing the increasing importance of sustainability and novel solutions for lowering cement CO_2 emissions, including CO_2 capture and storage (CCS), which he termed 'currently not cost effective.' He also touched on digital measures, quoting research by a major multinational producer who found that a digitally-optimised plant controlled by artificial intelligence (AI) could decrease energy consumption by as much as 15%.

CEMA Foundation's **Dimas Vallina** spoke about the need to develop 'proper' corporate social responsibility (CSR) programs in the cement sector. "It's not that wer'e not explaining ourselves well," he stated, "We're not explaining ourselves at all!"

Vallina argued that, rather than 'boring' external parties with technical details, cement plants first need to explain what the process is for, i.e.: the construction of the modern built environment. They should highlight that they employ local workers, bring investment to the area and are acting rapidly to improve environmental performance. Vallina identified a number of key points, including the use of Best Available Technology (BAT) and ensuring that all workers are up to speed on the company's activities and message. Plant managers need to take charge of this from the top down. Lists of interested parties should be developed and relationships main-



tained, although, crucially, without the unhelpful 'teacher-student' dynamic. Meetings should be collaborative, with an emphasis on listening as well as speaking. Producers must be aware that the perception of heavy industry does not start from 'zero'. It is negative. Social media campaigns and well-informed employees are two important, low-cost tools that can improve this situation. The role of local associations is also important to develop concerted approaches at national and regional level. After all, states Vallina, "A sector's image is defined by its worst player."

Carlos Casasola of Miebach Consulting Central America & Caribbean presented on the topic of logistics, specifically in terms of disruption to existing practices. "Did you know," began Casasola, "that a drill is used on average for just 13 minutes?" This is great news for the drill manufacturer, he argued, but costs the user money and storage space. "I don't need a drill," he responded. "I need a hole in the wall!"

A response to this phenomenon is the sharing economy, in which assets are owned collectively or by one person / company and borrowed by others. Indeed this approach has now been applied to truck logistics in India. Is such an approach a threat to the existing supply chain model? Most certainly argued Casasola, who estimates that 50% of logistics will be provided by such methods by 2025.

Production strong in host nation

The Dominican Republic made 2.81Mt of cement in the six months to 30 June 2019, compared to 2.73Mt in the same period of 2018, an increase of 2.7% year-on-year. Data from Adocem shows that 0.50Mt was exported over the period, 17.8% of the Dominican Republic's production. The remaining cement boosted domestic sales by 5.2% to 2.31Mt from 2.19Mt in the first half of 2018, corresponding to a revenue of US\$223m. This represented an increase of 14.6% from US\$195m in the half to 30 June 2018, on the back of rising demand from construction projects. 3: A number of organisers, association and government speakers opened the proceedings at the event. Left to right: Ernesto Reyna, Dominican Republic Climate Change Council; Alejandro Ramirez Cantú FICEM Chairman; Antonio Isa Conde, Minister for Industry and Mines; Adolfo Gramajo, FICEM Technical Commitee & Maria José Garcia, FICEM Executive Director.

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4: SCRUM Consult's Philippe Fonta spoke on the topic of the circular economy.

5: Jerry Lewis from IBM Services gave a pan-optic view of digitalisation in the cement sector.

6: Fernando Martinera, Director of CIDEM and Regional Coordinator of the LC3 Project, spoke about the benefits of cements that contain calcined clay.

7: CEMA Foundation's Dimas Vallina spoke about the need to develop 'proper' corporate social responsibility (CSR) programs in the cement sector.

8: Carlos Casasola of Miebach Consulting presented on the topic of logistics, specifically with regards to disruption of existing practices.

9: Yassine Touhari from On Field Investment Research provided an excellent review of cement producer trends, past, present and future.

Casasola also discussed the increasing role of 3D printing. Yves Behar is in the process of planning the first 3D printed community to be built in Latin America. The ultimate aim is be able to go online, customise and order the desired building, bring the equipment to the site and print the building, all within 48 hours.

Turning to automation, Casasola stated that Miebach Consulting estimates that 50% of warehouse personnel will be replaced by robots by 2030. This is also a risk to truck drivers, both inside and outside of the plant. Rio Tinto already operates 73 autonomous vehicles hauling iron ore 24/7 in Australia. Casasola also highlighted the imminent prospect of truck 'platooning' on roads in the EU, where a number of autonomous vehicles follow a lead vehicle driven by a human. Those that think these approaches will bypass the cement sector are mistaken.

Philippe Fonta of SCRUM Consult spoke on the nature of the circular economy. He began with a series of dates, the first of which was 29 December 1970. This was the first 'earth overshoot day,' the day on which humans used up all of the natural resources that could naturally be regenerated in that year. Over the past five decades, the day has moved closer and closer to the start of the year, to as early 29 July in 2019. The situation is now so pronouced that we require 1.75 Earths to support current consumption.

Moving on from this stark introduction, Fonta outlined the historic 'linear' model of industry: Take, make, use, dispose. This is unacceptable, he stated, with a significant switch to a circular economy needed urgently. According to the Circularity Gap Report, the world is currently 9% circular. Some might look at that figure and be overcome at the scale of the task, said Fonta. However, it can also be viewed as a massive opportunity for 91% improvement in current performance.

The current solution to sustainability issues is to 'recycle.' However, this is not 'truly circular.' It is a reactive solution to the problem of waste. Quoting Ellen MacArthur, the famous sailor turned environmental activist, he said the largest obstacle to developing circular practices was being 'locked in a linear mindset.' "It's not about switching coal for solar power or a truck for a conveyor belt, but redesigning the entire industrial system," he said.

Fonta discussed the work of the World Business Council for Sustainable Development (WBCSD), which sought to simplify the 'cacophony of indicators' used to measure sustainability. The mixture of units, accreditation schemes and other indicators makes it hard to compare performance between regions and sectors. The Cement Sustainability Initiative (CSI), has done extensive work to standardise sustainability reporting across the cement sector.

Fonta concluded by introducing the New International Carbon Economy (NICE) concept, which has the aim of using ambient CO_2 as a carbon / fuel / plastic resource. This, he says, is a great opportunity for all nations, as CO2 is equally distributed, not concentrated in a few small areas like fossil fuels. He suggested that, eventually, the NICE system would be adjusted to decrease ambient CO2 levels. Read more about the NICE concept in our September 2019 issue.

Jerry Lewis from IBM Services spoke on the topics of digitalisation and Industry 4.0 in the cement industry. His wide-ranging talk considered current disruptive technologies, including 3D printing, modular cement plants and CO₂ trading. He also





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GLOBAL CEMENT: EVENT REVIEW - FICEM 2019

10: Edgar Martinez gave a frank and, at times, emotional account of the effects of Hurricane Irma on the Cementos Argos terminal in Sint Maarten in 2017. Despite containers' flying like dominoes,' the terminal was up and running again in just 10 days.

11: Corcement's Alberto Rufino.

12: CTP Team's Andrea de Finis spoke about the company's waste heat recovery projects in Turkey.

13: Cemengal's Fernando Dueñas (shown) spoke alongside Melón's Ivan Marinado. Marinado explained that overcapacity and low-cost imports from Asia had led to the adoption of a 'micro-market approach' by the cement producer. Dueñas explained how Cemengal's modular grinding mills had helped with this approach at its Puerto Montt plant. Two new Plug&Grind EXTREME mills, providing a combined capacity of 0.5Mt/ yr will be installed in Punta Arenas during the rest of 2019. with production to start in early 2020. When completed. this will be the world's most southerly cement plant.

14: ARGO-IPS GmbH's Peer Drüphake (left) in discussion with Jérôme Duez from HGH Systèmes Infrarouges (right).

15: Harold Beck & Sons' Robert Kritzer (left) and Esteban Arjona (right) from regional agent Master Control.

16: Bruker's Sigrid Portorreal (left) and Guilherme La Serra (centre) in discussion with visitors to the company's stand.

17: Fernando Dueñas (left) and Eduardo Granado García (right) on the stand of the Spanish modular grinding expert Cemengal.









spoke of a lack of 'digital talent' in the 'unattractive' building materials sector and the emerging focus not only on shareholder returns but the ability to manage sustainability.

Turning to digitalisation, Lewis highlighted that 72% of companies think that they are at risk of digital disruption but only 14% think they are sufficiently prepared. He estimates that this figure may be as low as 5% in the cement sector. A key feature of the new digital world is likely to be 'disintermediation,' the phenomena of digital service providers stepping in to optimise / disrupt existing supply chains. This has already happened in the hotel sector, where Airbnb, the largest operator, owns no real estate. The same is true of Uber, the largest taxi operator, which owns no taxis. Amazon, the largest retailer, runs no shops. Netflix, the largest 'picture-house,' has no cinemas.

Disintermediation is coming down the tracks for the cement and construction sector too. Lewis identified a particular company, Procore, which provides just-in-time material deliveries to construction sites in the US. In doing so, it is providing a solution to the problem of US\$50bn lost to construction delays in the US every single month. It is, in his words, 'a huge threat to all of you!' Lewis portrayed even the largest cement producers as 'scrambling to gain a seat at the table.' He suggested that Procore (and companies like it) would increasingly define the platforms and standards upon which the construction sector operates. Those that can become part of the accepted platform will do well. Those that cannot will miss out and, most likely, fold.

To adjust, a range of new approaches are required, including taking on a diverse range of new (Millennial) staff, dynamic pricing, AI optimisation / control, blockchain, augmented reality, enhanced cyber-security and more. He provided the example of Dow Chemical, where 50% of 22,000 staff are 32 or younger. Full digital transformation, he concludes, is the best way for cement producers to cover their bases and stack the odds back in their favour.

Fernando Martinera, Director of CIDEM and Regional Coordinator of the LC3 Project spoke about the opportunities for cements that contain significant portions of calcined clay, so-called LC3 cements. As CO_2 emissions costs press increasingly around the world, he argued that there is limited scope for increased cement production efficiency through traditional levers. Two industrial tests with LC3 cement have taken place in Cuba and one in India. The resultant 'new generation' of cement mortars produced using calcined clay has taken performance into a new zone, with compressive strengths in excess of 100MPa. Martinera expects that 25Mt/yr of LC3 cement will be produced globally by 2025. *Read more on LC3 cement in our September 2019 issue.*









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GLOBAL CEMENT: EVENT REVIEW - FICEM 2019



18: Chaoping Pan from CETEC was promoting the company's modular grinding installations.

19: Discsussions on the stand of Christian Pfeiffer, the ball mill and classifier expert.

20: CMD's Gillen Luro (left) and Juan Agustín Collado of elecmetal (right).

21: Tomás Zhang from CNBM Smart poses for the camera.

22: A busy scene at CTP Team, an Italian producer of dust mitigation and waste heat recovery equipment.

23: Delegates visited the Cemex San Pedro de Macorís plant on 5 September 2019.

24: DALOG Diagnosesysteme's Christoph Muschaweck (centre) in discussion with visitors to the company's stand.

25: Fives representatives Agustin Toloza Cubaque (left) and Hugo Arroyo (right).

26: Eduardo Sauto Odriozola (left) of Gorco SA in discussion with a potential customer.

27: Tom Wang (left) and Antonieta Cruz Aragon (right) of filter media producer FILMEDIA.

28: FLSmidth representatives and customers pose on the FLSmidth stand.

29: Marco Perli (left) and Alessio Casna (right) from Gambarotta Gschwendt.









Social Programme and Gala Dinner

On the opening night of the conference, the organiser held a well-attended welcome party in the exhibition hall, complete with local cocktails, food and entertainment. On the final day of the conference, a convivial Closing Gala Dinner was held on the beach at the Barceló Bávaro Grand Resort.

Plant visit - Cemex San Pedro de Macorís

On 5 September 2019 around 50 delegates visited the Cemex San Pedro de Macorís plant, the most modern cement plant in the Caribbean. Delegates travelled by coach to the plant, 115km to the west of Punta Cana. After a welcome and safety breifing, delegates visited key areas of the plant on foot. They were impressed by the plant's high standards of health, safety and cleanliness, as well as the expert answers from the many plant staff hosting the event. Read more about the plant on Page 62.



The 37th FICEM Technical Congress will be held in September 2020, with the exact dates and location to be confirmed by FICEM in due course.





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STANDARD

BULK

30: Discussions at bagging

32: MDG Handling Solutions' Davide Gambarotta (left) and Luca Mastrorocco (right).

33: Standard Industrie's Juan Angel Román Gallardo (left) and Patrice Darcheville (right).

34: Multiple discussions

minprotec / Boldrocchi /

35: Raül Llongueras from Zhenzhou Ruitai Refractories

Materials outlines the benefits

of his company's insulation-

backed refractory products.

36: Schenck Process was represented by Victo Hugo Valencia (left), Mauricio

Jimenez (centre) and Claudio Peldoza (right).

42: Representatives of the

globally-renowned refracto-

ries producer Refratechnik.

43: Christian Fink of robecco (left) and Carsten Pries

of Yara (right).

Estanda stand.

on the joint KHD Humboldt

Wedag /Aumund / Ingesoa /

expert Haver & Boecker.

31: All smiles at the KettenWulf stand.

33













39: The team

from Luoyang

Company pose

for the camera.

40: Discussions

thyssenkrupp

Industrial Solutions stand.

on the

Zhili New

Materials







37: Bob Blocksidge (facing left) and Max Salisbury (facing right) in discussion with visitors to the Thermoteknix stand.

41: Local representatives and customers of bag manufacturer Smurfit Kappa were out in strength.



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Vecoplan







Subscribe

Interview by Peter Edwards, Global Cement Magazine

Plant visit: Cemex San Pedro de Macorís, Dominican Republic

Global Cement recently visited the Cemex San Pedro de Macorís plant in the Dominican Republic, where Plant Manager Juan Gabriel Rijo provided a fantastic insight into the Caribbean's largest and most modern cement production facility...



Above: Juan Gabriel Rijo, Plant Manager at the Cemex San Pedro de Macorís plant in the Dominican Republic since 2011. The son of a civil engineer and an architect, Juan Gabriel says he has always been involved in the construction sector. He 'jumped at' the opportunity to work for Cemex in 2004 due to the high technology and potential for career development in one of the very few multinational companies active in the Dominican Republic in the early 2000s.

Global Cement (GC): Please could you briefly outline your background in the cement sector?

Juan Rijo (JR): I come from a family with a strong engineering background. My mother is a civil engineer and my father is an architect, both dedicated in parallel to the construction business and to university teaching. Their influence inclined me to study industrial engineering. After college, I started working with my family in construction projects for a short time, but my real interest was to work in an industrial environment and to have access to a passion of mine: computer technology. I decided to join the CEMEX 'family' in the pursual of a professional development in this area and found much more besides.

My first job at CEMEX was as a control room operator, right in the middle of the production process. I was lucky enough to be involved in the construction and commissioning of a second clinker production line at the San Pedro plant. Over the past 15 years, I have held positions in all subprocesses of cement production: quarries, raw mills, calcination, cement mills, packing plant and quality assurance.

GC: Please could you outline the history of the San Pedro de Macorís plant?

JR: Since the early 1970s, the Dominican construction market has been constantly growing as part of the policy of 'roads and cement' of President Joaquin Balaguer, turning this strategy into an economic locomotive in its government periods between 1966 and 1978 and then from 1986 to 1996.

In response to that exponential growth, Cementos Nacionales Company began the construction of the San Pedro Plant in 1971 and completed it in 1976. The plant had one clinker production line with a capacity of 1500t/day and two ball mills with a combined capacity of 140t/hr. Almost all the equipment came from Fuller.

In 1995 CEMEX acquired Cementos Nacionales as part of its international expansion strategy and immediately began a process of technology improvement and capacity increment on the clinker line. The acquisition of a new 170t/hr Loesche vertical cement mill in 2000 achieved a significant reduction in energy consumption.



Right: The San Pedro de Macorís plant is conveniently located by water, facilitating exports around the Caribbean.

GLOBAL CEMENT: *PLANT VISIT*

In 2003 CEMEX authorised the construction of a new clinker production line that began operating at the end of 2005. This new line provided new levels of quality control and product improvement and set the path to an evolution in the regional cement industry being the biggest cement facility in the Caribbean.

The new production line introduced full new technologies ranging from the limestone quarry to the packaging plant, and positioned the

San Pedro plant as a regional reference for CEMEX.

GC: What obstacles had to be overcome during commissioning?

JR: The construction process was agile. CEMEX was able to bring talented people to each area of expertise, dedicated huge resources and even designed part of the physical installation such as the five-stage preheater tower. The main obstacle to overcome was the weather. The summer of 2005 was one of the wettest rainy seasons that I remember and this affected part of the final construction and commissioning process, especially in the quarry and the raw mill.

Plant profile and summary timeline



GC: Please could you outline the production process used at San Pedro as it stands in 2019?

JR: The San Pedro plant has two clinker production lines, but currently only works with line two. Line 1, which has a capacity of 1800t/day is halted, awaiting a change in strategic needs or market demands.

Our production process begins its operation with the outsourcing of the extraction and transport of limestone from the quarry. The acquisition of geological and geophysical data, quality control and crushing are carried out by CEMEX. The hammer crusher is a Titan from ThyssenKrupp with a capacity of 1300t/ hr. It sends a mixture of raw material (limestone and



Left: The preheater tower of the plant's line 2, a Cemex in-house design that was commissioned in 2005.

Far left: Map of Dominican Republic, with locations of Santo Domingo and Cemex San Pedro de Macorís plant.

Left: View of kiln line 2.

GLOBAL CEMENT: *PLANT VISIT*



Right: The plant's 35,000t raw material storage dome.

clay) to a 35,000t circular reclamation warehouse via a Scantech cross-belt analyser. This warehouse has a 1300t/hr stacker and a 800t/hr PHB reclaimer that continues the homogenisation process. From there, the material is sent by a conveyor belt system underground to a group of storage silos. Then, the raw material and correctors are dosed by Siemens Milltronic weight feeders, to feed a 385t/hr four-roller Loesche raw mill, which uses the hot exhaust gases of the calcination process to dry and grind the raw material. This is then sent to a bucket elevator up to the 16,000t FLSmidth homogenisation silo, with a Pfister dual extraction system to feed the preheater tower.

The preheater tower is a Cemex in-house design comprising five stages with two alternatives feeding routes. This is designed to obtain exhaust gas feeds of different temperatures. The preheater tower has an online calciner and all the system is well equipped with temperature, pressure and flow sensors that allow an excellent control of the decarbonation process. The kiln is a 4800t/day two-pier FLSmidth design with an FLSmidth burner. The process monitoring is done by a Tempera thermal camera, for shell scan, and a thermal camera for flame control. The produced clinker is handled by an IKN grate cooler that recovers hot gases and sends them to a closed circuit that allows distribution as required, either to the Loesche raw mill or FLSmidth main dust collector. The main fuel used is petcoke, ground in a 29t/hr FLSmidth ball mill. The clinker is stored in a 40,000t bunker and a 20,000t flat warehouse. The system has the additional capacity of dispatch online via two different silos.

Cement is produced using three mills, two of them traditional horizontal two-chamber ball mills, with a combined capacity of 160t/hr and a 170t/hr two-roller Loesche vertical mill. There are two pneumatic systems and a common conveyor belt that allow the simultaneous production of three different types of cement. The plant has five cement silos with a combined capacity of 18,000t.

GC: Is cement supplied in bulk, bags or both?

JR: Customers are supplied through a packing plant that has four packing machines, each with a capacity of 127t/hr. Two are from Haver & Boecker and two are FLSmidth Ventomatic. There is a 4000t closed storage area for cement bags. For bulk dispatch there are three bulk loading systems, each with a capacity of 60t/hr.

GC: From where does the plant source its additives?

Right: Raw material is reclaimed from the storage dome and taken by underground conveyor to two intermediate silos.













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GLOBAL CEMENT: PLANT VISIT





Above and above right:

A tyre shredding plant was installed by Grupo SPR in 2016. The facility is shown during a visit by delegates to the 36th *FICEM Technical Congress* in September 2019. *Read more about the FICEM event on Page 54.* *JR*: The San Pedro Plant obtains its additives and corrective materials such as clay, gypsum silica, iron and pozzolans from local reserves. The plant is located over a limestone quarry that guarantees stability in the quality of the main raw materials. Fuels come from different sources but the main source is petroleum petcoke which comes from United States. All others, including alternative fuels, are locally available.

GC: What projects have recently been completed?

JR: Over the past three years our most relevant project has been the installation of a new cement packing machine to add extra capacity for projected construction sector growth. At the same time, we have assured our raw material supply for the next 60 years by building a bridge and overpass to our new limestone quarry on the west side of the plant.

GC: What fuels are used and how are they changing?

JR: The primary fuel is petcoke, although we are continuously working to expand the use of alternative fuels, especially RDF and used tyres. We have coprocessed whole tyres for many years, but in the past two years we have changed our strategy to consume shredded used tyres, seeking better combustion efficiency. An important turning point that we think will be realised in the coming years is an alternative fuel project that will unleash our alternative fuel consumption to a new level.

GC: How do you think the fuels used by the plant will change in the future?

JR: One of Cemex's priority objectives is the reduction of the CO_2 footprint. We are working locally with different institutions and government sectors to build and improve the culture of waste management, which we understand as one of the main opportunities to make a change in the environmental sustainability of the Dominican Republic. We expect that in the medium term a large proportion of our primary fuel will come from local waste.



GC: What emissions abatement systems are installed at the plant?

JR: In terms of emission abatement systems, we are focused on the clinker factor reduction as one of three strategies of CO₂ footprint reduction. As regards monitoring, we meet CEMEX's global continuous monitoring system (CEM) requirements on each clinker production line. We are using a SICK MAIHAK system to ensure we meet these targets.

Right: A view of the IKN clinker cooler.



David Salazar, Regional Cement Application Manager

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Markets and future

GC: What types of cement are made at the plant?

JR: Traditionally we supply two different products in the Dominican Republic construction market: A general use cement (Titan GU) and a higher specification cement for larger projects (Titan HE). Depending on our clients' needs we can also produce an ASTM Type I cement for specific projects within the Caribbean.

GC: To where does the plant supply cement?

JR: Our largest market is the Dominican Republic, where around 65-80% of our product is sold. Our export market is centred on the Caribbean islands, mainly Haiti, Aruba, Bonaire, Curaçao, Trinidad & Tobago, The Bahamas, Barbados and other small islands on the archipelago. Exports account for 20% usually, but this can rise to 35% if necessary to cover the needs of our regional market.

GC: What transport methods are used?

JR: Cement trucks are predominantly used for national cement distribution. The Dominican market is characterised by a high proportion of informal construction, mainly for the building of houses. This has traditionally been reflected in the amount of cement sold in bags, with a proportion close to 80%. However, during the past two years, the demand for bulk cement has increased, driven by the development of infrastructure projects. This trend is expected to continue.



GC: How has demand changed in the area that the plant serves over the past 2-5 years?

JR: In recent years, we have experienced a moderate but consistent growth in our local market, especially related to the government strategy focused on the designation of 4% of the national budget on education and the construction of primary schools. In addition, the economy continues to press positively, and infrastructure projects continue to develop.



Right: The plant's 170t/hr Loesche cement grinding mill was installed in 2000.

Opposite page: The plant has a total cement storage capacity of 16,000t.

Right: The San Pedro de Macorís plant is the largest and most modern in the Caribbean.





GC: What is the largest threat to the San Pedro de Macorís plant over the next 1-2 years?

JR: The largest threat could probably be climate change. It is undeniable that things are changing. For the Caribbean this means the emergence of increasingly powerful hurricanes. We can take as an example hurricane Maria, which hit Puerto Rico two years ago and recently hurricane Dorian. Both reached Category 5, the first time there have been two Category 5 hurricanes in three years. This is a major threat because in case of a direct hit, we could lose a significant amount of time and money renovating the plant, which would absorb resources that could otherwise be used for improvements.

GC: What is the largest opportunity for the plant over the same time-frame?

JR: The largest opportunity is associated with the approval of the new waste management law for the Dominican Republic. The implementation of this law will not only create a cleaner environment but would also create the conditions upon which we could substitute a significant portion of primary fuel with alternative fuels, reducing our CO_2 footprint. The lack of local regulation is the main obstacle to the development of a solid infrastructure for coprocessing within cement kilns. Therefore, we are dedicating a significant amount of time and resources to educate the industrial sector and the general population about the importance of the approval and enactment of this law.

GC: Juan Gabriel Rijo, thank you for your time.

JR: You are very welcome indeed - Thank you!

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India: LafargeHolcim and HeidelbergCement place bids for Emami Cement

afargeHolcim and HeidelbergCement have joined a bidding war for Emami Cement. LafargeHolcim is reported to have submitted an expression of interest via its subsidiary Ambuja Cement, according to the Hindu newspaper. HeidelbergCement has submitted its bids through HeidelbergCement India. Emami Cement has an expected value of around US\$845m. Nuvoco Vistas Corporation, Shree Cement and Dalmia Bharat have also been linked to the sale. Emami Cement operates a 2.5Mt/yr integrated plant at Risda in Chhattisgarh and a 2.5Mt/yr grinding plant at Panagarh in West Bengal. It acquired a 0.6Mt/yr grinding plant at Bhabua, Bihar in September 2018. In addition, the firm has mining assets in Guntur in Andhra Pradesh and near Jaipur in Rajasthan. Its main markets are in West Bengal, Chhattisgarh, Odisha, Jharkhand, Bihar, Maharashtra and Madhya Pradesh. It markets its products under the Double Bull brand.

India: UltraTech and Century Textiles and Industries hammer out merger agreement

U ItraTech Cement has declared the scheme of arrangement between itself and Century Textiles and Industries as part of its merger process. It will issue one equity share worth US\$0.14 each for every eight equity shares of the same value held by the shareholders of Century Textiles and Industries. UltraTech Cement received approval from the Competition Commission of India (CCI) for the acquisition of the cement business of Century Textiles and Industries in late August 2018 but it faced legal challenges subsequently. The acquisition further strengthens UltraTech Cement's lead in the Indian market. It says it is now the only company outside of China to have a production capacity of more than 100Mt/yr in a single country. It also claims that it is the third largest cement company in the world excluding those based in China.



Philippines: Phinma Corporation plans plant to satisfy demand

Phinma Corporation is spending around US\$50m on a new 2Mt/yr integrated cement plant at Bataan. Philcement, a subsidiary of Phinma Corp., and Seasia Nectar Port Services (SNPS) have signed a deal to take over the usage rights to pier facilities and land currently under lease by Philcement for a terminal for US\$15.5m, according to the Philippine Daily Inquirer. Eduardo Sahagun, president and chief executive officer (CEO) of Philcement, said that it would need up to US\$35m to complete the project. Once completed it will be possible to expand the unit to 4Mt/yr depending on market demand.

Pakistan: Thatta Cement's profit falls

Thatta Cement has blamed a fall in profit on rising input costs and negative currency effects. Its profit dropped by 40% year-on-year to US\$1.36m in the financial year to 30 June 2019 from US\$2.27m in the same period in 2018. Sales and distribution costs more than tripled to US\$1.4m. Its net sales grew by 22% to US\$22m from US\$18m. Total cement and clinker despatches increased by 34% to 0.56Mt from 0.42Mt.

China: Shanshui profit up by 46.6%

Shanshui Cement ended the nine months to September 2019 with a net profit of US\$352m, up by 46.6% year-on-year from US\$221m in the corresponding period of 2018. Revenue increased by 28.5% to US\$2.3bn from US\$1.8bn.

Vietnam: Growing volumes boost profit for VICEM

Vietnam Cement Industry Corporation (VICEM) produced 18.74Mt of cement in the first nine months of 2019, an increase of 8% year-on-year, according to the Dau Tu (Investment) newspaper. VICEM sold 18.83Mt of cement, a 7% year-on-year increase. Over the same period, VICEM's pre-tax profit rose by 35% year-on-year to US\$90.52m, a 20% year-on-year increase.

Pakistan: Naheed Memon to chair Thatta

Thatta Cement has appointed Naheed Memon as the chairperson of its board of directors. She succeeds Khawaja Muhammad Salman Younis, who left the role on 23 September 2019.
Georgia: Raysut plans 2Mt/yr plant

Ona new 2Mt/yr integrated cement plant near Tbilisi with an investment of US\$200m. Raysut Cement's subsidiary Pioneer Cement is managing the project. It owns a concession to a limestone mine in the country that will be used to support the proposed plant. Construction work at the site is scheduled to start in mid-November 2019.

India: Dalmia Bharat's planned upgrades total US\$492m

Dalmia Bharat Cement will invest US\$492m in projects to expand its cement production capacity by 8Mt/yr to 34Mt/yr from 26Mt/yr. The sum includes a consolidated investment of US\$422m in brownfield developments in Eastern India to increase integrated capacity at its Rajgangpur plant in Odisha by 3.0Mt/yr, and at its Kasba plant in West Bengal by 2.7Mt/yr, to 6.6Mt/ yr and 4.0Mt/yr respectively. The expansion is scheduled for completion by March 2020.

Kazakhstan: Steppe's third quarter revenue slips

Steppe Cement has announced that its revenue fell by 10% year-on-year during the third quarter of 2019 to US\$27.0m from US\$29.9m on the back of lower sales volumes. The UK-listed, Kazakhstan-based construction materials producer said that sales volumes for the quarter fell by 11% to 576,692t. For the first nine months of 2019, Steppe Cement's revenue rose by 10% to US\$630m.

India: Dalmia: carbon negative by 2040

Dalmia Cement has revealed its commitment to dropping its net CO₂ emissions to below 0t/yr by 2040 as part of its new 'Future Today' branding. The company's plan consists of a transition to renewable power by 2030 and the adoption of plant matter and refuse-derived fuel (RDF) for 100% of its fuel needs. Dalmia's 4.0Mt/yr integrated Ariyalur cement plant in Tamil Nadu will receive a 0.5Mt/yr carbon capture and storage facility in 2022 at the latest. The UKbased Carbon Clean Solutions will provide technology and operational services for the installation, the largest in the cement industry. Mahendra Singh, managing director and CEO of Dalmia Cement, has expressed the hope that its product should become 'the World's greenest cement.'

Cambodia: November opening for plant

Thai-based Thai Boon Rong Cement is conducting pilot testing at its newly constructed 1.3Mt/yr integrated cement plant in La'ang, Kampot province, with a view to it entering production in November 2019. Asia News Network has reported that the cement plant, located in the Thai Boon Rong Special Economic Zone, will be the fourth in Kampot, bringing the province's total production capacity to 6.4Mt/yr. Fellow producer Chip Mong Insee, whose plant in Kampot, owned jointly with Siam City Cement, produces 1.5Mt/yr of cement, released a statement expressing hope that the new plant will help to "slash imports by a great amount, which means that we can be nearly 100% self-reliant."

Including the fifth plant in Battambang, Cambodia's cement production capacity will stand at 8.2Mt/yr as of the November 2019 inauguration of the new plant by Prime Minister Hun Sen. The figure confronts a rapidly growing domestic demand which is 7.7Mt/yr and shows no signs of slowing. Figures from Chip Mong Insee estimate that national cement demand in 2020 may be as high as 9.0Mt/yr.

Pakistan: Sales fall for Gharibwal Cement

Gharibwal Cement has blamed reduced exports due to tensions on the Pakistan-Indian border and rising input costs for a reduction in its sales. Its net sales fell by 3% year-on-year to US\$72.3m in the year to 30 June 2019 from US\$74.5m in the same period in 2018. Its cement despatches fell by 11.4% to 1.68Mt from 1.89Mt. Its earnings before interest, taxation, depreciation and amortisation (EBITDA) dropped by 6.5% to US\$18.7m from US\$20m.

The cement producer said that work on a new 0.15Mt clinker silo is in progress and this is expected to be completed by June 2020. It is also building a rainwater reservoir to capture precipitation for use in the production process. The company operates a 2.1Mt/yr integrated plant at Ismailwal in Punjab Province.

Pakistan: Pioneer's sales fall by 4%

Pioneer Cement's sales fell by 4% year-on-year to US\$62m in the year to 30 June 2019 from US\$64.5m in the same period in 2018. Its costs and expenses grew by 7% to US\$3.4m from US\$3.2m. Its profit after taxation halved to US\$5m from US\$10.5m. The cement producer operates a 2Mt/yr integrated plant at Chenki in Punjab Province.





Democratic Republic of Congo: Maiko plant construction proceeds

The government has decided to resume the construction of the Maiko cement plant in Kisangani. Industry Minister Julien Paluku said that contracts were already underway with a new partner to continue the work, according to Radio Okapi. Work on the 1Mt/yr plant started in 2007 with an investment of US\$250m. China's Satarem Hong Kong was previously linked to the project as an investor.

Morocco: LafargeHolcim Morocco and Ciments du Maroc grow sales

afargeHolcim Morocco's net profit in the first half of 2019 was Euro90.6m, representing an increase of 8.6% year-on-year from Euro83.5m in the six months to 30 June 2018. Its revenue held steady year-on-year with a 0.2% increase to Euro366m from Euro365m. It continues its ambitious renewable power plan with an 80% increase in its use of wind power.

HeidelbergCement's Moroccan subsidiary Ciments du Maroc improved its net profit restated for exceptional items by 3.4% year-onyear to Euro55.3m from Euro53.6m in the first half of 2018. Its 2019 first-half revenue improved by 5.0% to Euro191m from Euro183m in the same period of 2018, which it said was due to a record 55% year-on-year increase in clinker sales.

UAE: Shajrah Cement elects new chair

The board of Sharjah Cement and Industrial Development elected Othman Mohammed Sharif Abdullah as its new chairman at a meeting on 12 October 2019. Mubasher has reported that the company, which is based in the UAE, and is also listed in Kuwait, also appointed Salah Abdulla Al Noman to its board.

Saudi Arabia: Al Jouf converts second line to white cement production

A I Jouf Cement has signed a six-month technical contract with China's Riga Company to convert its second production line to produce white cement. The contract was signed to coincide with the arrival of the project team that will handle the conversion. No value for the upgrade has been disclosed.

Nigeria: Dangote targets 62Mt/yr total capacity

A liko Dangote, the chairman of Dangote Cement, plans to increase his company's cement production capacity in Africa by 29% to 62Mt/yr. It aims to add 6Mt/yr in Nigeria in 2020 to support exports to grinding plants in Cameroon and West Africa, according to Bloomberg. The cement producer previously said it had a production capacity of 45.6Mt/yr in 2018 from operations in 10 countries.

Tunisia: Carthage forecasts profit boom

Cin its financial indicators as it forecast a gross operating income of US\$25m for 2019. This would represent a 123% improvement from US\$11.2m in 2018. Ibrahim Sana, Carthage Cement's CEO anticipates a gross operating income as high as US\$55m in 2023, with a targeted turnover of US\$140m.

The company also announced a 0.1Mt export contract for cement to be sent to Spain.

South Africa: PPC-commissioned study shows deficiency of cements on market

Research carried out by Beton-Lab on the instigation of PPC has revealed a widespread flouting of cement quality regulations, with the majority of samples overweight or underweight and of inconsistent quality. Beton-Lab tested 14 products from 10 different producers.



Saudi Arabia: Yamama to sell lines

Yamama achieved a US\$12.2m third quarter net profit in 2019. This compares with losses of US\$12.3m in the corresponding three months of 2018. The company reported a 73% leap in revenues year-on-year to US\$49.7m from US\$28.7m.

Tanzania: Huaxin joins ARM divestment gold rush

China's 100Mt/yr-capacity Huaxin Cement has bought Maweni Limestone from the Kenyan-based Athi River Mining (ARM) Cement. Huaxin has stated that this first incursion into East Africa is 'integral to its broader strategy' of expansion into emerging markets. It adds the Tanzanian producer of 'Rhino' cement to its burgeoning portfolio of overseas assets including cement plants in Tajikistan, Uzbekistan, Cambodia and Nepal.

Kenya: New ownership enters ARM cement plant

The new owners of Athi River Mining Cement entered the company's 0.7Mt/yr integrated Kaloleni cement plant on 14 October 2019. The Standard has reported that Narendra Raval, chairman of Devki Group, which also owns National Cement, was held up because security guards had not received orders to let him in. Raval spoke to employees, promising that all 1100 would keep their jobs following completion of the takeover, whereupon all salaries would be 'harmonised' with those of their National Cement colleagues.

Oman: Raysut signs Duqm deal

Raysut Cement, Oman's leading cement producer, has taken a step forward in the implementation of its 1Mt/yr Duqm grinding plant plans by securing a land lease and port of terminal services agreement from the Port of Duqm. Raysut chief executive Joey Ghose has said that the Duqm unit will help to secure Raysut's presence 'in Oman and the neighbouring Gulf markets,' as well as support strategic investments oversees. Raysut's 6.4Mt/yr integrated capacity extends from East Africa to the Caucasus. The company has India as its next phase expansion target.

Oman: Oman Cement appoints consultant for Duqm project

Oman Cement has engaged the services of a leading consulting company for construction of its 1.8Mt/yr integrated cement plant in Duqm. The company announced the appointment of the consultancy firm to its US\$212m project, which has been ongoing since December 2018, on 12 September 2019.

Zambia: Lafarge Zambia lobbies government

Jimmy Khan, the chief executive officer of Lafarge Zambia, has complained about production overcapacity and competition to the president of Zambia. He said that local cement consumption is 2.2Mt/yr compared to production of 5Mt/yr, according to the Lusaka Times newspaper. He made the visit to the president of the country to inform him of a 25% rise in the price of cement. Khan blamed the price hike on business losses. He praised the government for its infrastructure development and said that the subsidiary of Lafarge-Holcim has moved much of its despatches from road to railway. At present the cement producer has a 33% market share. It also intends to continue using the Mpulungu Port in Northern Province to export cement to the East African market.



Namibia: International Cement Group cancels Schwenk Namibia deal

Singapore's International Cement Group (ICG)'s intended purchase of Schwenk Namibia for US\$104m has fallen through. The company stated that it will not buy the subsidiary of Germany's Schwenk Zement, whose 1.0Mt/yr total integrated capacity consists of Ohorongo Cement's Walvis Bay plant, over four months ahead of the deal's long stop date of 31 January 2020. The deal's deadline had previously been extended from 30 June 2019 following the Singapore Exchange forestalled the deal due to ICG's inability to pay for the unprofitable company.

Kenya: EAPCC sacks staff

East Africa Portland Cement Company (EAPCC) dismissed its entire management staff except managing director Simon Peter Ole Nkeri with one month's notice on 19 September 2019. Business Daily has reported that the company will seek to rehire a small proportion of the personnel with a 60% pay cut. The downsized management team will oversee the redundancy of its entire junior staff, to be partly taken back on with a view to reducing the total employees by 25% to 600 from 800.

EAPCC's staff costs in the second half of 2018 were US\$38.5m, equivalent to 80% of its net revenue in that period. Its anticipated land sales are expected to exceed the US\$52m needed to clear its outstanding debts. Shareholders in the company include LafargeHolcim (42%) and the Kenyan government (52%).

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Global Cement staff

Preview: 24th Arab-International Cement Conference & Exhibition

The 24th Arab-International Cement Conference & Exhibition will take place at the InterContinental Cairo City Stars in Cairo, Egypt on 24-26 November 2019. The event once again boasts an impressive exhibition rosta, 45 confirmed presentations and has more than 400 delegates registered as at 27 August 2019. Here we present its 110+ exhibitors.

Company	Stand No.	Company S	tand No.
Air Jet	H11	CTP TEAM srl	D6
Al-Ghanem Trading & Contracting	D8-D10	Delfin srl	F13
	& E6-7	DI MATTEO Förderanlagen	H10
ALAT Import & Export Co. Ltd	G12	DISAB Vacuum Technology	E7
Alex Group	A33	DURAG GROUP	F12
Arab Swiss Engineering Company	A12-13	ECTP Refractories	E6
Arkan Building Materials PSJC	C5	ESTANDA	G6
ASCOM Geology & Mining	D7	Filter Melco A1	& A35-37
ATD-Abbausysteme GmbH	E13	Fives FCB	C2
AUMUND Foerdertechnik GmbH	D1	FLSmidth A/S	D13-14
Bedeschi SpA	D10	FONS Technology International	H2
Beijing Yueji Industry	H6	FTT Wolbrom SA	D9
BEUMER Group	K5	Gambarotta Gschwendt srl	E8
Bosch Rexroth	G10	Gebr. Pfeiffer	D8
BWF Envirotec	A20	Global Cement	Н3
Cemengal	A17	Hangzhou HOTA M&E Industry	B2
Cement Engineering SA	B1	HAVER & BOECKER	A8
Cement Product Industry (CPI)	A19	HISCO	A27
Cement Service Industries (CemServ)	A6	Höganäs Borgestad	С9
Chongqing General Industry	H7	Howden Solyvent Ventec	A18
Christian Pfeiffer Maschinenfabrik	C8	Huangshan Zhongyou Chain Manufactur	e E14
CICSA	K3	IBAU Hamburg	A8
Claudius Peters Projects GmbH	D2	Industrial Services Center	C3-4
CMD Gears & FERRY CAPITAIN	A11	Intercem Conferences	A23
CNBM KIVAY International Engineerin	ng E2-3	Intercem Engineering	C1
CNBM Smart Industry Technology	H8-9	Intermaint	E1 & E16
COGITECH srl	A31	Işıklar Paper Sack / Cemas	G7
Çorum Teknik Çelik Döküm Makina	H1	Jiangsu Blue Sky Environmental Protectio	n F3
		Jiangsu Pengfei Group	E5 & E12

Below: The pyramids at Giza, close to Cairo.



Global Cement	H3
Hangzhou HOTA M&E Industry	B2
HAVER & BOECKER	A8
HISCO	A27
Höganäs Borgestad	С9
Howden Solyvent Ventec	A18
Huangshan Zhongyou Chain Manufacture	E14
IBAU Hamburg	A8
Industrial Services Center	C3-4
Intercem Conferences	A23
Intercem Engineering	C1
Intermaint E1	& E16
Işıklar Paper Sack / Cemas	G7
Jiangsu Blue Sky Environmental Protection	F3
Jiangsu Pengfei Group E5	& E12
Jordan Paper Sacks Company - Mondi Jordan	A3-4
Kaloon Analytical Instruments (Beijing)	D11
KHD Humboldt Wedag	K1
KREISEL	D5
Kunshan Wanruida Industrial Textile	C7
Lindner-recyclingtech	A25
Longyan City Taimei Wear-resistant Alloys	F5
LTD PetroCem	G2
Luoyang Pengfei Wear Resistant Materials	A10
Luoyang Zhili New Materials	G8-9
Lydall Industrial Filtration Textile	
Manufacturing EMEA A1 & A	35-37

GLOBAL CEMENT: EVENT PREVIEW





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Left: Dignitaries make a tour of the exhibition stands at the 23rd Arab-International Cement Conference & Exhibition, in Amman, Jordan in November 2018.

Company	Stand No.	Company	Stand No.
Maize and Blue General Trading	A5	Sinai Cement Company	A7
MAN Energy Solutions	C6	Sinoma Overseas Development	A30
MAPEI Group	B3	Sinoma Science & Technology	F15
Maschinenfabrik Köppern	K2	Sinoma-CDI	G4-5
Maxtech - Filtersense	D4	SORPA - SORMAS	A9
MDG Handling Solutions	D3	Suzhou Huilong Purification Filter	D12
Metalkarma Engineering Technologies	H4	The Siam Refractory Industries	A2
Minatrade International	E4	thyssenkrupp Industrial Solutions AG	F10-11
MVW Lechtenberg & Partner	E9	Turkish Cement Manufacturers Associat	tion F6
Özek Makina Rotary Kiln Services	F7	VDZ	K6
Partner Teknik	F1 & F16	Vidmar RM 2000	E15
PEG SA	B4	WL Gore & Associates	B5
Redecam Group SpA	F8-9	Wieland Lufttechnik	F2
Refractarios Alfran	G1	Xiamen Savings Environmental	A15
Refratechnik Cement GmbH	A21-22	Yangzhou Kiln Yinyan Combustion Equ	ipment G3
RHI Magnesita	A29 & A34	Yanpai Filtration Technology	E10
Seven Refractories srl	E4	Zemdes GmbH	F1 & F16
Shakespeare Foundry	A16	Zhejiang Haokai Filter	A32
SIBILIA srl	E4	Zhejiang Heading Environment Technol	ogy A14
SIG SpA	F4	Zibo Luzhong Refractory	F14 🅎

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Peter Edwards, Global Cement Magazine

Cement in the GCC and Egypt



This article looks at the cement sectors of the six Gulf Cooperation Council (GCC) nations to coincide with the 24th Arab-International Cement Conference & Exhibition, as well as an update about host nation Egypt.

he Cooperation Council for the Arab States L of the Gulf, colloquially known as the Gulf Cooperation Council (GCC), is a regional political and economic union of six nations: Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, and the United Arab Emirates (UAE). Established in 1981, the GCC's members are all Arab monarchies that have historically relied on oil revenues to fuel their economies. The two other Arab monarchies, Jordan and Morocco, are in discussions with the GCC regarding membership. Yemen had been due to join the GCC in 2015 but has not done so to date.

BAHRAIN 1.2Mt/yr 0.8%

5.0Mt/yr



Over the past 38 years, the GCC has fostered links between the six member states on a number of levels. It has operated a shared military arm since 1984, a common market since 2008 and a customs union since 2015. Discussions towards monetary union, scheduled to be realised in 2010, took a knock in 2006 when Oman said it could not be ready in time. The project received another blow in 2009 when the UAE withdrew from the project after it was announced that the planned central bank for the new currency would be in Rivadh rather than in the UAE. Plans for

Country	Integrated (Mt/yr)	Grinding (Mt/yr)	Total (Mt/yr)
Saudi Arabia	70.4	2.0	72.4
UAE	30.1	9.7	39.8
Qatar	13.6	0.9	14.5
Oman	7.2	1.7	8.9
Kuwait	5.0	0.0	5.0
Bahrain	0.8	0.4	1.2
TOTAL	127.1	14.7	141.8

a full single market were also delayed at around the same time, ostensibly due to the financial crisis. Over the longer term, the GCC's other aims include GCCwide approaches to tourism, legislation, scientific and technical research, agriculture, water resources, encouraging diversification away from the oil sector and 'strengthening ties between its people.'

GCC cement by country

There are 40 active integrated cement plants in the GCC that share a total of 127.1Mt/yr of capacity. There are also 12 grinding plants that add a total of 14.7Mt/yr of capacity. This takes the GCC's total to 141.8Mt/yr across 52 facilities. The Saudi cement sector is the largest in the GCC, with 72.4Mt/yr across 19 integrated and two grinding plants. This represents just over half (51.1%) of the GCC's cement capacity. The second-largest cement industry in the GCC is that of the UAE, which has 13 integrated plants (30.1Mt/yr) and seven grinding plants (9.7Mt/yr), which combine to give it 39.8Mt/yr. The six national cement sectors are shown in Table 1 and Figure 1.



Above and right - Figure 1 & Table 1: GCC countries, ranked according to installed cement capacity in 2019. Source: Research towards Global Cement Directory 2020.

Far right: Saudi Arabia has the largest cement sector in the GCC.



Rank	Company	Capacity (Mt/yr)	Headquarters
1	Southern Province	15.7	Saudi Arabia
2	Qatar National CC	13.6	Qatar
3	Saudi Cement	6.4	Saudi Arabia
4	Najran Cement	6.3	Saudi Arabia
5	Yanbu Cement	5.7	Saudi Arabia

Above - Table 2: Top five cement producers in the GCC by installed capacity. Source: Research towards *Global Cement Directory 2020*.

GCC cement producers

The GCC is unusual in that its cement sector is dominated by small local and regional players, often with just one cement plant. Figure 2 shows that producers with just one site operate 24 cement plants in the GCC, sharing a total capacity of 70.6Mt/yr, 51.9% of capacity. Locally-owned producers with multiple sites operate a further 52.5Mt/yr of capacity across 20 plants, giving local producers a total of 123.1Mt/ yr, 86.8% of the GCC's capacity. Indian producers operate four cement plants in the GCC, sharing 7.9Mt/yr (5.6%) of the region's capacity.

The two global multinationals present in the region are LafargeHolcim and Cemex, which have stakes in plants with 9.2Mt/yr of capacity. Cemex operates 1.6Mt/yr of capacity outright via a single grinding plant, making it the smaller of the two. When LafargeHolcim's minority stakes are taken into account, it operates 3.3Mt/yr of capacity via three different interests. Combined the two multinationals shares come to 4.9Mt/yr, around 3.4% of the GCC's capacity. Local players hold the remaining shares in these plants.





Saudi Arabia

With 72.4Mt/yr of capacity, Saudi Arabia has by far the largest cement sector in the GCC. It almost entirely comprises

Saudi-owned companies, the largest being Southern Province Cement (SPC), which has three plants and a total capacity of 15.7Mt/yr. SPC is also the largest individual producer by installed capacity in the GCC. Saudi cement producers are shown in Table 3.

Recent trends

Despite its high capacity, the Saudi cement market has suffered from overcapacity in recent years, making 45Mt in 2018 according to the USGS, a 4.4% decrease compared to 2017 when it made 47.1Mt. The 2018 utilisation factor was around 63%. The country had previously made as much as 61.9Mt in 2015. The reduction in cement production has been predominantly due to delays to major government infrastructure projects.

The combined net profit for 15 listed cement companies in Saudi Arabia was US\$185m in 2018, around a tenth of value seen in 2014, according to Bloomberg. The situation has improved somewhat since the relaxation of export regulations in July 2017, with 25Mt exported in the two years to July 2019. Previously scarce, Saudi-made cement can now be found all around the GCC, as well as further afield. Abdul Rahman Hussein, from the Ministry of Trade and Investment, noted that 53 cement

> export licences were issued between July 2017 and July 2019, with 22 issued since the start of 2019. At the same time he warned that, following a two year tax holiday, the government was now looking to charge exporters for taking cement out of the country.



In the first half of 2019, the major Saudi cement producers have reported improved fortunes. SPC's sales revenue rose by 37% year-on-year to US\$165m in the first half of 2019 from US\$121m in the same period in 2018. Its net profit after Zakat and tax grew by 53% to US\$56.3m from US\$36.8m. Number two producer Saudi Cement's sales revenue rose by 26% to US\$194m in the same period, with its net profit after Zakat and tax rising by 12% to US\$59.9m. Third-placed Najran Cement's sales also improved by 20%, to US\$48.7m, with a profit after Zakat and tax of US\$920,000. Najran separately announced that it would increase production by restarting one of its three kilns in June 2019. While not explicitly stated by these producers, it is likely that increased exports have helped many cement producers in Saudi Arabia.

Recent news

Denmark's FLSmidth revealed that it is working on a project to convert a grey cement production line at Al Safwa Cement to a dual white and grey line in June 2019. The modified kiln is expected to be commissioned in early 2020. The production objectives are to produce a minimum of 2000t/day white clinker with a maximum heat consumption of 1380kCal/kg clinker. No value for the project has been disclosed. A white kiln conversion is also being carried out at Al Jouf Cement, which signed a non-binding memorandum of understanding with China's Riga Company in April 2019.

Yamama Cement is also upgrading its production facilities, by selling its five old kilns as part of a move to a new site. The five kilns were 'temporarily' shut in 2017 due to economic conditions, but remained uneconomic in the longer term, prompting Yamama to offer them for sale in October 2019. The company is in the process of building a new 6.4Mt/yr plant near Riyadh with two dry lines from thyssenkrupp Industrial Solutions.



Below right: Skyline of Riyadh, capital of Saudi Arabia.

Below - Table 3: Saudi Arabian cement producers. Source: Research towards *Global Cement Directory 2020.*

Producer	Plants	Capacity (Mt/yr)
Southern Province	3	15.7
Saudi Cement	2	6.4
Najran Cement	2	6.3
Yanbu Cement	1	5.9
Arabian Cement	1	4.2
Qassim Cement	1	4.2
Al Safwa Cement	1	4.0
Saudi White Cement	1	3.7
City Cement	1	3.6
Eastern Province	1	3.5
Al Jouf Cement	1	3.5
Tabuk Cement	1	3.2
Northern Region Cement	1	2.0
Umm Al Qura Cement	1	2.0
United Cement	1	1.9
Hail Cement	1	1.6
Al Gharibah Cement	1	0.7
TOTAL	21	72.4



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UAE

The UAE has a diverse cement sector (Table 4), with Omani, Indian and local players, as well as LafargeHolcim



and Cemex. Like its larger neighbour Saudi Arabia, the UAE has struggled with cement overcapacity recently as its rampant construction finally slows

down. The UAE only consumes half the cement that it can make, around 21Mt in 2018. Cement is exported to other GCC countries, as well as to Africa.

Finances in 2019

Arkan Cement's profit grew in the first half of 2019 due to the sale of a previously closed 1.0Mt/yr integrated plant in February 2019. Arkan also benefited from cost controls and an insurance claim. Its profit more than doubled to US\$12.4m in the first half of 2019 from US\$4.67m in the same period in 2018. However, its sales revenue fell by 9.6% to US\$79m from US\$85.2m. It blamed 'price pressure' due to a declining export market. RAK Cement's sales fell by 20% year-on-year to US\$254m in the first half of 2019, compared to US\$31.7m in the first half of 2018. Its profit fell by 79% over the same period to US\$29.1m.

Recent news

The overcapacity in the UAE cement market appears not to have deterred Fujairah Natural Resources, which announced in February 2019 that it would invest in a new US\$150m integrated plant in Habbab, Fujairah. However, a financing failure put a stop to RAK Cement's intended US\$123m purchase of the JK White Cement plant and its associated quarry, also in Fujairah, in September 2019.

Producer	Plants	Capacity (Mt/yr)
Arkan Cement	1	5.7
Union Cement (Shree Cement)	1	4.8
Star Cement (Aditya Birla)	1	4.5
Gulf Cement	1	3.6
National Cement (44% LH)	2	3.5
Lafarge Emirates (50% LH)	1	3.2
Fujairah Cement	1	2.4
Binani Cement (UltraTech)	1	2.0
Sharjah Cement	1	2.0
Pioneer Cement (Raysut Cement)	1	1.7
Cemex	1	1.6
Teba Cement	1	1.2
JK White Cement	1	1.0
RAK Cement	1	1.0
Jebel Ali Cenent	1	0.8
RAK White Cement	1	0.8
TOTAL	17	39.8

To better navigate this oversupplied market, Arkan subsidiary Al Ain Cement and National Cement signed a clinker offtake deal in July 2019. Al Ain Cement will supply clinker from its plant in Al Ain to National Cement's Abu Dhabi grinding plant.

Finally, UltraTech Cement has been trying to offload Star Cement since May 2019. It has not yet found a buyer. The Star Cement assets came as part of the larger Binani Cement acquisition between the two Indian enterprises in 2018.



Right - Table 4: Cement producers in the UAE. LH = LafargeHolcim. Source: Research towards *Global Cement Directory 2020.*

Right: National Cement's integrated cement plant in Dubai, UAE. Source: Kritish Shetty, entrant into the *Global Cement Photography Competition*.

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Qatar

The cement sector of Qatar is dominated by Qatar National Cement Company (QNCC),



which operates four distinct integrated plants, all at Umm Bäb. These share a combined 8.6Mt/yr of cement capacity, with sizes ranging from 0.6Mt/ yr to 5.0Mt/yr. QNCC has operated in Qatar since 1965, when it opened its first plant. The company opened its second plant in 1998 (0.6Mt/yr) (having previously extended the first) and opened the third (1.4Mt/yr) in 2007. Plant four (5.0Mt/yr) came online in 2009 and plant five (1.6Mt/yr) began operations in late 2018. Plant one, which had a capacity of 0.3Mt/yr, has since been closed. QNCC made its first white cement in December 2018. In April 2019 it announced that it was preparing to export up to 3Mt/ yr of cement from its combined operations. Quite where this will all be used is an open question, given the overcapacity affecting the wider GCC region.

Below: Skyline of Doha, the capital of Qatar.



Right: Kuwait Cement Company. Source: Kuwait Cement Company website. The second-largest cement producer in Qatar is Al Khalij Cement, part of Qatari Investors Group, which operates a 5.0Mt/yr integrated plant, also in Umm Bäb. It commissioned its first 2.5Mt/yr FLSmidth line in 2007 and added a second in 2015. The third and final player in the Qatari cement industry is Al Jabor Cement Industries, which operates a 0.9Mt/yr grinding plant in Doha. It is 25% owned by LafargeHolcim.

Recent finances and news

QNCC recorded sales of US\$2.2bn in 2019, with a net profit of US\$903.5m. The revenue figure was 18% down year-on-year compared to 2017, when the company saw sales of US\$2.69bn. However, the profit made in 2018 was actually 6.4% higher than the US\$849.2m profit recorded in 2018.

In March 2019, Al Khalij signed a three year deal to supply oil well cement to Qatar Petroleum. The agreement was signed by Qatar Petroleum's Executive Vice President Mohamed Al Marri and Qatari Investors Group CEO Raja Assili. The plant obtained its API Monogram in November 2018.

Kuwait

There is one integrated cement plant in Kuwait, operated by Kuwait Cement Company. The 5.0Mt/yr plant is located in Shuaiba and started



out as a 0.3Mt/yr grinding plant in 1972. It underwent various upgrades over the years before gaining its own kiln in 2009.

ACICO is in the process of building a 1.0Mt/ yr grinding plant in Kuwait. A 5200 Kws ball mill with all the peripheral equipment from Cemengal and a fourth generation XP4i-130 classifier from Magotteaux were contracted in February 2019 to complement a prior order. The plant is expected to be commissioned in the first half of 2020. It may face a tough market given that Saudi and Iranian cement producers are increasingly targeting the Kuwaiti market. Saudi-based Qassim Cement made its first exports to Kuwait in March 2019.

Recent finances and news

Kuwait Cement's profit fell by 19% year-on-year to US\$10.2m during the second quarter of 2019 and fell by a third in the first half of the year to US\$14.9m. The company noted that the decline in first half profit was attributed primarily to lower income from its investments, as well as to a drop in cement revenues.



Meanwhile, Kuwait Cement hired Belgium's Magotteaux to modernise three of its cement mills in March 2019. The project consisted of closing the open circuit with fourth generation XP4i separators, installing new mill internal components, including diaphragms, and adapting a new ball charge gradation. The aim of the project was to increase production, while reducing specific energy consumption and improving product quality.

Oman

There are three active cement plants in Oman, giving it a capacity of 8.9Mt/yr. The largest producer is Raysut Cement (4.7Mt/yr), which



operates one integrated plant (3.0Mt/yr) and one grinding plant (1.7Mt/yr). It acquired the grinding plant, formerly Sohar Cement, in May 2019. Oman Cement operates the largest individual plant, a 4.2Mt/yr integrated facility in Muscat.

Recent finances and news

There will be a fourth cement plant in Oman in the near future, following an agreement between the Port of Duqm and Raysut Cement in late September 2019. The latter will build a US\$30m, 1.0Mt/yr grinding plant having earlier received a US\$50.7m grant from Bank Nizwa to support economic diversification in the Sultanate. In the longer term, Raysut

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is looking to build a 1.8Mt/yr integrated plant, also at Duqm. This larger investment is expected to cost in the region of US\$210m. Raysut appointed a consultant to the project on 12 September 2019.

Aside from its investments at home, Raysut Cement is one of the most geographically diverse cement producers in the GCC. It operates capacity in the UAE, East Africa and the Caucasus, with its sights set on the Indian market in the medium term.

Despite these lofty investment aims, Raysut Cement actually saw a deterioration in its ongoing operations in the first half of 2019. Its revenue fell by 5% year-on-year over the six month period to US\$108m from US\$114m in the first half of 2018.

Oman Cement reported revenues of US\$132m in 2018, a 12% fall year-on-year compared to US\$150m in 2017. Its profit also fell by 24% to US\$19.0m in 2018 from US\$24.9m in 2017.

Bahrain

The smallest cement producer in the GCC, Bahrain, has two cement plants (1.2Mt/yr), the 0.8Mt/yr integrated Falcon Cement plant in Hafirah and the





0.4Mt/yr Star Cement (UltraTech Cement) grinding plant in Manama. Falcon began operation in March 2009 with a capacity

of 0.3Mt/yr but has expanded to 0.8Mt/yr in 2015. Its website states that it will expand to a capacity as large as 1.1Mt/yr during 2019 but there is limited detail regarding progress towards this target.

Far right - Table 5: Cement producers in Egypt. LH = LafargeHolcim. Source: Research towards Global Cement Directory 2020.

Below: View of the Great Pyramids over the skyline of Cairo, venue for the 24th Arab-International Cement Conference & Exhibition.

Egypt

Egypt is predominantly located in Africa, although around 6% of its land area, the Sinai Pen-



not since transpired.





Egypt has a larger cement sector than any country in the GCC, marginally beating Saudi Arabia by 78.3Mt/yr to 72.4Mt/yr. The majority of its capacity was added in the 1970s and 1980s, before the regime of Hosni Mubarak privatised the sector in the 1990s. This time saw an influx of foreign investment, including from the multinationals shown in Table 5. Today Egypt has 23 integrated plants (74.6Mt/yr) and three grinding plants (3.7Mt/yr).

Cement sector - Producers

The story of Egypt's largest cement producers is partly a tale of the country's largest plants. The largest producer is El-Arish Cement, which has a single plant in Beni Suef. Opened in April 2018, the plant has a capacity of 13.0Mt/yr across six identical dry process lines. This plant alone represents around 17% of national capacity.

The second-largest producer is HeidelbergCement, which operates five integrated plants through its subsidiaries Suez Cement (2 plants, 5.4Mt/yr), Helwan Cement (2 plants, 5.5Mt/yr) and Tourah Portland Cement (1 plant, 1.0Mt/yr). Its 11.9Mt/yr capacity provides it with 15% of national capacity.

The third-largest producer is LafargeHolcim, which, like El-Arish Cement, only operates one plant. However, the plant has a capacity of

Right: View of Oman Cement in Muscat. Source: Oman Cement

Far right: Falcon

Cement plant.

Source: Falcon

Cement website.







Producer	Plants	Capacity (Mt/yr)
El-Arish Cement	1	13.0
HeidelbergCement	5	11.9
Lafarge Cement Egypt (LH)	1	10.6
Assiut Cement (Cemex)	1	5.7
Amreyah Cement (InterCement)	1	5.5
Arabian Cement	1	5.0
Misr Beni Suef Cement	1	3.5
Misr Qena Cement (27% ASEC)	2	3.4
Beni Suef Cement (Titan)	1	3.2
South Valley Cement	2	3.1
Alexandria Portland (Titan)	1	2.0
Wadi El Nile Cement	1	2.0
Sinai Cement (41% Vicat)	1	1.9
El Nahda Cement	1	1.7
BMIC	1	1.5
El Sewedy Cement	1	1.5
Sinai White (57% Cementir)	1	1.2
Medcom Cement	1	0.8
SPEGYCO	1	0.6
Royal El Minya Cement	1	0.2
TOTAL	26	78.3

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10.6Mt/yr, sufficient to provide it with 14% of Egyptian capacity.

Recent trends

Egypt's cement sector has been battered by several logistical and economic issues in recent years, in addition to prolonged political uncertainty. Demand took a hit after the Arab Spring and domestic consumption remains far below capacity. This has lowered the price producers can realise in the market.

At the same time fuel shortages, which began in 2013 due to a reduction in government fuel subsidies to heavy industries, have eaten into producer margins from the other direction. The price of mazut, a form of heavy fuel oil, increased by a factor of 2.5 over the six months from January to June 2013. Over the past five years this has prompted a wide-spread switch to coal imports and alternative fuels. While less costly than mazut, Egyptian cement producers are now paying significantly more for fuels than before this change in government policy.

Then, just as a 'new normal' had been established, the government increased energy prices in June 2018, piling further pressure on margins. Cement exports, the refuge of several producers, became uncompetitive. Then, the government-backed 13.0Mt/yr El Arish Cement plant came online in April 2018. It was not well received by other produers and has exacerbated the mismatch between supply and demand. Smaller producers have been feeling the heat in particular, as expanded upon below. However, more recently the government reduced the price of natural gas for cement producers to US\$5 per one million British thermal units (BTU). Previously the price was US\$8. It will now review the price of gas every six months.

Cement sales in Egypt fell by 7.7% year-on-year to 10.9Mt in the first quarter of 2019. Data from the Central Bank of Egypt shows that production fell by 8.1% to 11.2Mt. In August 2019, Medhat Istafanos, the head of the Cement Division at the Federation



of Egyptian Industries (FEI), stated that domestic cement demand was supporting only 40% of local production. He blamed this on a slowdown in building activity and a lack of government-backed infrastructure projects. He reported that only 48Mt of cement was sold in 2018.

Producers are exploring options to increase cement exports. Walid Gamaleddin, the president of the Export Council for Building Materials and the Metallurgical Industries, has called for the government to support industry exports. The minister of trade and industry discussed a programme for cement-export subsidies with officials from the sector in late July 2019 that would include encouraging agreements to export cement to the African countries. The Central Bank of Egypt (CBE) has also instructed the banking sector to support cement companies that need to restructure their debts. The merger of smaller companies to form larger conglomerates has also been encouraged.

However, growing exports of Egyptian cement is challenged by its relative high cost compared to other countries. Istafanos said that Egyptian cement is US\$12/t higher than its competitors.

Recent finances and news

The relentless squeezing of margins in Egypt's cement sector has affected many producers so far in 2019. Misr Beni Suef Cement reported net profits for the six months to 30 June 2019 of US\$2.76m, a massive 78.8% lower than the US\$13.0m that it made during the same period of 2018. This is part of a wider profit slump for Egyptian domestic cement producers, with Misr Cement Qena's first half figure down by 85.2% to US\$0.87m from US\$6.00m a year ago. Elsewhere, South Valley Cement reported losses of US\$6.19m in the first half of 2019, compared to a US\$1.27m profit in the same period of 2018. Meanwhile, Sinai Cement recorded a first half net loss of US\$11.3m, an increase of 20.1% on the loss recorded in the same period of 2018. Suez Cement made a loss during the first half of 2019. Its net

loss reached US\$17.7m over the six month period, from a profit of US\$14.4m in the first six months of 2018. The company generated US\$199m in revenue during the first six months of 2019, compared to US\$238m a year earlier.

In September 2019 Alexandria Portland Cement, one of HeidelbergCement's subsidiaries, was forced to sell land to stave off losses. It sold a 15.9km² parcel of disused land in Ad Dakhila for US\$1.9m. The company made a loss of US\$10.3m in the first half of 2019. Some went even further, with El Nahda Cement taking the drastic step of suspending production at its 1.7Mt/yr plant at Quena for six months in July 2019.

Right: Egyptian producers have been increasingly reliant on (expensive, imported) coal after government fuel subsidies were curtailed in 2013.

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Here Global Cement Magazine presents its monthly review of global cement prices, in US\$ for easy comparison. Additional price information is only available to subscribers to Global Cement Magazine. Subscribe on Page 88. In this issue subscribers receive information from South Africa, Uganda, El Salvador, Congo and elsewhere.

Prices are for metric tonnes (Mt), unless stated otherwise. US\$ conversions from local currencies are correct at the time of original publication.

Bangladesh: Cement prices have fallen in the past three months on the back of lower demand. Prices have fallen by US\$0.47-0.59/bag (50kg) depending on the brand and grade to around US\$5.95-5.43/ bag since July 2019.

China: All-Chinese average cement prices from sunsirs.com: 13 October 2019 = US\$68.61/t; 14-17 October 2019 = US\$68.58/t; 18 October 2019 = US\$68.66/t.

Malaysia: The government will continue to impose anti-dumping duties on imports of fibre-reinforced cement flat and pattern sheets (FCB) from producers and exporters from Thailand, according to a statement from the Ministry of International Trade and Industry on 24 September 2019. It said this included Shera Public Company Ltd (19.74% duty) and The Siam Fibre-Cement Co Ltd (9.15%), with a 31.14% duty imposed on other companies.

Ivory Coast: Cement prices have decreased by 2.5% over the first half of 2019 following an increase in the supply of cement from newly-commissioned plants. The ex-factory price of 32.5 grade cement, which was around US\$134.05/t in the first half of 2018 is now around US\$130.07/t.



land Cement prices as of 18 October 2019: Arabian Cement (Al Mosalah) = US\$47.87/t; Arabian Cement (Al Nasr) = US\$47.25/t; ASEC Cement = US\$47.25-47.87/t; El Nahda Cement (Al Sakhrah) = US\$46.95/t; Lafarge (Al

Egypt: Ordinary Port-

Makhsous) = US\$47.68/t; Medcom Aswan Cement (Aswan) = US\$46.96/t; Arish Cement (Alaskary) US\$47.26/t; = Sinai Cement = US\$46.95/t; Suez Cement US\$47.57/t; Helwan Cement US\$48.31/t; = El Sewedy Cement = US\$48.62/t; Misr Cement Qena = US\$46.96/t.

White cement prices as of 18 October 2019: Sinai White Cement (Alabid Elada) = US\$150.79/t; Sinai White Cement (Super Sinai) = US\$148.95/t; El Menya Cement (Super Royal) = US\$146.18/t; El Menya Cement (Royal Elada) = US\$147.72/t; Menya Helwan Cement = US\$147.72/t.

Blended cement prices as of 18 October 2019: Sinai Cement (Al Nakheel) = US\$42.35/t; El Minya Cement (Royal) = U\$42.35/t; Helwan Cement (Al Waha) = US\$42.77/t.

Sulphate-resistant cement prices as of 12 August 2019: Cemex (Al Mukawem) = US\$52.31/t; ASEC Cement (Asec Sea Water) = US\$50.78/t; Lafarge (Kahger Albehar) = US\$51.70/t; Suez Cement (Al Suez Sea Water) = US\$50.47/t; El Sewedy Cement (Al Mukawem) = US\$51.09/t.

India: The All-India average cement price in September 2019 was volatile, primarily due to prices in the south of India rising by around US\$0.56/bag (50kg) to US\$4.29/bag at the start of the month. It then fell back by around the same amount in the second half of the month. Overall the All-India average price rose by 2% year-on-year compared to September 2018. Price ranges at the end of September 2019 were US\$3.65-4.95/bag in New Delhi, US\$3.51-4.43/bag in Jaipur and US\$4.08/bag and US\$4.08-4.78/bag in Ludhiana.

Do you have your finger on the cement price pulse where you are? If so, *Global Cement Magazine* needs you!

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I m writing this at a height of 8km, flying somewhere over the beautiful north of Italy, on my way back from Thessaloniki in Greece, where I attended the *EuroSlag Conference*. Two startling ideas came out of the meeting; the possibility that CO_2 might come to be treated on the same basis as waste in the waste hierarchy (avoidance being preferred to disposal/sequestration, for example); and the possibility of a net-zero CO_2 iron and steel industry by 2050. It was a useful trip, with good food and a little bit of running and bird-watching as well (each to their own), but I can't help but feel a little bit guilty.

We are all now being told that we should feel guilty about flying and in fact, there's a word for it: 'flygskam,' Swedish for 'flight-shame'. Air transport accounts for 2% of man-made carbon emissions (around 895Mt of CO_2 in 2018). In a warming world, driven by our emissions of greenhouse gases, air travel is firmly in the sights of campaigners and increasingly of politicians, responding to voter concerns. However, air travel is something that we have come to expect as our 'right.' We expect to be able to cross continents in a few hours, to jet off on a family holiday at reasonable cost and to travel to visit customers and contacts wherever they may be. Air travel comes as part of today's 'lifestyle,' along with ubiquitous electricity, WiFi, driving your own car, exotic foods, cheap clothes and plenty more things besides that we take for granted - even to the point where we consider them as 'rights.' Politicians are going to struggle to take away these 'rights' even if we, the voters, really do want action on climate change.

I would argue that it is not air travel *per se* that is what we are being urged to feel guilty about, but the CO_2 emissions associated with it - and it does not have to be this way. I hope that climate campaigners (and in a way we are all climate campaigners now) would be happy if we could transport people and goods around the world with no CO_2 emissions and no environmental impact. It sounds far-fetched, but it might be possible in the future. The first flights have already taken place with bio-jet and other sustainable low- CO_2 fuels, and electric planes are now heading towards production. If politicians want to do something about the environmental impacts of air travel, then they should strongly encourage development of non-fossil-fuel options for air travel. They should not curtail my 'right' to travel.

In the same way, there are 'eco' options for most of the other sources of carbon emissions, which 'just' need to be developed and to become mainstream. The large-scale substitution of renewable energy sources for coal is underway in some countries (but notably not yet in India and China), while there is a growing awareness of the environmental impact of all forms of meat production (but especially beef and lamb), which can be addressed through changes in diet. That does not necessarily mean going vegetarian, but might mean switching to meats with lower environmental impacts such as chicken or pork. As my daughter Elizabeth put it, "It's all about demand." For example, if we - humanity - demand less beef and more chicken, the environmental impact of our diets will drop.

The same goes for building materials. Politicians should only seek to level the playing field, not skew it, by properly reflecting the environmental costs inherent in the production and use of building materials. Building products that are energy-intensive to produce should (and largely do) have that cost reflected in their price (unless, of course, the producers can find cheaper forms of non-fossil energy such as alternative fuels). Building products that aid in energy efficiency, such as all forms of insulation, will be properly priced on the basis of the advantages that their long-term use can bestow on their users. Mineral wool, for example, can save 200 times more energy in use than the energy used to manufacture it - and other types of insulation have similar performance. For the benefits that it bestows, insulation is remarkably cheap.

If the world becomes serious about curbing carbon emissions, then cement production will have to become net carbon zero. That confronts the industry with unique challenges, due to the CO_2 inherently released during the decarbonation step. The good news is that much research has already been undertaken to reduce CO_2 emissions from cement production: alternative fuels, the use of supplementary cementitious materials, waste heat recovery, carbon capture and more.

In the future, our schools, hospitals, bridges and roads can still be built, but they will use net-zero CO_2 versions of today's building materials, with low embodied-energy cement, fully-recyclable materials, air-quality-enhancing wallboards and full insulation. We can continue to live our lives, but we will live them in a low-CO₂ paradigm. This is all possible: As Ella Fitzgerald sang in 1939, *"It ain't what you do it's the way that you do it...*

...and that's what gets results."

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