

[www.globalcement.com](http://www.globalcement.com)

[Contents](#)

[Subscribe](#)

[Ad Index](#)

**global**  
**cement**<sup>TM</sup>  
**MAGAZINE**

**MARCH 2024**

# ON POINT KILN SHELL COOLING

## WITH **KILNCOOLER** STATIONARY

### INFRARED CONTROLLED KILN SHELL - WATER COOLING

- expansion of kiln's operation time
- reduced mechanical tension
- fast, but carefully cooling down
- energy savings

THAT'S WHAT WE CALL THE KIMA PROCESS.

[WWW.KIMA-PROCESS.DE](http://WWW.KIMA-PROCESS.DE)







## Prescriptive Condition Monitoring Made Easy with DALOG Wireless Solution



**3-axis acceleration  
and temperature sensor**



**All-in-one platform solution with  
mail and text notifications**



**Remote machine health assessment  
by DALOG experts**

**dalog.net**





# Boost Machine Availability ✓

Easy  
Trial

W

Contact us and try it out!

**For more information:**

Christoph Muschaweck  
christoph.muschaweck@dalog.net  
+49 821 74777 - 115

**DALOG**®



# global cement MAGAZINE

www.globalcement.com

## Exclusive Official Magazine for

Global CemFuels Conference,  
Global CemCCUS Conference,  
Global FutureCem Conference,  
Global Slag Conference,

...and Global Cement Virtual Events.

### On the cover...

For 28 years **KIMA Process Control** has been working in the field of high performance closed loop controls, innovative sensor systems and databases for processing industries. With **SMARTFILL™**, we set new worldwide standards regarding the precision and reliability of measuring the fill level of ball mills. With the **KILNCOOLER™** another intelligent solution is provided that treats kiln shell hot spots to avoid unexpected kiln stops. With **SMARTCONTROL™** hundreds of mills, both ball mills and vertical roller mills, are controlled based on Advanced Process Control. The same software platform, along with elements of artificial intelligence, is now also used to control rotary kilns. For more high-tech innovations visit our website.

**KIMA Process Control GmbH**

Dirk Schmidt, Director

**Tel:** +49 2463 9967 – 0

**Fax:** +49 2463 9967 – 99



**Email:** schmidt@kima-process.de

**Web:** www.kima-process.de

## Dear readers,

Welcome to the March 2024 issue of *Global Cement Magazine* - the world's most widely-read cement magazine! Flipping through the pages of this issue, there are a couple of news stories of a magnitude that we don't see every week. Firstly, Holcim has made a splash by announcing its decision to strategically separate and list its North American business (Page 48). It's a bit like a cell splitting in two, but instead of duplicating, the entity that results on that continent - at some point in 2025 - will not be Holcim anymore. Given the multinational's recent acquisitions in roofing, insulation, vapour barriers and more, it will be a very interesting mix of building materials' companies looking for an owner (or more likely *owners*). Holcim is obviously convinced that it has assembled an attractive package, but it begs the question: If it's that attractive, why sell?

The other major story also concerns a future divestment that will be even more fundamental for our sector: FLSmidth is planning to sell its cement manufacturing equipment business (Page 43). The company stated that, despite 140 years in the sector, the cement and mining sides of its business had diverged and were now causing more friction than synergy. Its decision to separate the two makes sense. However, selling its cement arm - its very *raison d'être* - speaks volumes about where the 'greenfield cement plant model' finds itself in 2024. Demand for new lines is set to remain low due to entrenched overcapacity. Couple this to the rise of Chinese suppliers and novel technologies, and it appears that FLSmidth has been forced to make a difficult call. The company has expressed its desire to offload the cement business as a single entity, but - in a world that is increasingly looking away from traditional cement production - this may be a tall order.

Enjoy the issue!

*P. Edwards*

Peter Edwards  
Editor

Editorial Director  
**Dr Robert McCaffrey**  
rob@propubs.com



Editor  
**Dr Peter Edwards**  
peter.edwards@propubs.com



Web Editor  
**David Perilli**  
david.perilli@propubs.com



Assistant Editor  
**Jacob Winskell**  
jacob.winskell@propubs.com



Commercial Director  
**Paul Brown**  
paul.brown@propubs.com  
Mobile: (+44) (0) 7767 475 998



Company Administrator  
**Amanda Crow** • amanda.crow@propubs.com

Senior Accounts Administrator  
**Jane Coley** • jane.coley@propubs.com

Views expressed in articles are those of the named author(s).  
For details on submission, see: [www.GlobalCement.com](http://www.GlobalCement.com)

ISSN: 1753-6812

Published by Pro Global Media Ltd

Octagon House, 20 Hook Road,  
Epsom, Surrey, UK KT19 8TR

Tel: +44 (0)1372 743837 / Fax: +44 (0)1372 743838

An official magazine of:



Printed on Programme for the Endorsement of Forest Certification (PEFC®) certified papers by Pensord, a company with ISO 14001:2004 environmental certification.







# cem AI

Cement Intelligence

# Optimizing your cement plant. Empowering your team.

An innovative predictive maintenance solution, CemAI provides early detection of operational anomalies using AI-based software coupled with cement industry expertise.

[www.CemAI.com](http://www.CemAI.com)

## FOR MORE INFORMATION

Please contact us for a presentation and demonstration of what CemAI can do for your company.

[info@cemai.com](mailto:info@cemai.com) | +1 (904) 509 5800



scan here





## Features

### 10 Net-zero progress

The Global Cement & Concrete Association's Executive Cement Director discusses the association's Cement Industry Net Zero Progress Report.

## Technical

### 14 Kamengo: Keeping bins flowing

Derek Vaile, Applications Engineer at Kamengo, shows how producers can eliminate storage and handling issues with difficult-flowing bulk materials.

### 18 Monitoring: The right solution

Schaeffler Lifetime Solutions presents a Turkish monitoring case-study.

### 20 HRB blending

Bikoserwis presents a recent hydraulic road binder case-study from Belgium.

### 24 Report: Pfeiffer Panel Florida

A cement-centric report from the event in Fort Lauderdale in late 2023.

## Concrete

### 32 News

### 34 Enzymatic: Self-healing low-CO<sub>2</sub> concrete

*Global Cement* speaks to Charles Maddox, CEO of self-healing concrete developer Enzymatic.

## Products & Contracts

### 38 News







## Europe 40 News

### 44 German sustainability

A look at sustainability efforts in one of Europe's most technologically-advanced cement sectors.

## Americas 48 News

### Asia 52 News

### 54 Comment on Kyrgyzstan

Kyrgyzstan is an up-and-coming cement market in Central Asia, with strong cement production growth.

## Middle East & Africa

### 56 News

### 58 Plant report: Medcem

*Global Cement* speaks with Medcem's CEO Mehmet Ali Ceylan about his company's past, present and future.

### 64 AUCBM 2024: Reviewed

A detailed report from the event in Cairo, Egypt.

## Regulars

### 71 Global Cement prices

### 72 Subscriptions

### 73 The Last Word

### 74 Advertiser Index







Contents

Subscribe

Ad Index



## **8th Virtual Global CemProducer**

6 March 2024  
FREE Online Event  
[www.CemProducer.com](http://www.CemProducer.com)

## **16th Global Slag Conference**

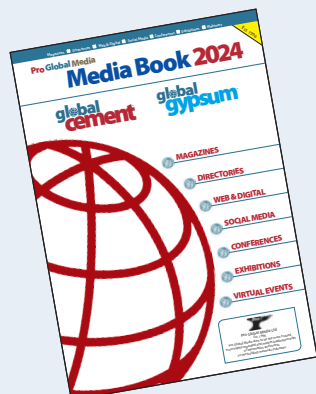
23-24 April 2024  
Dubai, UAE  
[www.GlobalSlag.com](http://www.GlobalSlag.com)

**Institute of Concrete Annual Convention**  
**The Pursuit of Net Zero Concrete**  
11 April 2024 • Birmingham, UK  
[www.theict.org.uk](http://www.theict.org.uk)

**IEEE-IAS/PCA Cement Industry Technical Conference**  
28 April - 2 May 2024 • Denver, Colorado  
[www.cementconference.org](http://www.cementconference.org)

**Download 2024  
Media Information:**

[www.propubs.com](http://www.propubs.com)



## **IFAT Munich**

13-17 May 2024 • Munich, Germany  
[www.ifat.de](http://www.ifat.de)

## **1st Global CemCCUS Conference**

14-15 May 2024  
Oslo, Norway  
[www.CemCCUS.com](http://www.CemCCUS.com)

## **ACHEMA 2024**

10-14 June 2024 • Frankfurt, Germany  
[www.achema.com](http://www.achema.com)

## **Hillhead Quarrying & Recycling Show 2024**

25-27 June 2024 • Buxton, UK  
[www.hillhead.com](http://www.hillhead.com)

## **FICEM Technical Congress 2024**

2-4 September 2024 • Guatemala  
[www.ficem.org](http://www.ficem.org)

## **17th Global CemFuels Conference**

18-19 September 2024  
Dublin, Ireland  
[www.CemFuels.com](http://www.CemFuels.com)

## **26th AFCM Technical Symposium & Exhibition**

4-8 November 2024 • Kuala Lumpur, Malaysia

## **VDZ International Congress**

6-8 November 2024 • Düsseldorf, Germany  
[www.vdz-online.de](http://www.vdz-online.de)

## **18th NCB International Conference & Exhibition on Cement, Concrete and Building Materials**

27-29 November 2024 • New Delhi, India  
[www.ncbindia.com](http://www.ncbindia.com)

## **5th Global FutureCem Conference**

3-4 December 2024  
Brussels, Belgium  
[www.FutureCem.com](http://www.FutureCem.com)



# CO<sub>2</sub> Lime Kilns Innovation

## Driven by Responsibility

As the innovative and passionate world leader in the design and construction of kilns for the lime industry, it's our aim to protect our planet and help our customers act responsibly. This has led to another milestone in our history – the Maerz EcoKiln® series. Its ability to enrich the CO<sub>2</sub>-content in the off-gas up to 95% gives you the full flexibility to choose the right downstream equipment for processing the CO<sub>2</sub> for either sequestration or further utilisation.

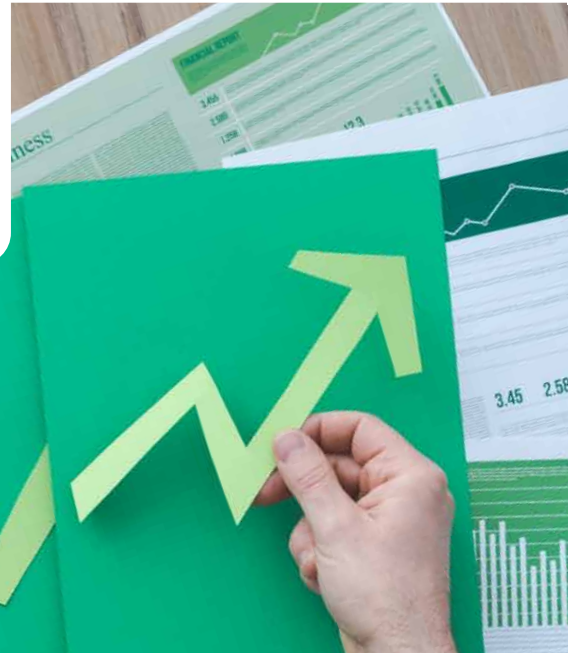
**maerz.com**





Claude Loréa, Global Cement & Concrete Association

## NET-ZERO: PROGRESS



Claude Loréa, the Global Cement & Concrete Association's Cement, Innovation and ESG Director, outlines key findings of its recent Cement Industry Net-Zero Progress Report...

The Global Cement Industry Net-Zero Progress Report (NZPR), published in December 2023 to coincide with COP28 in the UAE, highlights the work of the GCCA and its members to lower their CO<sub>2</sub> emissions since the signing of the 2050 Net Zero Roadmap in October 2021. Initiatives include CO<sub>2</sub> capture, utilisation and storage (CCUS), efficiencies in clinker production, renewable energy and alternative materials (clinker substitution). These strategies have already contributed to a 23% decline in the CO<sub>2</sub> emissions of the cement and concrete sectors between 1990 and 2021. The NZPR is simultaneously an externally-facing report, to show our partners and interested external parties how we are tackling the climate challenge, and also a rallying call to even greater action from our members.

### External stakeholders...

As the GCCA's Executive Director for Cement, Innovation and ESG, the first striking aspect of the NZPR is that so many external partners wanted to be part of the report. This is reflected by the fact that there are no less than seven Forewords, not only from GCCA members and its committee, but from the UN Climate Change High-Level Champion of the COP28 Presidency, the Government of Canada, Leadit, the UN Industrial Development Organization (UNIDO) and Mission Innovation Net-Zero. It is very pleasing that so many external stakeholders wanted to be involved in the report and it really speaks to the essential role of partnerships and collaboration.



## Enabling policies...

A key foundation of the NZPR is the commentary around enabling policies from governments, in whatever form. We need policies, as technical innovations will not transform our sector alone. This includes the Cement Breakthrough, a COP initiative lead by the Government of Canada and the UAE, that will provide avenues to encourage the adoption of innovative technologies, voluntary actions and policy measures. The Cement Breakthrough will mirror other breakthrough groups and develop priority actions among signatory countries in response to the 2023 Breakthrough Agenda report. These actions will guide the work of the breakthrough in 2024 and will be revised cyclically. Other key initiatives launched at COP28 include the Buildings Breakthrough and the Industrial Transition Accelerator, which GCCA and a number of its member companies are fully engaged with.

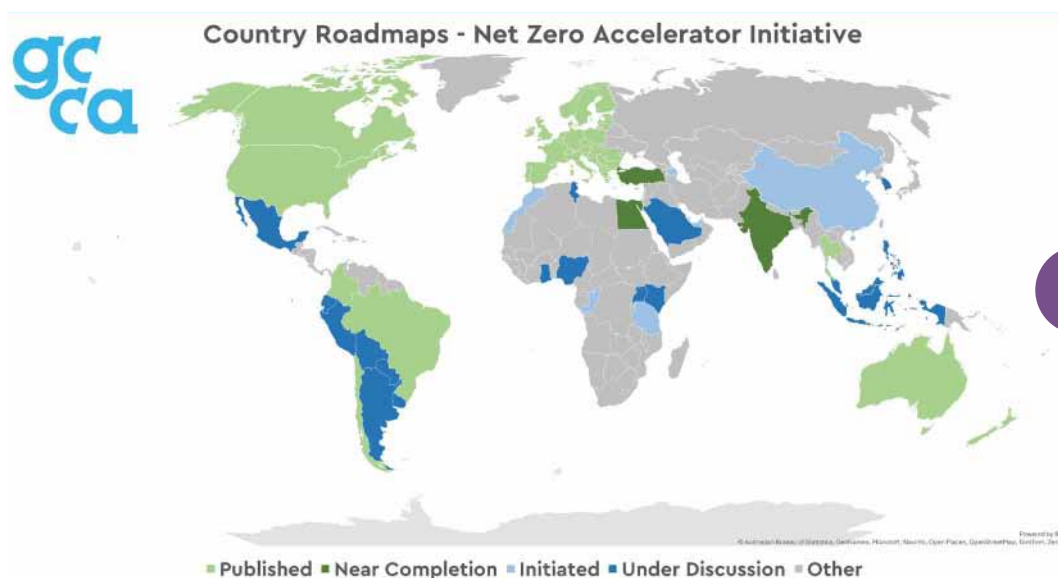
GCCA is front and centre in advocating for policies that enable decarbonisation, but is not prescriptive about how these should be achieved. For example, among the lowest-hanging fruit is the use of alternative fuels (AF) for clinker production. Many countries still have very low levels of AF uptake. This is not necessarily because cement producers don't want to use AF to decrease their emissions, but because AF is not reliably available at a high-enough quality in sufficient quantities. To encourage AF use, governments must set out waste segregation policies, recycling schemes and so on, to drive the development of AF. It is not GCCA's place to tell them *how* to do this, as individual circumstances will vary, but we constantly advocate that they *are* implemented and assist in sharing good policy practices examples.

Similarly, GCCA is engaging ministries in discussions that relate to novel low-clinker cement blends, as these are often not covered by existing building codes and standards, even in developed markets. GCCA is highlighting the fact that these materials are coming down the track and that markets need to be ready for them. Allied to this is the need for policies that drive public procurement of low-CO<sub>2</sub> cement blends. These are an ideal starting point for wider adoption of low-CO<sub>2</sub> blends.

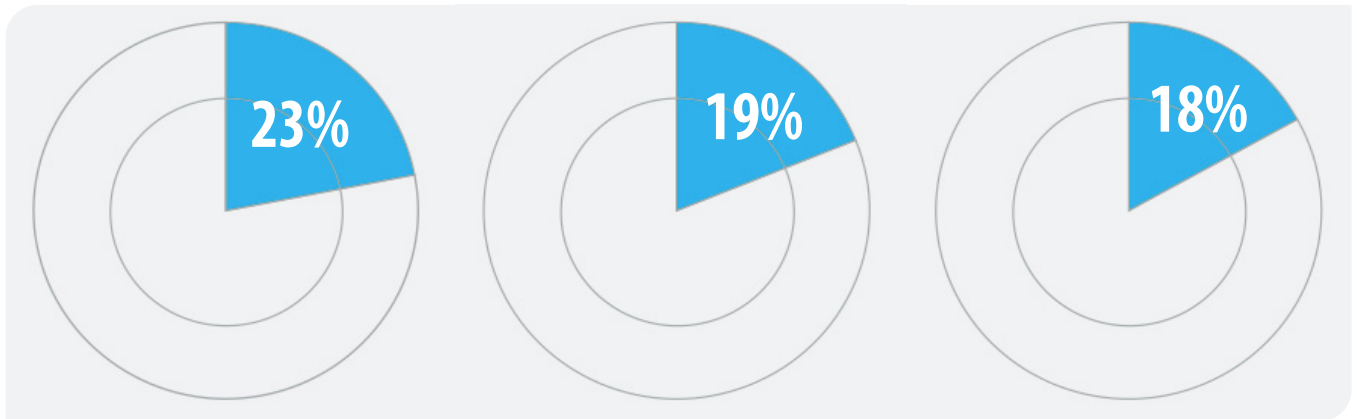
Finally, GCCA is advocating for the adoption of policies to develop CO<sub>2</sub> capture, storage and utilisation (CCUS). This is certainly the area that needs the most development, as up to 36% of the CO<sub>2</sub> emissions reductions called for in the Roadmap will come from CCUS. GCCA advocates for symmetrical policies for carbon-pricing so that CO<sub>2</sub> emissions are not simply exported, but again... we do not advocate for one policy over any other. For example, the EU and US have taken very different policies to carbon pricing: one a cap-and-trade system and one a tax credit.

Elsewhere in the NZPR, the deployment of CCUS is being monitored by the Green Cement Technology Tracker, which is run by the GCCA alongside Leadit. There are many projects ongoing in Europe and North America. This is due to the enabling policies and frameworks, as well as funding, from governments on both sides of the Atlantic.

Part of our advocacy efforts regarding net-zero policies is the development of country-specific roadmaps for net-zero cement and concrete. Figure 1 shows the status of net-zero roadmaps globally. Europe and North America are already committed to net-zero cement and concrete by 2050, as are Brazil, Colombia, Thailand, Australia and New Zealand.



Status of cement and concrete net-zero roadmaps around the world in early 2024.



Reduction in net CO<sub>2</sub> emissions per tonne of cementitious material, 1990 - 2021. 23% figure rounded up from 22.7%.

Energy efficiency improvement, 1990-2021.

Reduction in fossil fuel consumption, 1990-2021.

Many more, including China, India, Egypt, Morocco and Chile, are developing their roadmaps. Others, mostly in developing markets, are in the planning stages prior to initiating their roadmap process.

### Getting the Numbers Right..

The NZPR also draws on data from the latest Getting the Numbers Right (GNR) database. This comprehensive dataset, collected for nearly 20 years using data from individual plants and independently audited by PriceWaterhouseCoopers, is unique among heavy industries for its openness and scope. It shows that net CO<sub>2</sub> emissions per tonne of cementitious material fell by 22.7% between 1990 and 2021, which is the latest year we can report data for due to competition authority considerations. The proportion of AF used globally has risen by a factor of 10 over

the same timeframe, leading to an 18% reduction in fossil fuel consumption. There has also been a 19% improvement in energy efficiency. GCCA looks forward to updating *Global Cement* readers with the 2022 GNR data later in 2024.

### Other sections...

There are also significant contributions on the innovative consortia developed by the GCCA's Innovandi Open Challenges, the third of which will be launched on 20 February 2024. There are also sections that highlight the essential role of the natural world in helping us to meet our net-zero targets. We, as GCCA, are aware that net-zero targets will be impossible if we don't halt biodiversity loss. It is high time for the sector, indeed for the whole of mankind, to come to this realisation.


Breedon Hope cement plant is an instrumental player in the Peak Cluster industrial carbon capture project.





## Member case-studies...

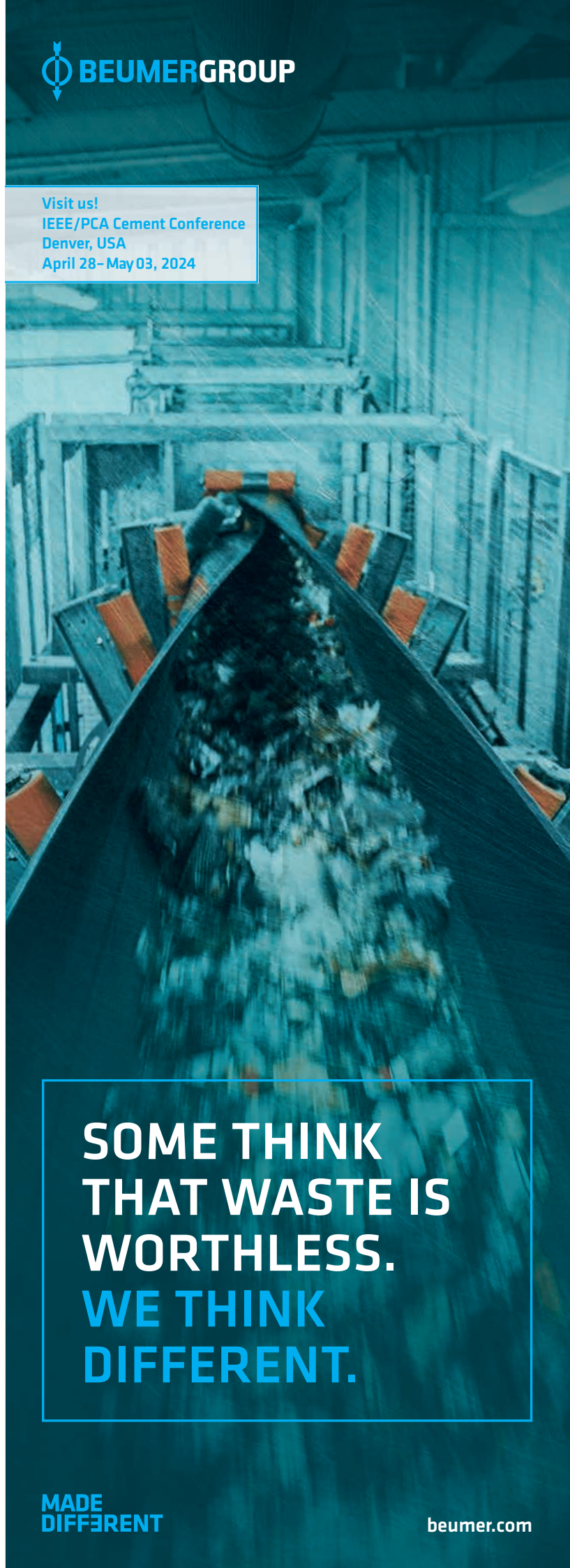
Over half of the NZPR is dedicated to the actions of our members, with a wide variety of different sustainability and decarbonisation topics, from quarry rehabilitation, through AF, low-CO<sub>2</sub> blends and CCUS, to concrete durability in use. Specific case-studies include Breedon's role in the Peak Cluster project, a world-first industrial project to ensure a net-zero future for the cement and lime industries of north west England. Peak Cluster aims to capture more than 3Mt/yr of CO<sub>2</sub> emissions by 2030, making a key contribution to the UK's net-zero ambitions. Also in the NZPR, we highlight: Cementos Argos' use of hydrogen injection to raise coprocessing rates and produce low-CO<sub>2</sub> cement; Cemex's provision of environmental impact disclosure for all of its products; Dangote Cement's AF journey - and future trajectory; The Portland Cement Association's net-zero roadmap; Titan Cement's IFESTOS CO<sub>2</sub> capture project, and; Heidelberg Materials' GeZero project to fully decarbonise production at its Geseke plant in Germany, among many others.

The number, variety and scale of the projects in the NZPR shows the positive actions already being taken by GCCA members and those contained in the NZPR only scratch the surface. Indeed, we had to limit each member to just one case-study! We hope that, by demonstrating the solutions already being developed, other members will be inspired to start their own projects. After all, we all need to row in the same direction to meet our essential climate goals. 

Download the full report at:  
<https://gccassociation.org/cement-industry-net-zero-progress>



Visit us!  
IEEE/PCA Cement Conference  
Denver, USA  
April 28 - May 03, 2024



**SOME THINK  
THAT WASTE IS  
WORTHLESS.  
WE THINK  
DIFFERENT.**



Derek Vaile, Kamengo

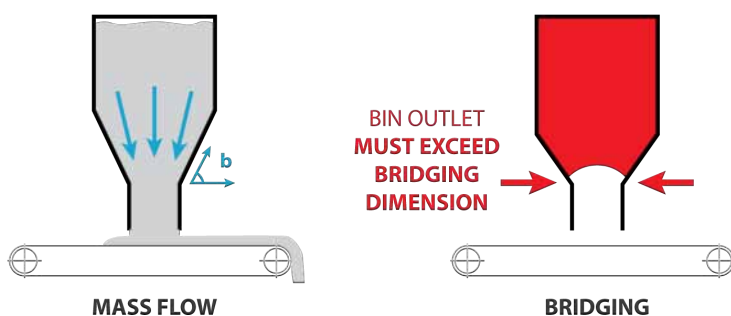
# KAMENGO: KEEPING BINS FLOWING

Derek Vaile, Applications Engineer at Kamengo, shows how producers can eliminate storage and handling issues with difficult-flowing bulk materials.

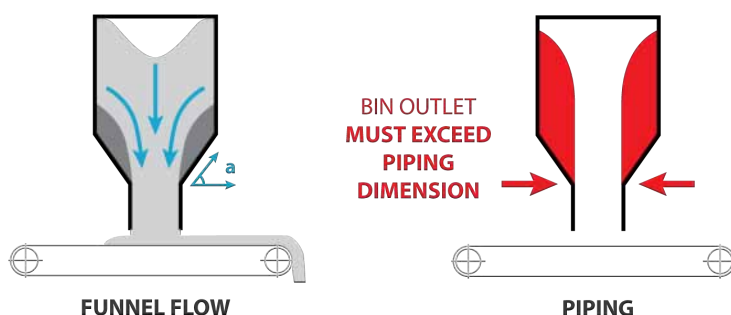
A bin, chute, or silo that suffers from chronic plugging will plague a cement plant with unexpected shutdowns for the life of the equipment. Following an extensive research programme, Kamengo identified three reasons why bins plug:

## 1. Poor bin geometry

For a difficult-flowing material, the geometry of a storage bin, silo or pile reclaim system needs to be designed according to the flow properties of the stored material. Failing to choose a bin and feeder geometry that prevents the stored material from forming a stable bridge or pipe will often lead to chronic plugging.



**Above:** To achieve mass flow, the outlet dimensions must exceed the bridging dimension.  
**Below:** To achieve funnel flow, the outlet dimensions must exceed the piping dimension.



A key factor to understand is how the material will flow within the bin, as this determines the required geometry to a large extent. There are two main flow patterns in bins: Mass flow and Funnel flow. Mass flow is a 'first in, first out' pattern, as the material discharges as a single body, with all particles in motion at once. Material slides along all of the wall surface at all times. Funnel flow is a 'first in, last out' flow pattern, in which material is stagnant along the bin walls and funnels down from the top, shearing within itself.

Whether we observe mass flow or funnel flow is down to the angle of the sloping bin walls. For each material and bin shape there is a minimum angle to achieve mass flow. If the walls are at or above this critical angle, mass flow will occur. If the angle is shallower, there will be funnel flow.

To design for mass flow, the bin must have walls at an angle greater than the angle needed for mass flow, a discharge outlet that is larger than the material bridging dimension, and material must discharge evenly from the entire bin outlet. Otherwise, there will be bridging and a high likelihood of plugging. To design for funnel flow, the walls must be shallower than the angle needed for mass flow and the discharge outlet must be larger than the piping



dimension. If not, the bin will experience piping (also known as rat-holing) and resulting plugging.

Crucially, the piping dimension is usually larger than the bridging dimension for any given material. For difficult-flowing materials, the difference is larger, with piping dimensions two, five or even 10 times greater than bridging dimensions. Often - but by no means always - this leads to the selection of mass flow for difficult-flowing materials.

In the 1950 and 1960s, Dr Andrew Jenike at the University of Utah laid the foundation for translating a material's flow properties into a bin and feeder design that delivers reliable flow without hang-ups. For example, Dr Jenike showed that the degree of strength a material gains under load will tell you the minimum hopper discharge opening required to avoid material bridging or piping above the feeder.

While Jenike's theories have proven to be extremely useful, they are often not well understood or well applied by industry. Instead it seems that industry prefers to rely on rules-of-thumb for selecting bin and feeder geometry. While these can work well for easy-flowing materials, they often fail to produce reliable results when applied to a bin and feeder intended to handle a difficult-flowing material.

Kamengo's research in the 1980s sought to extend upon Jenike's theories to the design of bins and feeders for cohesive and low-bulk-density fibrous materials, such as limestone, rock gypsum and alternative fuels. Kamengo built an adjustable full-size test bin whose discharge opening, sloping wall angles and liners could be changed. The team systematically tested the theoretical geometries that would deliver reliable flow for a multitude of difficult-flowing materials according to Jenike's theories.

The team proved that these theories, when applied correctly, could be used to design a reliable bin that self-empties with only the aid of gravity, even in the case where material flow was extremely difficult.

## 2. Stored material compaction

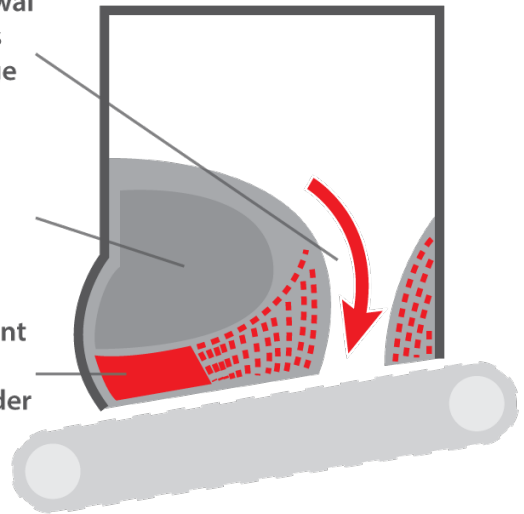
Having developed a method for designing reliable bins for difficult flowing materials, Kamengo proceeded to phase two of its research, which was to add a feeder to its test bin. In this case, the team added a screw feeder to meter the stored material.

What happened next surprised the research team. As soon as the feeder was added, the bin, which the team knew would self-empty under gravity, started to plug. This was because the material flow pattern inside the bin is altered by the action of the feeder. The Kamengo team found that the conveying action of conventional feeders, such as screw and belt feeders, can be felt far above the discharge opening of the bin. This conveying action compacts the stored material against the bin wall. The act of compacting

**Selective withdrawal results in rat holes and poor discharge**

**Stagnant material at front gains in strength**

**Compaction at front wall results in bridging over feeder**



the material strengthens the stored material. When the structural strength of the stored material is high enough to support its weight across the opening of the bin, bridging results. The conventional feeder has reduced the *effective* discharge outlet of the bin.

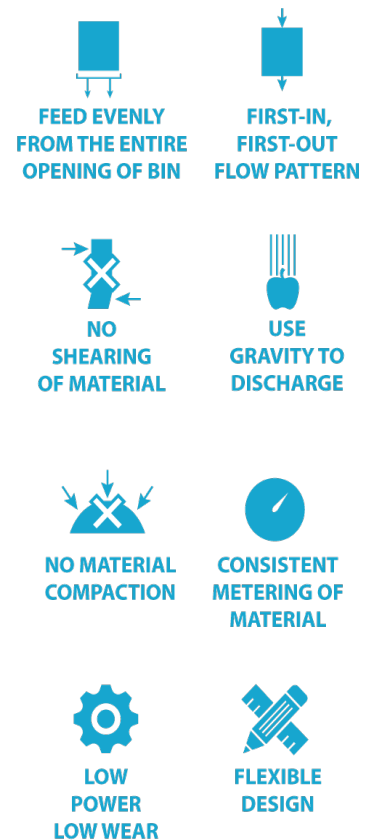
## 3. Uneven material discharge

Typical conventional feeders such as screw and belt feeders withdraw material primarily from the rear of the bin, leaving behind a stagnant pocket of stored material at the front of the bin. This stagnant pocket compacts under its own weight. The uneven withdraw of material by the feeder can induce an unintended change in material flow pattern. Furthermore, this stagnant pocket compacts, building the required strength needed to form a stable bridge over the feeder, causing the bin to plug.

## Principles applied

Kamengo's approach is to first identify the stored material's flow properties using testing equipment specifically designed to characterise the materials. The next step is to translate the material flow properties into a bin geometry that will deny the stored material the opportunity to bridge or pipe over the feeder. Specifically, Kamengo will choose a hopper discharge width

Feeders often alter the flow of materials, compacting them and undermining bin geometry.

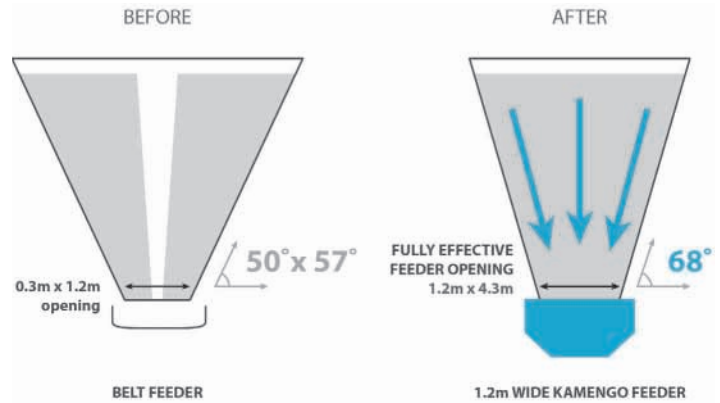


The principles and main advantages of the Kamengo Feeder.



**Left:** The poor geometry of a pyramid hopper for rock gypsum meant that the operator had to spoon feed material into it from front-end loaders, turning the hopper into a glorified chute.

**Right:** Before and after configurations for feeding rock gypsum at the cement plant.



and length whose spans exceeds what the stored material can bridge over. Furthermore, the correct bin angle and liner will ensure the stored material will self-empty in a mass flow pattern, avoiding stagnant pockets of material inside the bin. Stored material that is permitted to linger will gain in strength and ultimately lead to plugging.

To solve plugging problems, Kamengo designed its own feeding system, the Kamengo Feeder. It resolves many of the shortcomings of conventional feeders. The feeder withdraws material evenly from the entire bin discharge opening and does not compact any stored material.

### Case study

A cement plant was using front end-loaders to unload barges of rock gypsum into a pyramid hopper that was discharged via a 30cm x 120cm opening straight onto a conveyor belt that led to either the cement kiln or a storage silo. The discharge opening had a hydraulic flap to meter material onto the conveyor belt.

Unfortunately, the hopper never worked. If the plant put any head of material into the bin, it would plug immediately. To compensate, the front-end loaders would drip-feed material into the hopper, reducing the pyramid hopper to a chute. The existing pyramid hopper was suffering from chronic plugging for three reasons.


1. The sloping walls and discharge opening of the existing hopper above the belt conveyor were insufficient to produce reliable mass flow. Firstly, at just 50° and 57° respectively, the sloping walls were too shallow. For a pyramid hopper to achieve mass flow with this material the angle would need to be 75°. This encouraged funnel flow behaviour.
2. The conveying action of the belt conveyor was compacting the gypsum against the front of the hopper wall, giving it significant shear strength. With enough compaction, the material would gain sufficient shear strength to bridge over the hopper discharge opening.

3. The belt conveyor mainly withdraw material from the rear of the hopper. This, in addition to the shallow sloping walls, induced a funnel flow discharge pattern. Unfortunately, the piping dimension for rock gypsum in a pyramid hopper is 75cm by 600cm. This is much larger than the existing outlet, indeed larger than the top of the hopper!

The solution to fix this front-loaded metering bin was to replace the storage hopper with one with plane flow shape, steeper hopper walls and a wide and long opening. Unlike a pyramid hopper, which converges into two planes, a plane flow hopper only converges in one plane at a time. A plane flow bin shape is the most conservative bin shape and is often necessary when designing for a difficult flowing material. The wall angle needed to ensure mass flow discharge for the rock gypsum in a plane flow hopper is just 53°, as determined via material flow testing. The angle of the walls in the new hopper was 68°. Finally, a wide and long discharge opening is required to ensure the stored materials cannot bridge over the feeder. For this configuration the necessary outlet was just 1.2m x 4.3m. By correcting the geometry of the storage bin, if one were to remove the feeder, the hopper would now self-empty with gravity in a mass flow pattern.

The second half of the solution was to ensure the entire hopper and feeder arrangement will discharge via mass flow. To do so, Kamengo paired the new hopper with a correspondingly long and wide Kamengo Feeder. The value of this is that it withdraws material evenly from the entire discharge opening of the hopper, resulting in true mass flow.

### Concluding remarks

Good bin design means making sure that gravity can always provide enough force to overcome the internal forces of the material. Carefully consider the desired flow pattern, bin geometry, discharge opening, the angles of the sloping walls, liners and the effective discharge area. All must be correct to ensure plug-free operation. Get it right and gravity will win... ... and so will you! 



CLEANER, SAFER,  
MORE PRODUCTIVE  
CONVEYING

# WHAT A BLAST!

**SMART  
Series  
Nozzles**



**JET NOZZLE**



**RETRACTABLE NOZZLE 360°**

Martin Engineering's SMART™ Series nozzles are designed to deliver the optimum force and blast pattern to dislodge troublesome accumulated material. Installed to clinker coolers, pre-heaters, and other high-temperature locations, the innovative Y-shaped design of SMART Series nozzle assembly provides easy and safe access to air cannon units, as well as our variety of interchangeable nozzles, without costly operation shut down.

Inspections, maintenance, even replacement can be done from outside the vessel – no need to remove the cannon. This minimizes potential refractory damage and reduces service time and risk of injury.

SMART Series nozzles. Brilliant.



Scan this code or visit  
[info.martin-eng.com/worldwide](http://info.martin-eng.com/worldwide)  
to contact your local  
Martin business unit

 **martin**  
engineering





Schaeffler Lifetime Solutions

# MONITORING: THE RIGHT SOLUTION



One of two Schaeffler ProLink systems installed on a vertical roller mill at Baştaş Çimento in Türkiye.

Türkiye-based Baştaş Çimento, part of the Vicat Group, was looking for a monitoring solution for its vertical roller mills (VRMs) and other machines, including dosing units, pumps and fans, with the objective of increasing the reliability of failure detection and thus equipment availability. The goal was to improve the planning of maintenance work in order to prevent unplanned shutdowns.

## The challenge

As elsewhere in the cement sector, the machines at the Baştaş Çimento plant work around the clock under extremely demanding conditions. VRMs are particularly critical, with large and dynamic loads that act on bearings and units such as motors, pumps and fans. In addition, this large machinery is exposed to many environmental influences like dust, dirt and moisture.

Up to now, the VRMs at the plant had been measured using hand-held measuring devices, with vibrations in critical machines and housings measured by fixed-wire sensors. However, this was not sufficient to detect faults in advance.

Mechanical Maintenance Manager Güneş Özel sums up the challenge. "My biggest concern was an unplanned shutdown, which is why we monitored our vertical mill and other machines in our plant



One of more than 100 OPTIME CM sensors that operate at Baştaş Çimento.





"Both online monitoring systems from Schaeffler effectively meet the requirements for optimising plant performance and maintenance management. The ability to obtain a wide range of services from a single source increases operational efficiency and provides companies with strong overall technical support. OPTIME CM and ProLink CMS help us to detect faults at a very early stage and to reduce unplanned downtimes."

Güneş Özel, Mechanical Maintenance Manager, Baştaş Çimento.



for many years, but this did not enable us to detect incipient damage early enough."

### The solution

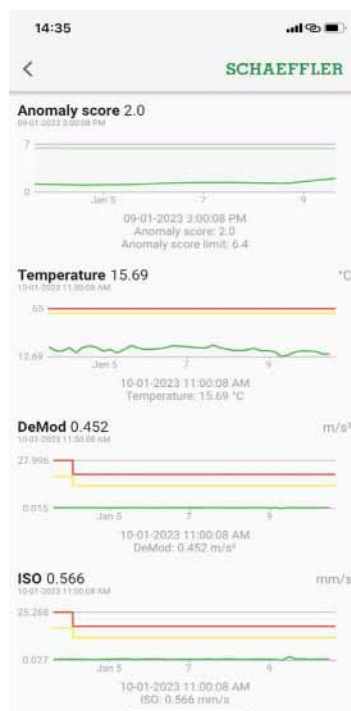
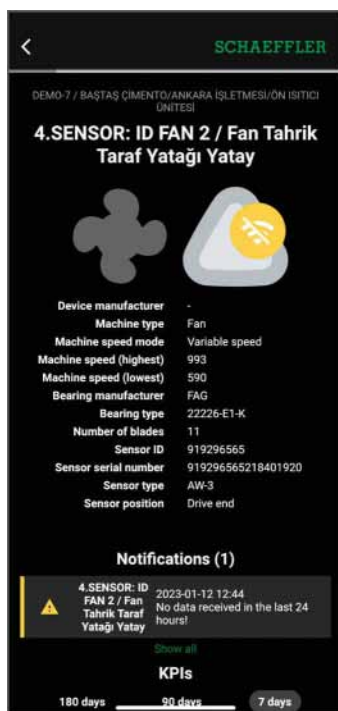
The plant therefore turned to Schaeffler, which offered a twin approach. For the VRMs, the Maintenance Department opted for the ProLink CMS vibration monitoring solution. In the ProLink CMS system, Schaeffler sensors record the vibrations on the VRM, while the ProLink condition monitoring system analyses the overall vibration condition as well as component-specific vibrations, e.g. in bearings and gears. All parameters and alarm statuses can be transmitted to the control room and the machine control system. The alarm condition can also be transmitted simultaneously to a maintenance planning system. The appropriate maintenance measures can then be initiated from there. High costs incurred by a stoppage can thus be reliably prevented. Two ProLink CMS systems, each with 10 vibration sen-

sors, have been monitoring the condition of the vertical mill since August 2023.

For the remaining equipment, the plant opted for the award-winning OPTIME (CM) digital condition monitoring solution. OPTIME CM detects problems, sends alarms accordingly and provides information on the possible cause of problems that arise. Expert knowledge of condition monitoring is not required as this knowledge is already integrated in OPTIME CM in the form of Schaeffler know-how. More than 100 sensors have been operational in the plant, with the first installed in May 2023.

### Quick response

Shortly after installation of the OPTIME CM sensors, an error message was displayed for a fan - as shown left. Maintenance confirmed that this was caused by bearing damage. The replacement of the bearing was then scheduled for the next planned shutdown. Installation was carried out by Turkish Schaeffler service provider Vibmer Mühendislik.



**About Schaeffler:** As a leading global supplier to the automotive and industrial sectors, the Schaeffler Group has been driving forward groundbreaking inventions and developments in the fields of motion and mobility for over 75 years.



Piotr Dowgalski, Biko-Serwis

# HRB BLENDING

Hydraulic road binders (HRBs) are chemical stabilisers made by blending substantial amounts of supplementary cementitious materials (SCM) - which may be granulated blast furnace slag, pozzolans, fly ash, burned shale or limestone - with clinker. The use of HRBs is more cost-effective and has CO<sub>2</sub> emissions 5-25% lower than conventional road base mixtures.



Biko-Serwis was asked to design and build an HRB blending plant by Carmeuse for a site in Belgium. The installation's main product was to be HRBs produced according to EN 13282-1 and EN 13282-2 standards, as well as composite cements according to EN 197-1 and limes according to EN 459-1. Depending on the selected recipe, the finished product may consist of: lime, cement, slag, fly ash and gypsum, as well as other additives. The assumptions and requirements specified were:

- 4 steel silos, each with capacity = 250m<sup>3</sup>, Ø = 4150mm;
- 1 buffer silo, capacity = 100m<sup>3</sup>, Ø = 3100 mm;
- Automatic dosing, weighing, mixing, conveying and loading;
- Operating temperature of -15°C to 40°C;
- Air humidity up to 75%;
- 5 stations to unload raw materials from silo trucks;
- 2 loading stations with 2-axis positioners;
- 2 automatic sampling stations for products;
- Maximum installation height up to 45m.

## Unloading

Semi-finished products are supplied by silo trucks. The driver parks the silo trailer in the correct loading zone, then scans the QR code or manually enters the product number. This determines which silos will be filled. The driver connects the silo tanker with a flexible hose to the unloading pipeline that leads to the correct silo. The driver confirms that unloading can commence by pressing the appropriate button on a local control panel.

Depending on the type/size of the compressor installed on the vehicle, the unloading time may vary, but should not exceed 40 minutes. The installation has been designed in such a way that, at the end of unloading, it can take over the entire amount of air stored in the tanker under a pressure of 2 bar. Thanks to this, it is possible to almost completely eliminate the risk of dust emissions.

## Accuracy is key

The heart of the blending facility is the accurate weighing and dosing of appropriate portions of semi-finished products from buffer silos. The system works in batches, not continuously, which improves accuracy. There is no need to buffer the finished product in additional buffer tanks, as the risk of overfilling the tanker is very small.

The dosing systems under each silo are based on two drum gate valves. The first is a cut-off valve. The second is a regulating flow valve equipped with a pneumatic digital positioner. The semi-finished products are dosed from individual silos through aeration slides to weighed tanks with a capacity of 3m<sup>3</sup> each.





# Construction becomes Reality

with DI MATTEO Group

With over 50 years of experience, DI MATTEO has set many standards in the business of conveying alternative and other bulk materials.

Products like the innovative Bucket elevators as well as various state-of-the-art Screw-, Belt-, Pipe-, Apron- and Drag chain conveyors are worldwide in operation.





Loading can be performed by two 2-axis positioners. It is possible to unload and load different vehicles at the same time.



The weighed doses are transferred from the weighing buffers directly into a 3.65m<sup>3</sup> batch mixer. They must be loaded in the correct order, as this has a significant impact on the quality of the mixture. The mixing process takes about 60 seconds, after which the finished product goes to a continuous mixer below, with a buffer capacity of 4m<sup>3</sup>. The continuous mixer, thanks to its reversible screw conveyor, transports the product to one of the two loading stations.

### Loading

The two loading points are fitted with a 2-axis positioner. They have loading spouts with a central cartridge dust collector. The operating range of the positioner is  $\pm 500\text{mm}$  for the x-axis and  $\pm 150\text{mm}$  for the y-axis. This allows the loading chute to be positioned centrally in relation to the axis of the silo trailer hatch, which has a positive effect on the durability of the spout components. It makes positioning of the truck within the loading bay less crucial.

The system checks the amount of raw materials in the buffer silos, then determines the number of portions to be prepared according to the blend requested, to an accuracy of 2kg per ingredient. Depending on the volume of silo trailer and the quantity composition of a given mixture, it can be from a few batches to more than a dozen. A 36m<sup>3</sup> silo truck can be loaded at 150m<sup>3</sup>/hr, providing a loading time of less than 15 minutes.

After the road tanker is loaded, the driver lifts the loading spout, which the system interprets as the end of the loading process. Then it is possible to leave the loading zone and drive in the next silo trailer. It's also possible to immediately start loading mixture at a second loading zone.

At every stage of the loading and unloading process, Biko-Serwis places great emphasis on ecology and zero-emissions policy. It uses recycled materials and has modernised its equipment to deliver sustainable performance for its clients.

The entire loading process is carried out without dust emissions, thanks to the use of a high-performance 3000m<sup>3</sup>/hr bag dust collector, which collects dust from weighed tanks as well as from batch and continuous mixers.

### Simultaneous loading and unloading

The blending plant has three operational zones for silo trailers: one for unloading and two for loading. This enables simultaneous unloading of semi-finished products of a silo trailer into buffer tanks while loading another silo trailer with the finished product. However, it is not possible to load two silo trailers at the same time. This is due to the complexity of the production process of the finished mixture.





**Relax,  
it's Venti.**



## **We extend the kiln cycle.**

With swiveling and mobile, noise-minimised cooling fans, Venti Oelde specifically reaches the critical areas of the kiln shell. Thanks to continuous measuring of the shell temperatures and precise cooling, Venti extends kiln cycle time and lowers your operating costs.

**Precise cooling**

**Reduced operating cost**

**Low-noise operation**

**The number 1  
in the  
cement industry**



We make air work for you | [www.venti-oelde.com](http://www.venti-oelde.com)





Paul Brown, *Global Cement Magazine*

## REPORT: PFEIFFER PANEL FLORIDA 2023

120 participants from the North & South American cement and gypsum industries converged on Fort Lauderdale, Florida, USA 12-14 December for Pfeiffer Panel Florida 2023. The event, hosted by Gebr. Pfeiffer, was additionally sponsored by FCT Combustion, IBAU Hamburg/Haver & Boecker and Redecam. *Global Cement* was in attendance.

The latest Gebr. Pfeiffer Panel took place at the Conrad Hotel in Fort Lauderdale, Florida, and comprised 12 presentations, including five guest papers, over two full days. A fully-focused audience, with a significant South America contingent, was attentive throughout. Here we focus on cement applications. (Gypsum-related papers appeared in the February 2024 issue of *Global Gypsum Magazine*).

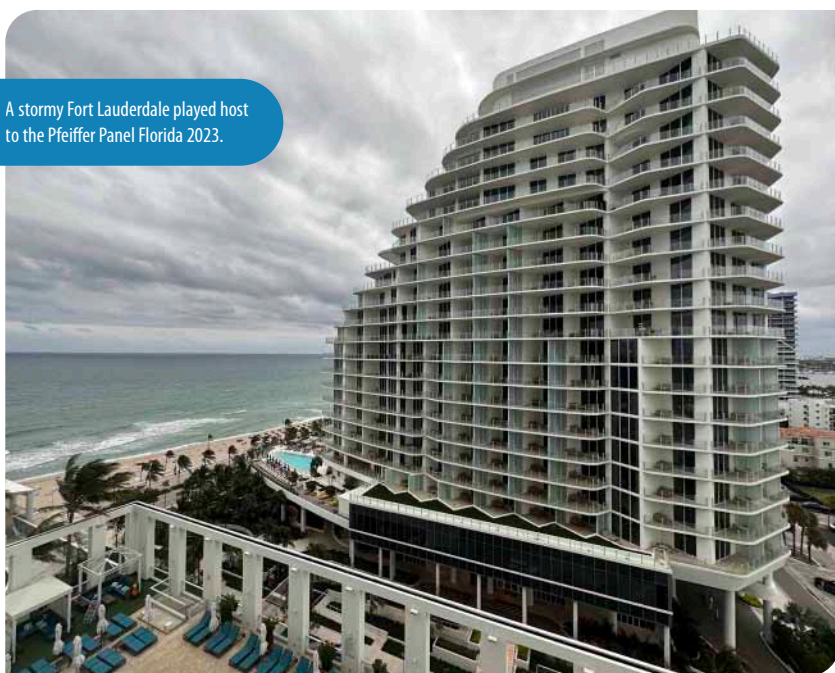
After a welcome reception the preceding evening, **Tim Burden**, Managing Director of the Gebr. Pfeiffer USA, acted as Panel Host. Opening proceedings, Tim informed the audience that the event's key themes were 'Efficiency, Sustainability and Digitalisation', the three topics that Gebr. Pfeiffer is now focused on.

**Mathias Dülfer**, Chairman of the Executive Board, Gebr. Pfeiffer, gave the first presentation.



Mathias Dülfer, Chairman of the Executive Board, Gebr. Pfeiffer, gave the opening presentation.

A stormy Fort Lauderdale played host to the Pfeiffer Panel Florida 2023.



Mathias welcomed all participants. He said Gebr. Pfeiffer was a leader in vertical roller mill (VRM) development thanks to ~160 years of experience and more than 3000 mills supplied. Mathias said that durability, reliability and availability are the calling-card of Gebr. Pfeiffer's mills. Such advantages are vital for customers at a time when the cement industry is faced with a number of challenges. Pfeiffer is investing heavily in research that has already led to a technical edge, allowing VRMs that consume less energy than before, while offering maximum capacity, minimal footprint and reduced weight, all at lower cost. This can reduce energy requirements by up to 40% compared to other technologies.



# WE MOVE INDUSTRIES



HEKO offers the whole range of chains, rollers, sprockets and scrapers for reclaimers. HEKO products are proven in thousands of bucket elevators and conveyors, worldwide.

**Our components for the cement industry:**

central chains, link chains, reclaimer chains, sprockets, bucket elevators and clinker conveyors.

[WWW.HEKO.COM](http://WWW.HEKO.COM)

MORE  
THAN  
**100**  
YEARS



**HEKO**  
**GROUP**  
CONVEYOR SOLUTIONS



Left to right: Eagle Materials' Scott Turek, Gebr. Pfeiffer's Jannik Schmalenberger, Ozinga's Jeremy Reuscher.



Left to right: Gebr. Pfeiffer's Patrick Heyd (Executive Director, Sales & Project Engineering), Ana Exime (Area Sales Manager and Pfeiffer Panel event co-organiser), and Tlm Burden (Managing Director, Gebr. Pfeiffer USA).

**Patrick Heyd**, Executive Director, Sales & Project Engineering, then stepped up to present aspects of Pfeiffer's MVR mills. Patrick began by describing the company's illustrious history in the development of vertical roller mills. He provided a comparison between two mills, one produced in 1977 and one from 2023. The increase in power density was a factor of 3.2 over 46 years. Heyd pointed out several advantages of Pfeiffer mills, including smooth operation of its rocker arm design, which leads to a parallel grinding gap, as well as flat table liners and symmetrical roller tyres. This all helps to reduce vibration, a major goal for Gebr. Pfeiffer.

**Jannik Schmalenberger**, Sales Manager, then introduced Gebr. Pfeiffer's modular ready2grind mills. The ingenious design allows the ready2grind plant to be

pre-assembled, transported in standard containers and mounted swiftly and efficiently with manageable costs, making it the ideal concept to respond to changing local cement market requirements. Product quality and fineness can be set within broad limits of up to 6000cm<sup>2</sup>/g Blaine. Three different models offer annual production rates of up to 0.25Mt/yr, 0.58Mt/yr and 0.66Mt/yr.

**Dr Caroline Woywadt**, Director Process Technology, Gebr. Pfeiffer, pointed out that SCMs represent the best way to reduce CO<sub>2</sub> emissions from cement. When it comes to grinding, SCM properties such as reactivity, feed moisture and granulometry are very important. Depending on the material the machinery experiences different tensile pressure, compression, impacts from heating and



Delegates from UCEM, Ecuador.



Redecam's Jonathan Forinton spoke about filter maintenance.





## ***MOVING YOUR WORLD*** by covering all your needs.

We are your partner that provides the full range of lubricants and solutions for all cement plant applications – right around the globe. This includes a wide range of services to ensure the performance, efficiency, and process reliability of your equipment. You can focus on what you do best – manufacturing cement.

[www.fuchs.com/cement](http://www.fuchs.com/cement)







Haver & Boecker's Markus Horstkoetter demonstrates the benefits of the NordiVent bag.



Walan Specialty Materials' Jason Murtha and Lisa Bhadsavle.

attrition. Caroline described a number of tests that can be used to compare grindability of SCMs. Pfeiffer conducts tests on prospective clients' SCMs to assess mill requirements and verifies these against its knowledge from existing references.

**Jeremy Reuscher**, Senior Development Engineer, Ozinga, was the first guest speaker. He provided an excellent summary of the principles behind different types of grinding equipment from a concrete sector participant's perspective, outlining what it looks for when it discusses options with mill suppliers such as Gebr. Pfeiffer.

**Jonathan Forinton**, Regional Sales Manager, Redecam, and another guest speaker, focused on preventative maintenance for bag filters, an area that has great potential in many plants, especially given the falling level of staff expertise. He argued that cement plant operators should not be shy in contacting experts such as Redecam, as it can help with training and offers CFD analysis to investigate pressure

distribution, dust-flows, temperature and more. Jonathan showed an example where the client changed bags every year due to ruptures. The cost for both downtime and the bags themselves were very high. A good maintenance strategy will only work if the people executing it have the right knowledge. If bags are installed incorrectly they can be damaged easily. Redecam can teach operators to do it professionally, with benefits for the rest of the filter's lifespan.

A third guest speaker, **Markus Horstkoetter**, Area Sales Manager, Haver & Boecker, said that his company is the leader in the European cement packing sector. Its <6000bag/hr Roto-Packer® RVT is described as 'maintenance- and operator-friendly, has a clean process, is of modular design, has highest availability and is intelligent.' Recent orders in 2022/23 include, for example, 19 units to cement sector clients in Mexico alone, where legislation has moved from 50kg to 25kg bags. The company's new Roto-Lock® dosing unit is described as maintenance-free, has a fully-closed filling channel, fills cleanly, needs no adjustments or readjustments, while a long operational lifetime is achieved thanks to improved material selection and optimised design. Markus also outlined the construction of a complete and pre-configured packing line for a Gebr. Pfeiffer ready2grind installation in just six months. Markus additionally showed a polyethylene bag. The clean, weatherproof, stackable bag was reportedly dropped from a height of 7m without damage. Compared to paper bags the PE bag empties 100% of its contents, so the ~5% of material that remains in the corners of paper bags is instead fully used.

**Lukas Schmitt**, Team Leader - Controls, Gebr. Pfeiffer, said that the company's GPLink digital product - developed to optimise MPS and MVR mills - gives users the option to store process data safely and independently of hardware over an extended




The FCT stand during a coffee break. Pedro Ladeira (far right) gave the presentation for the company.

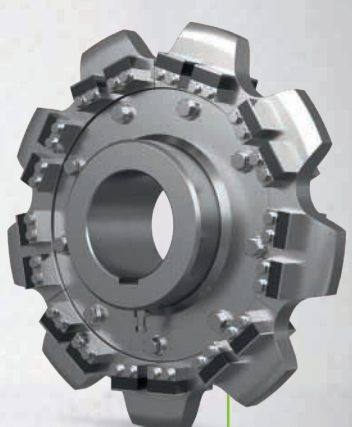


# “SUITED FOR HARSHEST CONDITIONS”

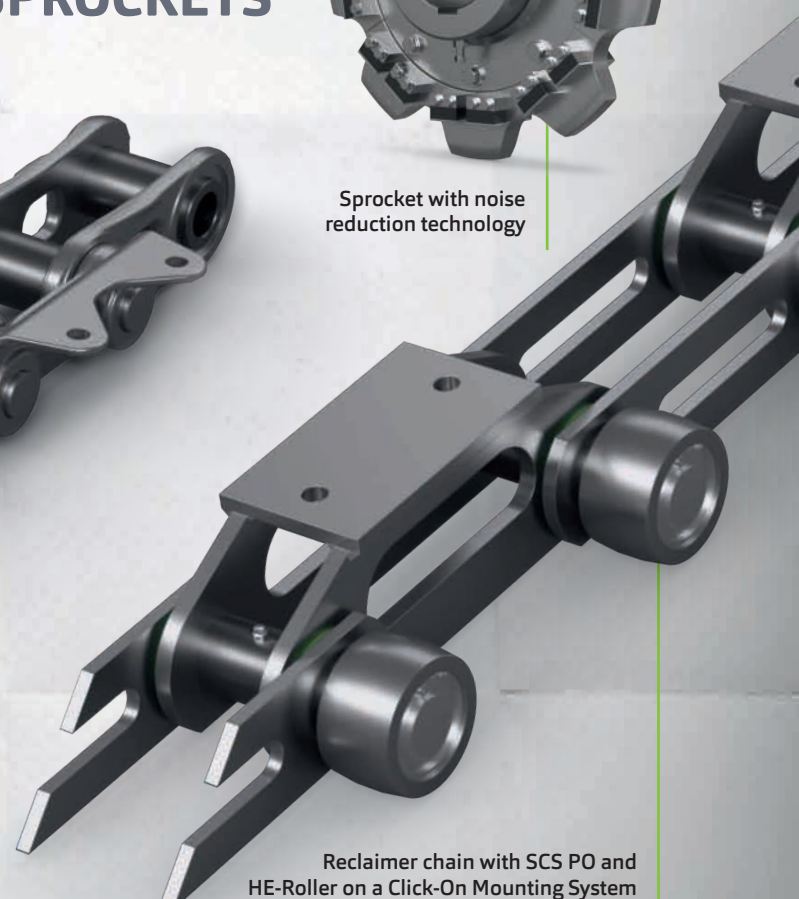
DISCOVER A HUGE PRODUCT RANGE  
OF A LEADING MANUFACTURER OF  
CONVEYOR CHAINS AND SPROCKETS  
– SINCE 1925.



Central bucket elevator chain  
with forged link plates



Sprocket with noise  
reduction technology



Reclaimer chain with SCS PO and  
HE-Roller on a Click-On Mounting System

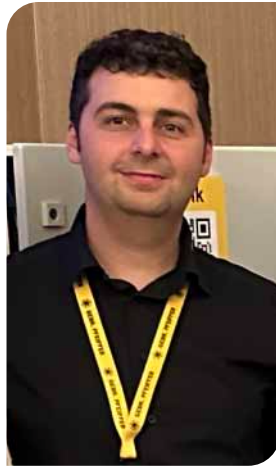


Cutting-edge chain technology  
Designed & manufactured by KettenWulf

[www.kettenwulf.com](http://www.kettenwulf.com)



Caroline Woywadt, Gebr. Pfeiffer, and Rudolf Broser, Rubros SAC.



Gebr. Pfeiffer's Lukas Schmitt.

period of time. Users can analyse and compare the data across machines and plants from anywhere in the world, even with mobile devices. Gebr. Pfeiffer experts can also be called upon to assist. Schmitt also discussed the innovative AuTeBa control technology developed for a Gebr. Pfeiffer client in Kazakhstan.

**Scott Turek**, Eagle Materials, described a case-study in which seasonal demand at its Sugar Creek plant meant additional capacity was needed at certain times of the year. A review of traditional technology options failed to find a commercially-viable solution. The project team concluded that the best option was a Gebr. Pfeiffer ready2grind mill with an MVR 2500 C4. The feed material was 90.8% clinker and 6.1% gypsum, with a feed bulk density of 1.3t/m<sup>3</sup>. At a production capacity of 55t/hr the power consumption was 17.9kWh/t, with an output fineness of 3650 Blaine. The team integrated the new VRM with the addition of two new finished cement storage silos and a synthetic gypsum material transport system to the new VRM and an

existing mill. A second cement mill project is currently underway.

**Peter Bales** described various improvements, modernisations and upgrades by Gebr. Pfeiffer's after-sales service team. Most enquiries concern capacity increases, often when kilns are upgraded and a raw mill becomes a bottleneck. Another goal can be reduction in energy consumption and a smaller CO<sub>2</sub> footprint, improving the mill's operational behaviour, reducing vibration level and higher product fineness. Common solutions involve classifier upgrades and nozzle ring alterations so that table speed can be increased. An example of an SLS classifier upgrade in Brazil gave the client higher separating efficiency, more capacity, central feeding and better fineness control, leading to a 22% rise in production and a 12% reduction in power consumption. Peter gave numerous other case-studies, including one of grit extraction in Ecuador on an MPS 5300 B raw mill. This increased the production rate by 37% while lowering MPS mill energy consumption by 0.2kWh/t. This will appear in detail in a future issue of *Global Cement Magazine*.

**Pedro Ladeira**, Sustainability Director at pyroprocessing and burner expert FCT Combustion, spoke on the hot topic of calcined clays, stating that it was the 'future of the industry.' For clays, FCT makes the FlashCalx pozzolan flash calciner and RotaCalx pozzolan rotary calciner, as well as burners, dryers, hot gas generators for solid, liquid and gaseous fuels and fluidised beds for SAF and coarse coal/petcoke. Grinding audits and optimisations are also offered. Regarding clay calcination, pozzolana activity is generally due to the amorphous or disordered structure of aluminosilicate obtained from the heat treatment of clays at 600-900°C. Kaolinitic clays are best for producing calcined pozzolans. It is an hydrated aluminium mineral with around 66% silica in its composition. The activated product generated is known as metakaolin. Again, a future article will go into the presentation in more depth.

**Dr Caroline Woywadt** introduced her second paper on the topic of calcined clay grinding. Building on her earlier point, she said that clays offer an opportunity to greatly reduce the 50% of CO<sub>2</sub> that is generated from the decomposition of limestone. Again, Gebr. Pfeiffer's mills offer the important advantage of drying, grinding and separating in one single machine. Caroline explained that CBMI is partnering with Gebr. Pfeiffer in calcined clay technology with the aim to offer a complete system for clay calcining.

After the presentations on the first day, guests were invited to a relaxing gala dinner evening at Mastro's Ocean Club - ideal for networking! Tim Burden summarised the successful two-day event and wished all participants a safe journey home.



Guests enjoying the event's Gala Dinner.





# PlastRetard®

The Multifunctional Additive

 **SICIT**  
sicitgroup.com



YOUR  
NATURAL  
FUTURE  
*Made in Italy*



## Canada: Canal Block integrates CarbiCrete process

Concrete block producer Canal Block has integrated CarbiCrete's cement-free concrete production technology at its Port Colborne plant in Ontario. CarbiCrete's technology produces concrete from steel slag. The integration at the Port Colborne plant includes US\$2.24m-worth of funding from the global innovation cluster NGen, towards a total project cost of US\$5.97m.

CarbiCrete CEO Chris Stern said "We are tremendously grateful for NGen's continued support, which is helping Canada position itself as the undisputed world leader in low carbon concrete."

Canal Block president Durk Bylsma said "Canal Block has had a long history of developing sustainable products for the masonry industry. We are

excited to partner with CarbiCrete to bring this truly revolutionary technology to market and further our commitment to be an ecologically and socially responsible manufacturer."



## Czech Republic: Ready-mix plant re-started

Cemex Czech Republic has successfully commissioned its Prague-Libuš ready-mix concrete batching plant in Prague, following an upgrade. The upgraded plant can now process five types of cements and admixtures, including Cemex's Vertua reduced-CO<sub>2</sub> concretes and recycled aggregates. Cemex Czech Republic has installed two recycled aggregates production plants at the site to process residual concrete.

## Germany/North America: INFORM partnerships

INFORM has announced new collaborations with two other software developers for the ready-mix concrete sector. US-based BCMI Corp and Canada-based Marcotte Systems will work with INFORM to develop AI tools for despatching ready-mix concrete.

INFORM senior VP Thomas Bergmans, who concluded the deals at World of Concrete, said "In addition to offering our proven AI-powered transport planning and execution software, we are very excited to see that these collaborations will further speed up the wide-spread use of our AI algorithms beyond our traditional markets." Bergmans said that the collaboration with BCMI Corp will provide ready-mix producers with 'enhanced decision-making tools, real-time logistics optimisation and intelligent automation, ultimately elevating operational performance and customer satisfaction.' Regarding the collaboration with Marcotte, he said "By combining Marcotte's robust experience in concrete production management with INFORM's AI capabilities, this ready-to-use solution will empower ready-mix producers."

## Germany/US: TopWerk endorses Partanna's CO<sub>2</sub>-negative binder

Concrete production equipment supplier TopWerk Group has formally endorsed Partanna Global's carbon-negative binder as a replacement for cement in the production of concrete using its equipment. Partanna plans to install TopWerk equipment at its four upcoming production plants, under an exclusive three-year agreement. The endorsement is intended to help shift TopWerk's global customers from using cement to using Partanna Global's binder.

Partanna Global CEO Rick Fox said "TopWerk's endorsement of Partanna represents a major vote of confidence in our technology from one of the most respected names in global construction. We're humbled and proud that one of the world's leading concrete machinery producers has given us their backing. We hope this signals to the industry that Portland cement is no longer the only solution in town, and that the days of burning rocks are fast coming to an end."

**global  
concrete**

**Interested in  
concrete?**



Join the *Global Concrete*  
group on LinkedIn.



## DUSTSCRAPE

### THE DUST FILTER CONCEPT FOR DUST REDUCTION AND PRESSURE REDUCTION AT TRANSFERS

The special filter medium of the DustScape retains dust particles that are generated due to material movement, and at the same time is permeable for the circulating air. The air escaping through the filter medium reduces the air pressure in the transfer, which is distorted by material movement. Used in combination with the AirScape, the DustScape unfolds its special properties and increases the efficiency of the ScrapeTec dust removal system. Dust and spills are thus completely avoided.

RETAINS  
DUST

WORKS WITHOUT  
ENERGY SUPPLY



ALL INFOS  
scrapetec.com

Phone +49 2842 9 32 92 94  
info@scrapetec.com

**ST** SCRAPETEC

ScrapeTec Trading GmbH  
Altfelder Straße 190  
47475 Kamp-Lintfort, Germany

## GLOBAL CONCRETE

### UK: Heidelberg Materials buys 100% of Smiths Concrete

Heidelberg Materials has acquired the outstanding Smiths Concrete shares from the Smiths family. Smiths Concrete operates seven concrete plants, two quarries and an inert landfill site across Warwickshire and Oxfordshire in the centre of England. It has owned a minority stake in the Banbury-headquartered Joint Venture since its inception in 1957.

Going forward, Smiths Concrete will continue to operate as a stand-alone entity and there are no plans currently to change its branding or day-to-day operations. Similarly, it will continue to seek approval for its proposed new sand and gravel quarry at Wasperton Farm in Warwickshire, England.



### Sweden: Heidelberg Materials deploys electric concrete truck (above)

Heidelberg Materials Northern Europe has announced its deployment of a 100% electric concrete mixer truck from Volvo.

Heidelberg Materials Northern Europe head of environmental, social and governance (ESG) & public affairs and vice president for Sweden Karin Comstedt Webb said "This partnership is a beacon for industry-

wide decarbonisation, bringing us closer to our climate goals in Northern Europe. With a full-load capacity of ready-mixed concrete, our environmentally friendly truck not only heralds a new era in construction transport efficiency, but also confirms our leading position in the European building materials sector."



Interview by Peter Edwards, Global Cement Magazine

# ENZYMATIC: SELF-HEALING, LOW-CO<sub>2</sub> CONCRETE

In our fifth article about the companies short-listed within the Global Cement & Concrete Association's Innovandi Open Challenge, *Global Cement* speaks to Charles Maddox, CEO of self-healing concrete developer Enzymatic...

**Global Cement (GC):** Please could you introduce Enzymatic to our readers?

**Charles Maddox (CM):** Enzymatic was founded in early 2023 to develop a form of self-healing concrete that had been developed by Prof Nima Rahbar and Prof Suzanne Scarlata at the Worcester Polytechnic Institute (WPI), a top engineering university in the north east of the US. Having worked in the US Air Force, I was extremely interested to work in this area, as damage to concrete runways costs the USAF dearly in lost time for repairs. There is also the very real risk of concrete being drawn into the engines, which is very dangerous and also a multi-million dollar repair bill.

Today Enzymatic is growing rapidly. It operates a laboratory in Worcester, Massachusetts, and employs PhD graduates, experienced entrepreneurs and advisors. Over the past 12 months we have developed our technology to make it commercially feasible, thanks in large part to our Chief Technology Officer Dr Isaac Nardi.

**GC:** How does the technology work?

**CM:** Our technology relies on carbonic anhydrase. In nature, this enzyme converts carbon dioxide to bicarbonate in cells so that it can dissolve in the blood. It also converts it back to carbon dioxide when it reaches the lungs. It is the most efficient enzyme found in nature, speeding up the reaction by a factor of 10 million.

In Enzymatic's solutions, we harness this enzyme's ability to combine unbound calcium ions in the concrete mix with atmospheric carbon dioxide, which converts it into calcium carbonate during setting. This helps to plug voids in the concrete, which leads to a range of benefits.

Initially we used naturally-derived carbonic anhydrase from cows, which cost about US\$1000 for 250mg from commercial suppliers! However, we have since evolved a proprietary strain of carbonic anhydrase that can be synthesised at a cost of single digit dollars per 250mg. Crucially, it is stable at temperatures of up to 60°C for up to 45 days, with no reduction in activity. This is ideal for applications in which the concrete reaches high internal temperatures as it cures. We are developing this



Sample structure made using ECM.





Charles Maddox is the CEO and one of the co-founders of Enzymatic, based in Las Vegas, Nevada, and Worcester, Massachusetts. An ex-US Air Force pilot with an MBA from the Worcester Polytechnic Institute, Charles has launched and sold several start-ups since leaving the airforce and is also a partner in a construction company.



commercially as one of our two solutions - the Enzymatic Corrosion Inhibitor (ECI), for conventional concrete blends.

**GC: What dosage of ECI is required?**

**CM:** The dose of ECI needed is very small, with a typical loading of 130-260mg/m<sup>3</sup>, but it has a big effect. It's just a drop of water in each m<sup>3</sup>, unlike some other porosity reducers which might need hundreds of grams. We need so little, because the enzyme is not consumed in the reaction. One enzyme molecule, just 4-5nm wide, can convert 10,000 calcium ions into calcium carbonate using ambient CO<sub>2</sub> by the time the matrix is immobilised. Multiply that by the 10 trillion molecules in a typical dose and you have an extremely potent solution.

To illustrate, we took MRI scans of a control concrete sample with no ECI and an identical concrete sample containing ECI. In the control, there were 55,000 pores, many of them closely bunched together. In the sample containing ECI, the number of pores was just 143 - a huge difference. The pore volume fell massively and there were no connected pores, unlike in the control. There are far fewer opportunities for the sample to develop cracks and no pathway for corrosive ions to penetrate the matrix. This considerably reduces the chance of damage to the concrete and any supporting steel. Additionally, this opens up some fantastic possibilities. We no longer need to worry about the 'dangers' of smooth marine sand and can be more accommodating when it comes to aggregate selection too.

**GC: How long does the enzyme survive?**

**CM:** It survives for about 12 months, whether in solution or in concrete. However, in concrete it is immobile and cannot access the free calcium ions or ambient CO<sub>2</sub>. However, it remains active for the full 12 months, perhaps even longer. Indeed,

we took a seven month old concrete sample, cut a notch into it, and sprayed a calcium silicate solution on the exposed surface. The material re-grew extra calcium carbonate in the notch, all with no CO<sub>2</sub> emissions.

**GC: What are the CO<sub>2</sub> benefits of ECI?**

**CM:** The selling point of ECI is not the reduction of CO<sub>2</sub> emissions *per se*, but there is a marginal reduction. However, ECI is just one of the two ways that we can harness the power of enzymes in the building materials sector.

Our Enzymatic Construction Material (ECM) is a supplementary product to regular cement. We envisage capturing CO<sub>2</sub> from cement plants and using it as a feedstock for ECM.



A batch of Enzymatic's patented carbonic anhydrase.



A 1mm x 3mm notch in a sample of concrete containing ECI was able to 'heal' following the application of a calcium silicate solution.



To make ECM, we use a two-step process that starts with a bulk phase of mostly sand and then incorporates a secondary liquid phase. This secondary phase uses the enzyme and calcium solution to absorb CO<sub>2</sub> and form calcium carbonate that becomes part of the final structure and binds the sand together. The curing phase lasts just two hours, making this a powerful process to make pre-cast elements. This would provide another stream of revenue for the cement plant operators, as well as a way to remove up to 90% of the CO<sub>2</sub> emissions from a cement plant stack.

We have now reached compressive strengths of 30MPa with ECM, strong enough for low-rise construction, blocks, pavements, roof tiles and many other applications. We can't consider high-rises or bridges at this stage, although we are working on it.

ECM structures can be repaired by adding calcium and enzyme solutions, even for cracks of up to 3-4mm. The benefit is that the repaired area is just as strong as the rest of the material, reducing the risk of the crack reforming.

**GC: What are the CO<sub>2</sub> credentials of ECM?**

**CM:** By removing the CO<sub>2</sub> from the cement plant stack and using it as a construction material, ECM can entirely eliminate the CO<sub>2</sub> associated with the

heating and decarbonisation of limestone and additionally sequester an additional 66kg/m<sup>3</sup> of CO<sub>2</sub>.

**GC: What scale have you reached and what's next?**

**CM:** At its core, Enzymatic is an enzyme development company. Right now, we are proving that the concepts behind ECI and ECM work. Once this has been achieved, this will demonstrate to participants in the sector how they can use our enzymes to their advantage. We are already well into our scale up plans to produce enough ECI for 30Mm<sup>3</sup>/yr of concrete. This will be the easier technology to implement at first, as it is - literally - a 'drop-in' solution. The next step for ECM is to build a pilot plant that can generate 1t in batches.

We are keen to develop links to industry, and so are appreciative to have been short-listed by the Global Cement & Concrete Association in its ongoing second Innovandi Open Challenge, which seeks to identify novel, low-CO<sub>2</sub> additives for cement and concrete. We are now in ongoing discussions with six GCCA members to form a consortium focusing on ECI.

**GC: What are the biggest barriers to roll out?**

**CM:** The biggest issue is regulatory hurdles. We are currently sending out ECI samples to our consortium partners to make sure that it can meet regulations in different markets. Then we need to start getting approval for their use. However, this can be a long drawn-out process. We hope to leverage their expertise and work with GCCA to help us roll this out globally.

**GC: How much impact do you think ECM and ECI will have by 2030?**

**CM:** If implemented worldwide, ECM will reduce emissions by 3.7Bnt/yr, over 18% of all emissions reduction targets. I know this is a 'bit' on the high side, but we have to aim high to be in with a shot of meeting our collective CO<sub>2</sub> targets.

**GC: Thank you for your time today Charles. We look forward to Enzymatic's next steps.**

**CM:** You are very welcome Peter!



Intense work in the laboratory has enabled Enzymatic to achieve compressive strengths of 30MPa for concrete that contains ECI.





18-19 SEPTEMBER 2024

DUBLIN, IRELAND

17th  
**global**  
**cemfuels™**

**CONFERENCE • EXHIBITION • AWARDS**

Alternative fuels for cement and lime

Global, regional and national market trends

Technological developments and case studies

**cemfuels.com**

#cemfuels

Global CemFuels Enquiries

Exhibition and sponsorship:

paul.brown@propubs.com

Programme and speakers:

robert.mccaffrey@propubs.com

# CEMFUELS

Including  
Alt Fuels Short  
Course

Confirmed  
cement plant  
field trip

Organised by:

**global**  
**cement**  
MAGAZINE

Including  
CemFuels  
Awards  
Gala Dinner




[Contents](#)
[Subscribe](#)
[Ad Index](#)

## Türkiye: Sinoma to oversee solar projects for Limak

Sinoma Overseas Development has won a contract to execute the first phase of a four-plant solar power project across three of Limak Group's cement plants in Türkiye. The contract covers engineering, procurement and construction (EPC) of an initial 28.2MW-worth of new solar power capacity.

Sinoma Overseas Development said "This project opens a new chapter of our robust partnership built on many successful practices of cooperation

on projects of cement EPC and supply services over the past decade, leading us into a new field of green energy. The deeper and wider cooperation between Limak and us reflects its recognition and trust in our company's ability to perform the contracts in the past, indicating another significant leap in exploiting the Turkish market, expanding localised operations, and transforming to providing green energy projects, and a greener, more sustainable future."

## Brazil: Solar power for Votorantim

Votorantim Cimentos and Atlas Renewable Energy have launched a joint venture to build a 470MW solar power plant in Paracatu, Minas Gerais. Additionally, the parties signed a power purchase agreement (PPA) for the supply of 100GWh/yr of solar energy for Votorantim Cimentos' cement plants between 2026 and 2041. The moves align with the producer's aim to achieve 75% renewable energy reliance in its operations.



## UK: CTP Team to build bag filter at Caudon

Aggregate Industries has successfully removed gas duct sections from the electrostatic precipitation filter at its Caudon cement plant in Staffordshire (right). This will make way for the installation of a new CTP Team process kiln bag filter, following an annual shutdown.

Caudon plant capital expenditure manager Mark Powling said "The new bag filter not only provides the best available technology, but will enable the Caudon plant to optimise its plant performance, driving its decarbonisation and alternative fuel strategies. Thanks to the project team for their efforts and hard work to date."

## Saudi Arabia: Sinoma working at Al Kharj

Sinoma Overseas Development has reported the successful construction of the first steel column for the kiln inlet of the new Line 3 at Yamama Cement's Al Kharj cement plant in Northern Halal. The China-based supplier used a crawler crane to position the structural element, which is painted in its characteristic blue. In a post to LinkedIn, it said that the development 'kicks off the steel construction and installation' of the upcoming 12,500t/day line.



## Austria/Australia: MCi Carbon to capture CO<sub>2</sub> for RHI Magnesita

RHI Magnesita has signed a deal with Australia-based carbon capture company MCi Carbon for the construction of a large-scale carbon capture plant at its Hochfilzen dolomite plant in Tyrol, Austria. Prior to construction of the large-scale system in Austria, the companies will partner to test and scale-up MCi Carbon's technology at the latter's Myrtle demonstration plant in New South Wales, Australia. The Myrtle demonstration plant will aim to capture 1000t/yr of CO<sub>2</sub>.

## Egypt: Redecam to upgrade Ain Sokhna

Arabian Cement Company is replacing electrostatic precipitators at its Ain Sokhna cement plant with bag filters. The project will commence in two phases. Arabian Cement Company will first install the filters in Line 1 of the plant, before subsequently installing them in Line 2. Italy-based air pollution control specialist Redecam Group will execute the upgrades.



# Fast. Fair. Flexible.

## Think bigger – with InterCem.

From individual components to upgrades to complete plants, InterCem provides customized solutions for operators and investors of cement plants all over the world. InterCem is therefore also the right partner for you when it comes to planning, detailed engineering, project management of greenfield projects and conversion/modernization of production plants.

Contact us: The InterCem professionals will also find the right solution for your requirements.



## GLOBAL CEMENT NEWS: PRODUCTS & CONTRACTS



### Saudi Arabia: Sinoma to supply bucket elevators in Riyadh

China National Building Material (CNBM) subsidiary Sinoma CDI has won a US\$6m contract to upgrade cement and raw materials conveyors at Riyadh Cement Company's Riyadh cement plant. The producer has opted for bucket elevators for mechanical transportation, in place of its existing pneumatic conveyors. It expects this to increase energy efficiency and reduce necessary maintenance. The project is due for delivery in early 2025.

Riyadh Cement Company CEO Shoeil Al-Ayed said that the project aligns with the producer's strategic energy reduction initiatives.



### Denmark/Sweden: FLSmidth sells MAAG to Solix

FLSmidth Cement has sold its MAAG gears and drives business to the Sweden-based investment company Solix Group for an undisclosed sum. The transaction is expected to close during the first quarter of 2024 and includes all related assets, including intellectual property, technology, employees and customer contracts. FLSmidth said that the divestment was in line with its Green'26 strategy, which in combination with a greater strategic focus on the service business includes focusing the product portfolio on the core technologies required for a potential green transition in the cement industry.

The MAAG product range includes a wide range of industrial gear solutions for all types of mills and kilns, gear solutions for bucket-wheel excavators and belt conveyors, as well as many other heavy-duty applications used in the cement, mining and other industries. The business has an average turnover of around Euro55-65m/yr.



## Germany: Hanover to stop clinker production

Heidelberg Materials will stop producing clinker at its 0.7Mt/yr Hanover cement plant in Lower Saxony later in 2024, and transition the plant to grinding-only. The producer took the decision following a 'significant drop' in its cement sales, amid low local construction activity and a market shift towards lower-clinker materials. Nonetheless, it intends to raise its capacity utilisation at its 1.0Mt/yr Ennigerloh, 0.9Mt/yr Geseke and 0.4Mt/yr Paderborn cement plants in neighbouring North Rhine-Westphalia. These will supply clinker to the Hanover grinding plant in the future. Heidelberg Materials says that the plant's strategic location will

ensure its continued importance in regional cement supply. Part of the 120-strong workforce at the Hanover plant will remain at the new grinding plant. The company will collaborate with the works council to find 'acceptable solutions' for the remainder of the team, possibly including intra-group transfers to other divisions and locations.

The Calix consortium's on-going LEILAC 2 carbon capture project will now move from the Hanover plant to another Heidelberg Materials plant. Australia-based Calix is collaborating with Heidelberg Materials to identify a suitable new site as quickly as possible.



## Latvia: Carbon capture plant for Brocēni

Schwenk Latvija plans to build a 750,000t/yr carbon capture system at its 2Mt/yr Brocēni cement plant. The producer has hired Norway-based Capsol Technologies to conduct a CapsolEoP carbon capture feasibility study at the plant. Schwenk Latvija is a member of the CCS Baltic Consortium, which achieved provisional inclusion on the European Commission's list of Projects of Common Interest in November 2023.

Schwenk Northern Europe CEO Reinhold Schneider said "Checking the best carbon capture methods and how they can be integrated with our production process is a crucial task for us on the way to carbon neutrality, and likely the major investment direction for the coming decade. To that end, we are excited to investigate the energy consumption and the scale of equipment required for carbon capture at the Brocēni plant, if potentially partnering with Capsol for this challenge."

Capsol Technologies CEO Jan Kielland said "We are excited to work with Schwenk, one of the most innovative building materials' producers in Europe, which has constantly improved its processes to reduce emissions since operations started at

the Brocēni plant's new kiln line in 2010. With this feasibility study, we are taking another step towards building a position as the preferred carbon capture technology provider for cement."

Capsol's project pipeline includes 10 large-scale cement projects in the sales engineering and engineering studies phase. The total CO<sub>2</sub> capture capacity of these projects is 11Mt/yr.

## Ukraine: Investigation launched into CRH purchase of Buzzi assets

The Antimonopoly Committee of Ukraine (AMCU) has launched an investigation into Ireland-based CRH's acquisition of certain Central-Eastern European assets of Italy-based Buzzi Unicem. The assets in question include two Ukrainian cement plants. The AMCU will assess the potential impacts of the consolidation on the cement market in Ukraine. The parties announced the deal in June 2023, and expected to conclude it in September 2024. The AMCU first rejected CRH's application to it in September 2023, but subsequently agreed to reopen its examination of the deal in October 2023.



## Switzerland: New CEO for Holcim

**H**olcim has appointed Miljan Gutovic as its new chief executive officer (CEO), effective 1 May 2024. Gutovic will replace Jan Jenisch, who will continue in his role as chair, for which he is set to stand for re-election at the group's upcoming 2024 Annual General Meeting. Jenisch is also tasked with leading the planned US listing of Holcim's North American business (See Page 48).



An Australian national, Miljan Gutovic has served on Holcim's Group Executive Committee since 2018, including as its regional head of Middle East and Africa, regional head of Europe and head of operational excellence. Holcim said that Gutovic's area leadership helped to strengthen its market positions and deliver industry-leading margins. He also succeeded in advancing decarbonisation as a driver of profitable growth. Prior to joining Holcim as head of marketing and innovation in March 2018, Gutovic spent 12 years with construction chemicals producer Sika, where he became area manager Sika Middle East in January 2016. Gutovic has a civil engineering background and holds a PhD in Engineering from the University of Technology Sydney, Australia.

Miljan Gutovic said "I thank the board of directors for trusting me to lead Holcim into its next chapter of success. As a civil engineer who is passionate about the construction industry, Holcim is the best company to be part of. With decarbonisation and advanced technologies transforming how we build, there has never been a more exciting time for our sector. I look forward to working with the Holcim teams around the world to advance our leadership."

## We look to the future with confidence!



**BI-METAL  
AND  
WEAR-  
CASTINGS**

 **HARDTOP**  
Gießereitechnologie  
GmbH

Reichelstrasse 23  
D-39124 Magdeburg  
Germany

phone: +49 (0) 391 532969-0  
fax: +49 (0) 391 532969-21  
e-mail: [sales@hardtop-gmbh.com](mailto:sales@hardtop-gmbh.com)  
web: [www.hardtop-gmbh.com](http://www.hardtop-gmbh.com)



## Switzerland: Cement sales fall in 2023

Swiss cement shipments dropped by 10% year-on-year to 3.7Mt in 2023, from 4.1Mt in 2022. Shipments declined across all quarters, including by 10% quarter-on-quarter in the third quarter. Cement with a reduced clinker factor grew to account for 96% of shipments from 95%, and rail shipments rose to 38%. Ready-mixed concrete plants received 73% of shipments, and building sites 21%.

The Swiss cement association, Cemsuisse, said that it anticipates continued uncertainties and high import pressures in 2024.



## UK: Caudon investigating carbon capture with Petrofac

Aggregate Industries has engaged energy engineering firm Petrofac to investigate a CO<sub>2</sub> capture project at its Caudon cement plant in Staffordshire. Petrofac is currently conducting early engineering assessments to identify CO<sub>2</sub> capture opportunities. This includes technology selection for any future project. The intention is to store up to 0.6Mt/yr of CO<sub>2</sub> from the plant under the Irish Sea as part of the cross-industry Peak Cluster carbon capture and storage (CCS) project.

Aggregate Industries' decarbonisation manager Luke Olly said "Aggregate Industries is excited to be launching this carbon capture study, as we are aiming to fully decarbonise our cement plant by 2030. This technology is an important part of our strategy."

Petrofac head of business development energy transition projects, Alex Haynes, said "We're looking forward to working with Aggregate Industries UK in finding a way to reduce the carbon footprint of its cement products."

## UK: Heidelberg Materials UK achieves BES 6001 standard

Heidelberg Materials UK has received certification to the revised BES 6001 standard across its entire business. The Framework Standard for Responsible Sourcing of Construction Products, version 4.0:2023, emphasises sustainable procurement and supply chain engagement, alongside environmental aspects such as biodiversity. It covers products including cement, ground granulated blast furnace slag (GGBFS) and concrete. The producer says that this will help it to secure additional green building certification scheme credits.



**You think that the fire and explosion protection of your coal handling & processing is OK because you like to think that.**

**It would be better if you knew it for sure.**

**Let an expert look into it. You will be surprised. Normally what you will learn from it will be worrisome!**

**But only then can you do the necessary.**

**Coal Mill Safety Pte Ltd**  
[www.coalmillsafety.com](http://www.coalmillsafety.com)  
[info@coalmillsafety.com](mailto:info@coalmillsafety.com)

## Switzerland: Holcim plans 2024 shopping spree

Holcim says that it aims to conclude 15-20 new acquisitions in 2024, and potentially 'many more.' The value of individual deals ranges from US\$5.78-115m, but might possibly exceed US\$230m. Holcim says that it is focusing on growing its construction waste recycling business in Belgium, France, Germany and the UK, as well as its aggregates business in Eastern Europe.



# KNEPPER

Precise **DEMOLITION & DISMANTLING**  
for a future-oriented industrial  
landscape.



## GLOBAL CEMENT NEWS: *EUROPE*



### Europe: Big plans for Neustark

Carbon capture and storage (CCS) equipment developer and supplier Neustark says it plans to more than double the number of its CO<sub>2</sub> storage sites in Austria, France, Germany, Switzerland and the UK from 14 to 34. Neustark's process turns captured CO<sub>2</sub> and existing mineral waste streams into useful limestone. Building materials producers lease Neustark's storage sites to produce reduced-CO<sub>2</sub> alternatives such as recycled concrete. The sites currently have a total storage capacity of 5000t. Existing customers include Holcim.

Neustark CEO Johannes Tiefenthaler said "Neustark is scaling up rapidly, and we're well on track to achieve our aim of permanently removing 1Mt of CO<sub>2</sub> by 2030. Our global goal is a series of reliable, region-specific CCS facilities that can be replicated anywhere, offering immediate sustainability benefits to local supply chains."

### Denmark: FLSmidth to sell cement unit

FLSmidth says that it plans to sell its cement equipment business. The business provides FLSmidth's processing equipment and services for cement plants around the globe. FLSmidth will now explore its possible divestment options in order to 'maximise' the business' 'full potential,' while also serving to strengthen the supplier's remaining mining business' market-leading position in its sector.

Chair Tom Knutzen said "I am truly proud of what we have achieved with our cement business for more than 140 years. I firmly believe the business is well positioned for future success and that it has a significant role to play in the decarbonisation of cement. However, when reviewing the long-term options for FLSmidth as a business, for our customers and for our shareholders, we have concluded that a separation of ownership could be beneficial for both the mining and cement businesses."

CEO Mikko Keto said "Our cement business has shown robust performance and good strategic progress over past years. This gives me great comfort in the cement business' ability to continue its positive journey, also – and maybe even more so – under another ownership than FLSmidth's."



Jacob Winskell, *Global Cement Magazine*



Fulda (Hesse)  
city centre, with the  
cathedral behind.

Source: Heide Pinkall  
via Shutterstock.

## GERMAN SUSTAINABILITY

The intensification of a long-running theme, sustainability, has been the main trend in the news from Central Europe's largest cement industry so far in 2024.

On 4 January 2024, think tank Agora Energiewende reported that Germany's CO<sub>2</sub> emissions were at their lowest since the 1950s - down by over 50% from 1990 levels.<sup>1</sup> Agora Energiewende cautioned that the statistic does not straightforwardly signal the success of CO<sub>2</sub> reduction measures. Another emissions-reducing factor was a general production slump across German industries, which shrank by 2% in economic output in 2023.<sup>2</sup> Overall, German gross domestic product (GDP) grew in just one quarter of the year (in the second quarter, by 0.1% quarter-on-quarter). It merely stagnated in the first and third quarters, before declining by 0.3% quarter-on-quarter in the fourth quarter of the year and by 0.3% year-on-year for the full year. Construction output grew by 0.2%, but the sector showed strain amid high costs, declining financing conditions and a labour shortage. Compounding the cost troubles were high cement prices - up by 42% year-on-year in the first half of 2023. In September 2023, the German Cement Association (VDZ) forecast a 7 - 10% year-on-year drop in cement demand for the year, to 25.2 - 26.1Mt.<sup>3</sup> Meanwhile, the German construction sector's 2.7% year-on-year reduction of its emissions to 109Mt in 2023 was behind EU targets for the fourth consecutive year.

### Cement projects

In the past six months, the global industrial carbon capture revolution has continued its acceleration in Germany. One host plant is Phoenix Zementwerke's Beckum cement plant, where a capture pilot with partner GEA demonstrated the possibility of a 90% emissions reduction in September 2023. GEA, which is based close to the Beckum cement plant in Düsseldorf, North Rhine-Westphalia, commands a portfolio that currently includes amine-based carbon capture systems, and may also include ammonia-based systems in future.<sup>4</sup>

Holcim Deutschland has three carbon capture projects in progress across Germany. The company is also engaged in one-year active testing of Germany-based Hereon's PolyActive membrane carbon capture technology at its Höver cement plant in Lower Saxony. All the way north in coastal Schleswig-Holstein, Holcim Deutschland is upgrading its Lägerdorf cement plant with an oxyfuel kiln to facilitate carbon capture for utilisation in an upcoming synthetic hydrocarbons plant. When commissioned in 2029, carbon capture will turn the Lägerdorf cement plant carbon neutral. The Lägerdorf team's efforts are already



vdz

# 9th International VDZ Congress

6 – 8 November 2024  
Düsseldorf, Germany

Registration  
is now open

©Heidelberg Materials AG/Steffen Fuchs

The **VDZ Congress** is the international scientific forum for the cement industry, focusing on **process technology**, **digitalisation**, **resource efficiency** and the **decarbonisation** of the entire cement and concrete value chain. Register now!



T +49 (0) 211 45 78 342  
info@vdz-congress.org  
[www.vdz-congress.org](http://www.vdz-congress.org)

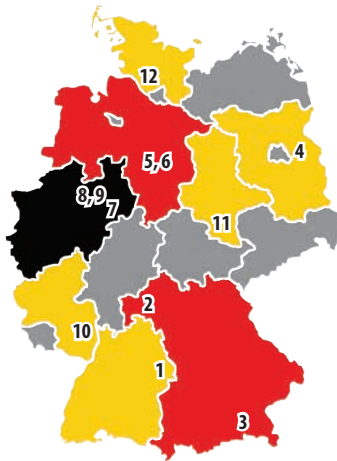
**XDH** energy

CO<sub>2</sub> C<sub>2</sub> C<sub>2</sub> C<sub>2</sub>  
WHATEVER YOUR CO<sub>2</sub>!

[xavier.dhubert@xdh-energy.com](mailto:xavier.dhubert@xdh-energy.com)

**Equipment, systems, & consulting for process optimization, energy usage reduction, and decarbonation**

- Alternative Fuels: Solid [waste and biomass] processing; & Gaseous [biogas, syngas] production
- Combustion: kiln & calciner burners, hydrogen boosting, oxygen enhancement with H<sub>2</sub>&O<sub>2</sub> supplied from electrolyzers
- APC [Air Pollution Control] – dry solutions, for compliances and “carbon capture readiness”
- WHR/ORC [Waste Heat Recovery / Organic Rankine Cycle] for self-generation 24/7 of decarbonated electricity,
- Process Improvement through automatic samplers, on-line analyzers, and innovative instruments,
- EaaS [Energy as a Service] solutions, microgrids, energy storage, CO<sub>2</sub> capture and utilization (methanation, accelerated carbonation, ...)



Key: Multiple projects: Two projects: Single Project: None

## BADEN-WÜRTTEMBERG

1. Schwenk, Mergelstetten, Oxyfuel, ThyssenKrupp Industrial Solutions

## BAVARIA

2. Heidelberg Materials, Lengfurt, amine-based solvent, BASF

3. Rohrdorfer, Rohrdorf, amine, Andritz

## BRANDENBURG

4. Cemex Deutschland, Rüdersdorf, amine-promoted buffer salts, CarbonClean

## LOWER SAXONY

5. Holcim Deutschland, Höver, membrane, Hereon

6. Heidelberg Materials, Hanover, amine, Leilac\*

## NORTH RHINE-WESTPHALIA

7. Heidelberg Materials, Geseke, Oxyfuel

8. Holcim, Beckum, amine, ThyssenKrupp Uhde

9. Phoenix Zementwerke, Beckum, amine, GEA

## RHINELAND-PALATINATE

10. Buzzi Unicem, Gölheim, calcium looping, ANICA

## SAXONY-ANHALT

11. Thomas Gruppe, Karsdorf, calcium looping, Sumitomo SHI FW

## SCHLESWIG-HOLSTEIN

12. Holcim Deutschland, Oxyfuel, Linde Engineering and ThyssenKrupp Industrial Solutions

\*Heidelberg Materials and Leilac are currently selecting a new site for their Leilac-2 carbon capture project after Heidelberg Materials announced the upcoming suspension of clinker production at the plant on 26 January 2024.

internationally decorated: the project won a COP28 Presidency's Energy Transition Changemaker award, and the Outstanding Project award for Germany, at the COP28 climate conference in the UAE in December 2023.

Another possible contender for 'Germany's first carbon neutral cement plant' is Heidelberg Materials' Geseke cement plant in North Rhine-Westphalia, where Germany's own global cement multinational plans to commission a carbon capture system and accompanying oxyfuel kiln by 2029. The project commenced on 1 January 2024, with Euro191m-worth of funding from the EU Innovation Fund. When operational, the Geseke installation will capture 700,000t/yr of CO<sub>2</sub> for transmission to project partner Wintershall Dea's North Sea hub for storage under the sea.

## Other news

Heidelberg Materials' German aggregates subsidiary Heidelberg Materials Mineralik partnered with UM Recycling in December 2023 to advance the use of construction-demolition waste (CDW) in the production of cement and concrete in the Rhine-Main Metropolitan Area (FRM). Heidelberg Materials operates a grinding plant in Mainz and multiple ready-mix concrete batching plants around the FRM.

German sustainable cement efforts received a boost in late 2023 with the passing of the European Empowering Consumers Directive. The directive requires Germany and other EU member states to regulate 'greenwashing' practices. Under the new schema, labels will no longer be able to incorporate claims about products' carbon footprints that are based on offsetting.

**Opposite:** Map of Germany showing the locations of all cement plant carbon capture projects known to Global Cement. States are coloured by their total number of projects.

Source: Global Cement research.<sup>5</sup>

## Conclusion

Current developments in Germany can be a reliable guide to upcoming transformations in cement production around the world in years to come. In the first quarter of 2024, the picture is one of full-chain emissions reduction, in which carbon capture and storage or utilisation plays a crucial part. The goal is clear: complete decarbonisation of cement production. As the 2030 interim deadline draws near, carbon capture projects like Holcim Deutschland's in Lägerdorf and Heidelberg Materials' in Geseke can hardly conclude soon enough.

## References

1. VÖZ, 'Das 2021/2022 Zementdokument,' November 2022, [www.zement.at/downloads/downloads\\_2022/VOEZ\\_ZementDokument\\_2021\\_2022\\_Stand\\_2023\\_März\\_01.pdf](http://www.zement.at/downloads/downloads_2022/VOEZ_ZementDokument_2021_2022_Stand_2023_März_01.pdf)
2. The World Bank, GDP (current US\$) - Switzerland, Austria, <https://data.worldbank.org/indicator/NY.GDP.MKTP.CD?end=2021&locations=CH-AT&start=2006>
3. Cemsuisse, 'Zementlieferungen 4. Quartal 2022,' 9 January 2023, [www.cemsuisse.ch/app/uploads/2023/01/Lieferstatistik\\_4.-Quartal-2022.pdf](http://www.cemsuisse.ch/app/uploads/2023/01/Lieferstatistik_4.-Quartal-2022.pdf)
4. GEA, 'Globale Erwärmungsziele – Verstärkter Einsatz von Technologien zur CO<sub>2</sub>-Reduzierung und Kohlenstoffabscheidung,' 9 August 2021, [www.gea.com/de/stories/getting-tough-on-industrial-emissions-with-co2-abatement-and-carbon-capture-technologies.jsp](http://www.gea.com/de/stories/getting-tough-on-industrial-emissions-with-co2-abatement-and-carbon-capture-technologies.jsp)
5. European Commission, 'JRC Technical Report,' 2023, [https://publications.jrc.ec.europa.eu/repository/bitstream/JRC131246/JRC131246\\_01.pdf](https://publications.jrc.ec.europa.eu/repository/bitstream/JRC131246/JRC131246_01.pdf)



Heidelberg Materials' Geseke cement plant, North Rhine Westphalia.

Source: Heidelberg Materials.

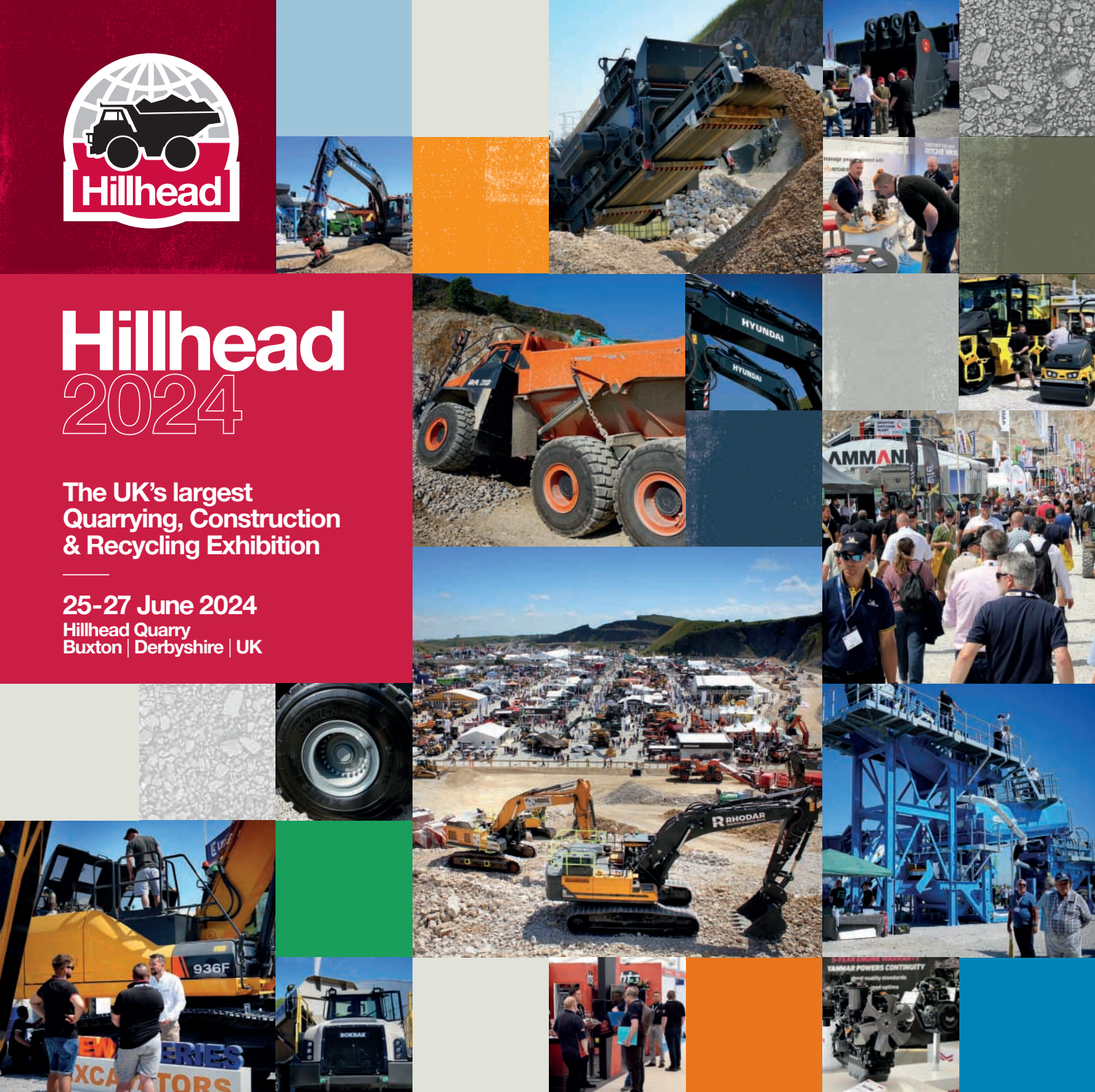




# Hillhead 2024

The UK's largest  
Quarrying, Construction  
& Recycling Exhibition

25-27 June 2024  
Hillhead Quarry  
Buxton | Derbyshire | UK



**Register now!**

Sign up for your  
free visitor ticket at  
[hillhead.com/register](https://hillhead.com/register)



Email: [hillhead@qmj.co.uk](mailto:hillhead@qmj.co.uk)  
Phone: +44 (0) 115 945 4367



Join the conversation  
@Hillheadshow #hillhead2024

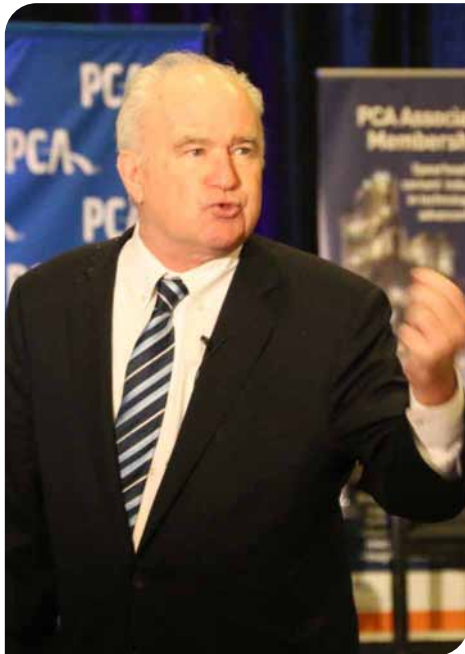


## North America: Holcim to separate and list North American business

**H**olcim has announced plans for a full capital market separation of its North American business. Subject to shareholder approval, it will subsequently list the business in the US in the first half of 2025. The group will communicate the final structure of the separation, which it expects to execute as a spin-off, later in 2024. Reuters has reported that Holcim chair and CEO Jan Jenisch said that the North American business may attract a valuation of US\$30bn upon listing, with Holcim retaining no stake. The business recorded an estimated earnings before interest, taxation, depreciation and amortisation (EBITDA) margin of over 27% in 2023. Following the US listing of the US business, Holcim itself expects to continue its inclusion in the Swiss Market Index in Switzerland.

Jenisch said "Holcim has reached a new level of financial performance and a superior earnings profile with industry-leading margins and a strong balance sheet. The success of our North American business makes it the leading pure-play building solutions

company in the region. With a US listing, we will unleash its full potential to be the partner of choice for our customers in one of the world's most attractive construction markets. As we fully capitalise on the region's infrastructure and construction boom, we will accelerate growth and unlock value for stakeholders."



## US: PCA expects US economy to weaken

**P**ortland Cement Association (PCA) chief economist and senior vice president of market intelligence Ed Sullivan (left) forecast a recovery of the US economy in the second half of 2024 at the World of Concrete conference in Las Vegas, Nevada. However, Sullivan told attendees that the economy will 'gradually weaken' in the first half of the year. The anticipated weakening is compounded by the end of Covid-19 relief programmes, delayed monetary policy effects and credit tightening. Supporting growth throughout the year are some of the US\$550bn infrastructure investments under the Infrastructure Investment and Jobs Act. The US government says that 40,000 new projects under the act are either in progress or completed.

## Brazil: Votorantim to spend big until 2028

**V**otorantim Cimentos plans to invest US\$1bn to expand its Brazilian operations in the period up to the end of 2028. US\$304m-worth of the investments are already underway at the start of 2024. The investments include cement plant projects to raise Votorantim Cimentos' Brazilian cement production capacity by 8.8% to 37Mt/yr. These include a US\$162m investment in a 20% capacity expansion to its Votorantim cement plant and a US\$60.8m, 1Mt/yr expansion to its Salto de Pirapora plant. Further aims are to ensure structural competitiveness, raise energy efficiency and digitise operations, including applying artificial intelligence (AI) to freight. The producer expects its earnings before interest, taxation, depreciation, and amortization (EBITDA) to eventually rise by US\$263/yr between 2023 and 2028 as a result.

## Argentina: Shipments fall in 2023

**C**ement shipments across Argentina totalled 12.6Mt nationally in 2023, down by 3.2% year-on-year from 13Mt in 2022. The Portland Cement Manufacturers Association (AFCP) attributed this to the continuing 'paralysis' of private and public construction projects. The Construction Index dropped by 7.9% year-on-year in 2023.



Sustainable Strength through Innovation



# Join us in Denver!

## April 28-May 2



## IEEE - IAS/PCA Cement Conference

The biggest cement industry conference of the year!

On the  
Agenda



- ▶ Unrivaled technical content
- ▶ Process and professional development training sessions
- ▶ Exhibitors showcasing their latest products and services
- ▶ An exciting spouse program



Visit [CementConference.org](http://CementConference.org)  
for more information

Join us at the most prestigious gathering of  
cement and concrete industry professionals.





## US: Eagle's sales rise

Eagle Materials recorded sales of US\$1.78bn in the first nine months of the 2024 financial year. This corresponds to a rise of 6.2% year-on-year from the corresponding period of the 2023 financial year. The producer's heavy materials sales rose by 18% to US\$889m, and its cement sales volumes rose by 2% to 6Mt. As a result, Eagle Materials raised its net earnings by 11% to US\$401m.

## Mexico: Cemex lists Top 50 start-ups

Cemex Ventures, the corporate venture capital and open innovation unit of Cemex, has published its fifth annual Top 50 Contech Startups list for 2024. The Top 50 lists the start-ups operating in the global construction technology sector that Cemex Ventures believes show the greatest disruptive potential. The unit evaluates start-ups across four strategic areas: green construction; enhanced productivity; construction supply chain; and future of construction.

In 2023, global construction technology investments totalled US\$3.03bn, down by 44% year-on-year due to macroeconomic factors impacting funding. Investments in enhanced productivity accounted for 45% of the total, and investments in green construction for 24%.

## US: Membrane CO<sub>2</sub> capture for Holly Hill

Holcim US, in partnership with The Ohio State University and GTI Energy, will install membrane carbon capture technology at its Holly Hill, South Carolina, cement plant. The project is partly funded by US\$7m US Department of Energy grants. The partners aim to capture 99% of the plant's CO<sub>2</sub> emissions.

GTI Energy vice president of carbon management and conversion Don Stevenson said "This project will showcase the power of collaboration and innovation in tackling the complex challenge of transitioning to cleaner energy systems. The development and implementation of cost-effective carbon capture technologies are key to meeting our decarbonisation goals."

## US: Aker and MAN sign CCUS MoU

Aker Carbon Capture and MAN Energy Solutions have signed a Memorandum of Understanding (MoU) to explore carbon capture, utilisation and storage (CCUS) and CO<sub>2</sub> compression opportunities in North America. The collaboration will combine Aker Carbon Capture's amine capture technology with MAN Energy Solutions' compressor technology to provide standardised and modularised solutions, with optimised energy consumption and delivery time. Both parties are currently participating in the Brevik capture and storage project with Heidelberg Materials Northern Europe in Norway. Rystad Energy has forecast potential capture capacity across North American industries of 200Mt/yr by 2030.

Aker Carbon Capture head of North America Jonah Margulis said "This agreement will strengthen our position to remove and reduce carbon emissions from industries and energy solutions, which is supported by strong incentives from the US government."

MAN Energy Solutions head of sales and project management, carbon capture and storage, Marco Ernst said "We are delighted to work with Aker Carbon Capture, which appreciates our comprehensive expertise in compressor solutions in general and in the area of CO<sub>2</sub> compression in particular."



## US: New low-carbon coalition

A new coalition for the scaling and deployment of low-carbon building materials, the creation of new clean cement and concrete jobs and the promotion of environmental justice was launched in January 2024. Called the Decarbonized Cement and Concrete Alliance (DC2), it comprises alternative cement developers Biomason, Brimstone, Ciment, Fortera and Terra CO<sub>2</sub>, sequestration company Blue Planet Systems, circular concrete producer CarbonBuilt, biogenic limestone producer Minus Materials, hydrothermal processing technology developer Queens Carbon and electrified cement production technology developer Sublime Systems. DC2's areas of engagement in policy will include tax credits, standards, ecolabeling and subsidisation, in line with the US Department of Energy's Pathways to Commercial Liftoff: Low-Carbon Cement strategy.

CarbonBuilt's government and community affairs manager Sal Brzozowski said "DC2's platform of robust policy, standards and incentives to scale innovative solutions will not only accelerate deep decarbonisation, but also transform the concrete industry from one of the world's largest CO<sub>2</sub> emitters to one of the world's largest carbon sinks."



14-15 MAY 2024

OSLO, NORWAY

# global cemCCUS

## Conference & Exhibition

Carbon Capture for cement and lime  
Transportation and logistics  
Use and storage

Organised by:

global  
cement  
MAGAZINE

**cemCCUS.com**

#cemccus

***Carbon Capture Use/Storage***

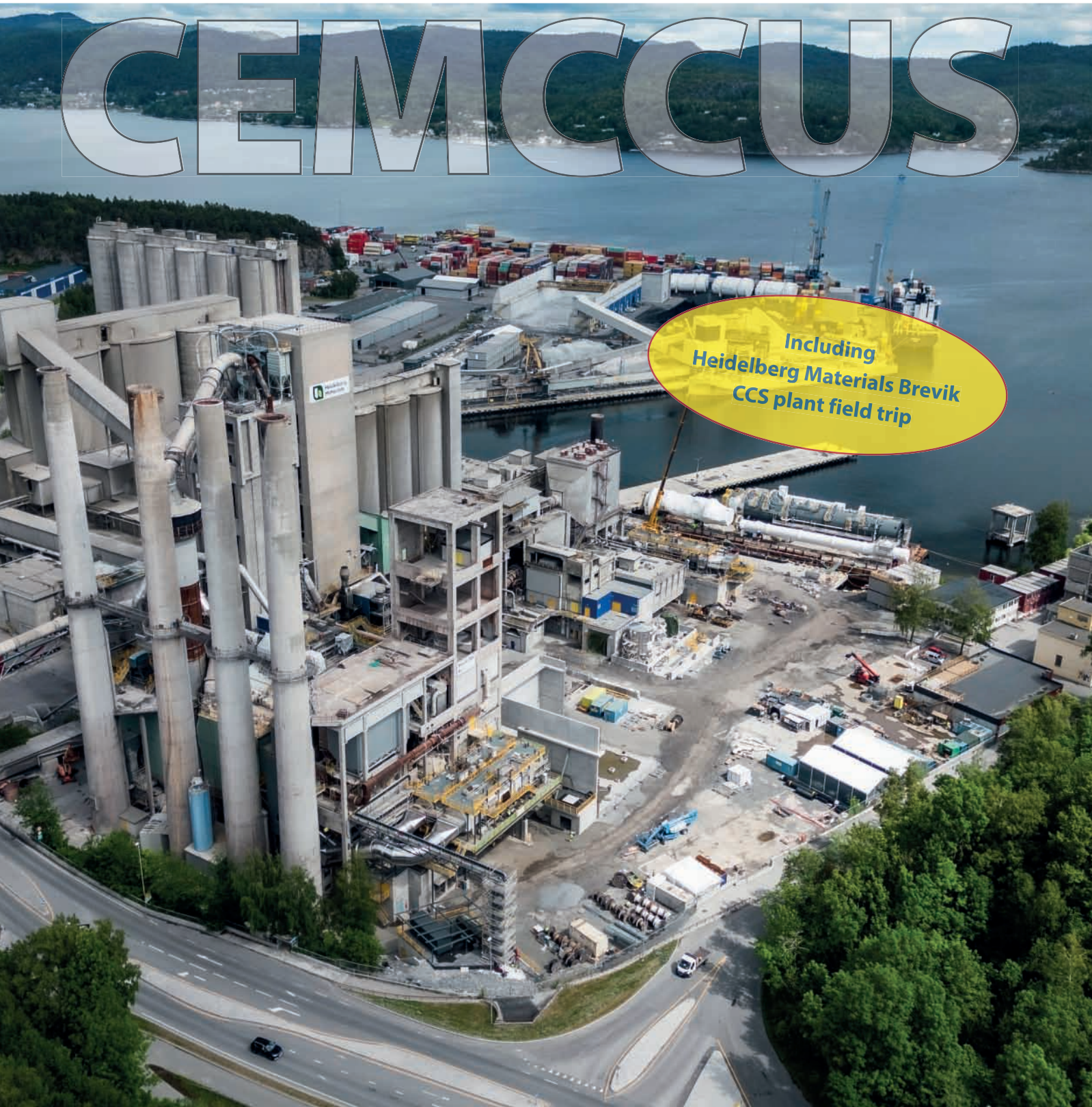
CemCCUS Enquiries

Exhibition and sponsorship:  
paul.brown@propubs.com

Programme and speakers:  
robert.mccaffrey@propubs.com

# CEMCCUS

Including  
Heidelberg Materials Brevik  
CCS plant field trip







## China: Ministry orders producers to focus on ultra-low emissions clinker

The Ministry of Environment and Ecology has enacted new requirements for ultra-low emissions clinker production in the Chinese cement industry. Local press has reported that 50% of clinker production capacity (850Mt/yr) must conform with the standard by 2025, rising to 80% by 2028. The standard encompasses the whole value chain, from raw materials production to transport of the finished product. The ministry expects the regulations, together with similar ones for the coking sector, to reduce domestic CO<sub>2</sub> emissions by 10Mt/yr. In the cement sector, the new requirements will intersect with the upcoming emissions trading scheme (ETS), which is expected to come online by 2025.

The Ministry of Environment and Ecology said "Oversupply and a persistent demand lull has resulted in declining profit and lower operating rates for the cement industry in China for the past three years. Setting up low emission standards and providing policy

incentives for production with higher efficiency and lower environmental impact will help promote green transformation within the industry, while driving out inefficient capacities."



Shanghai, China.

## Philippines: CEMAP warns of layoffs

The Cement Manufacturers Association of the Philippines (CEMAP) has warned that cement sector workers could be laid off due to competition from imports from Vietnam. It stated that local demand for cement has fallen and that the production capacity of the cement industry far exceeds expected demand in 2024. The association noted that the cement industry employs 130,000 personnel, both directly and indirectly.

CEMAP said in a statement, "The Philippine cement industry has been forced to downscale operations as imports continue to cannibalise the market and, in certain cases, lay off workers due to the worsening market situation. With the projected increase of cement imports, manufacturers will be forced to further downscale operations until demand recovers or importers cease dumping."

National cement production capacity is reported to be 53Mt/yr in 2024 compared to anticipated demand of 34.5Mt. CEMAP says that 7Mt of cement was imported in 2023 despite selected anti-dumping tariffs. It expects this to rise in 2024 due to a contraction in the Vietnamese market.

## Azerbaijan: Cement production rises in 2023

Cement production in Azerbaijan increased by 4.6% year-on-year to 3.73Mt in 2023, according to data from the State Statistics Committee. Clinker production rose even more sharply, by 37%, to 3.87Mt. There was growth of 32% year-on-year in the overall value of building materials in 2023, to US\$694m.

## China: Shanshui expects big loss

China Shanshui Cement expects its full-year loss to exceed US\$120m in 2023. Reuters has reported that the producer attributes the anticipated decline to a 'substantial' drop in cement sales prices.

## China: Maerz supplies two lime kilns

Switzerland-based Maerz has commissioned two lime kilns for Guizhou Gangli Xinmin New Materials' plant in Guizhou province. The new plant includes a 600t/day R4S kiln and an 800t/day R5S kiln. Both kilns are coal fired. This is the first time Maerz has supplied kilns to Guizhou Gangli. As part of the project, Maerz supplied engineering and key equipment as well as technical support services for the commissioning and firing of the kilns. Maerz's long-standing local partner Shanghai Maiyao built the turnkey plants and will operate them on behalf of the customer for the next few years.







### Uzbekistan: Production rises slightly

Cement production in Uzbekistan was 11.1Mt nationally from January to November 2023, up by 2.5% year-on-year, according to data from the Statistics Agency of Uzbekistan. The Uzbek Building Materials Producers' Association expects annual production to eventually rise by 3Mt/yr after China Energy International Group Samarkand Cement commissions its upcoming Samarkand cement plant.

In related news, the Uzbek government reduced the tax on limestone for use as a raw material in cement production by 73% to US\$0.48/t in early 2024.



### India: New plant for Godda?

Adani Group has announced plans to build a new cement plant, possibly at Godda, in Jharkhand's Santhal Pargana Division. The producer recently established a 1.6GW power plant in Godda.

The group said "In keeping with our group's expansion plans, we are conducting a feasibility study to set up a cement factory, most probably in Godda. A proposal will be sent to government soon. The proposed plant will further boost the economy of Godda and Santhal Pargana. The proposed plant will utilise fly ash from our existing power plant here as raw material. At present, the fly ash is being sent to the ACC cement plants in Jhikpani and Sindri."

### Nepal: LC3 to be adopted

The Cement Manufacturers Association (CMA) has signed a memorandum of understanding (MoU) with the Department of Mines and Geology and non-governmental organisation Technology and Action for Rural Advancement (TARA) for the adoption of limestone calcined clay (LC3) cement in Nepal. The parties say that LC3 cement can reduce CO<sub>2</sub> emissions by 40% and reduce the amount of coal used in cement production.

### India: ACC's sales rise by 12%

ACC grew its sales to US\$1.75bn in the first nine months of the 2024 financial year, up by 12% year-on-year. Its net income multiplied by a factor of five, to US\$167m.

Local press has reported that whole time director and CEO Ajay Kapur said "ACC's financial performance has seen a complete turnaround in the last 12 months. Recent capacity additions have taken the Adani Group's cement capacity to 77.4Mt/yr. This will enable volumes and revenues growth on a sustainable basis." Looking to the full 2024 financial year and beyond, Kapur added "Purchases of low-cost petcoke will help to further optimise fuel costs in the coming quarters."

### Thailand: SCG sales slide in 2023

Siam Cement Group (SCG) reported sales of US\$14bn in 2023, down by 12% year-on-year from 2022 levels. Nonetheless, its profit grew by 21% to US\$726m, which it largely attributed to gains from fair value adjustments of investments in the first half of 2023. The group's cement and construction products business incurred a loss due to local impairments of cement plant assets.

As of 31 December 2023, SCG's total assets amounted to US\$22bn, down by 1.4% year-on-year from the end of 2022.

### Bangladesh: Crown's new unit starts

Crown Cement (formerly MI Cement) officially commenced production from its Munshiganj grinding plant's new Unit 6 on 14 January 2024. Local press has reported that the new unit increases the Munshiganj plant's capacity by 72% to 5.7Mt/yr. MI Cement Factory previously signed a US\$22.8m syndicated loan facility for the expansion with Eastern Bank Limited on 28 May 2023. The producer said that delays with suppliers and currency crises postponed its delivery of the project. It first postponed the expansion – at that time valued at US\$54.6m – due to domestic overcapacity amid the Covid-19 outbreak, in October 2020.





David Perilli & Peter Edwards, *Global Cement Magazine*

## COMMENT ON KYRGYZSTAN

Kyrgyzstan is an up-and-coming cement market in Central Asia, with news of a new plant and continuing data showing that cement production has grown.

Kyrgyzstan's newest cement plant project, located at Chüy, was first announced by the government in mid-2022 when it signed an investment agreement with a consortium comprising representatives from Terek-Tash and ZENIT. More information on the unit emerged in January 2024,

when the Russian-Kyrgyz Development Fund revealed that it made a loan of US\$45m towards the scheme based in the northern Chüy region of the country. The plan is to build a 1.7Mt/yr plant with a budget of US\$160m. Equipment to build the plant is being sourced from companies in China and Russia. Special features of the project include a waste heat recovery (WHR) unit and the use of ash from the Bishkek Thermal Power Plant in the production process. The plant is expected to be launched at some point in 2024.

### Recent production trends

One reason that the government might be keen to build a new plant is because cement production has been on an upward trajectory over the past five years. The one year that production did not grow was 2020, when Covid-19-related lockdowns were at their height. In 2022 it increased by 7% year-on-year to 2.7Mt and the latest data from the National Statistical Committee (NSC) indicates that it rose by 11% year-on-year to 2.6Mt in the 11 months to the end of November 2023. If this rate held in December 2023 then it looks likely that the country will have produced just under 3Mt in 2023.

At the same time the country's exports of cement have also fallen. In November 2023 the government of Kazakhstan's Jambyl Region said that it had found investors to support construction of a railway line between the locale and Kyrgyzstan due to a 'building boom' in the latter.

Separately, in 2023 the Eurasian Development Bank (EDB) said it had earmarked US\$48m for the modernisation of equipment at the Kant Cement plant, operated by Kazakhstan-based United Cement Group (UCG), also in Chüy region. The plant is the biggest in Kyrgyzstan, running five wet process production lines, according to the *Global Cement Directory 2024*. The EDB linked its investment to a hydroelectric project in the country that it is also funding, pointing out that such structures



View over Ala-Too Square, Bishkek, Kyrgyzstan.




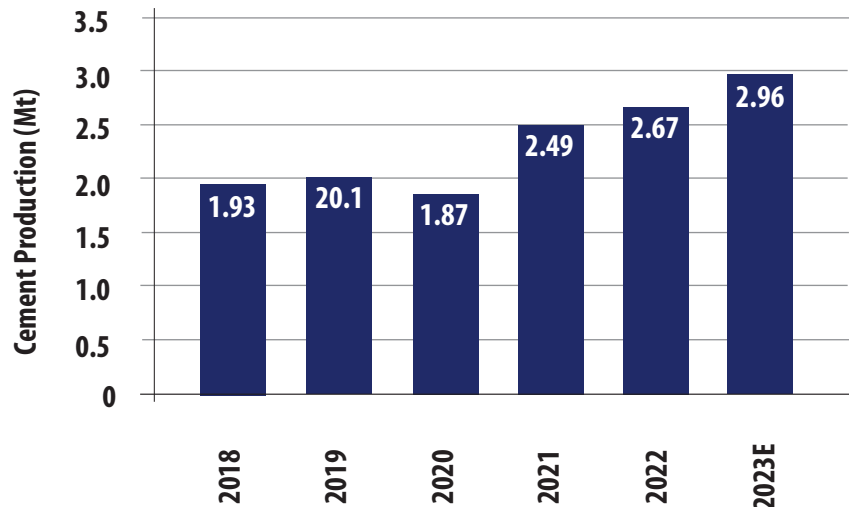
require lots of cement and concrete. This follows a previous upgrade project by owner Kazakhstan-based United Cement Group (UCG) at the plant from 2021 to March 2023. That upgrade involved efficiency and environmental gains, such as installing bag filters and converting a cement grinding mill to a closed circuit. China-based CNBM subsidiary China Triumph International Engineering was the lead project partner.

In early December 2023 UCG announced that it had signed another contract with China Triumph International Engineering to build a new dry production line at the site with a clinker capacity of 0.8Mt/yr. At the time of the announcement, it said that preparation of the construction site had started and that work had begun on installing foundations.

Another Kyrgyz news story of note in recent months was the announcement in October 2023 that the government had effectively nationalised the Kurmentinsky Cement plant in Issyk-Kul Region. The reason why it had done so was unusual because it said that a 93% share in the company running the plant had been transferred to the State Property Management Agency following the death of its former owner. The former owner was Kamchybek Kolbaev, an alleged organised crime boss who had been listed on the US Department of State Transnational Organized Crime Rewards Program and was reportedly killed by state security services in early October 2023. The remaining shares in the plant have been passed to its workers and the government further said that it intends to upgrade the site.

## Concluding remarks

The cement sector in Kyrgyzstan is modest and in need of modernisation. It appears to be having a resurgence at the moment, with production mounting and at least two major plant projects underway. The country is in a compelling position economically and geopolitically given its membership of the Russia-backed Commonwealth of Independent States and its proximity to China. Various projects backed by the latter's Belt and Road Initiative, both underway and forthcoming, would certainly appear to benefit from more efficient local cement production and higher volumes. 



Cement production in Kyrgyzstan, 2018-2023. Value for 2023 extrapolated from first 11 months of 2023.  
Source: National Statistical Committee.



No.	Company	Location	Process	Capacity (Mt/yr)
1	Kant Cement (UGC)	Kant, Chüy	Wet	1.3
2	TechnoLin (UGC)	Issyk Kul	Wet	0.4
3	South Kyrgyz Cement	Kyzl-Kiya, Batken	Dry	1.0
4	Aravan Cement (Southern Building Materials)	Aravan, Osh	Semi-dry	1.0
5	Yuzhno-Kyrgyzsky Cement (Huaxin Cement)	Kyzl-Kiya, Batken	Dry	0.6
6	Kurmentinsky Cement (Government)	Tyupsky, Yssyk	Wet	0.1
ACTIVE TOTAL				4.4
7	Terek-Tash / ZENIT	Kant, Chüy	Dry	1.5 (U/C)
8	ZETH Cement (Tongling Shangeng / Zhu Rongjun)	Kemin, Chüy	Dry	1.0 (U/C)
PROJECT TOTAL				2.5


[Contents](#)
[Subscribe](#)
[Ad Index](#)

## Iraq: Major expansion for Al Douh plant

**A**l-Riyadh Investment Companies Group subsidiary Al-Douh Iraqi Company for Cement Industries plans to expand its Al Douh cement plant's capacity by 58% to 3Mt/yr. The expansion is part of an upgrade involving the installation of a new kiln, a gas-fired captive power plant and a new waste heat recovery (WHR) plant. The WHR plant will provide 30% of the

plant's energy. The US-based International Finance Corporation (IFC) has loaned Al-Douh Iraqi Company for Cement Industries US\$130m on a long-term basis for the project.

The IFC says that it expects the Al Douh cement plant expansion to help boost economic diversification, spur sustainable growth in Iraq and generate 2700 new jobs in Muthanna Governorate.

## Saudi Arabia: Qassim attempting to buy Hail Cement outright

**Q**assim Cement Company has informed investors of its intention to acquire Hail Cement Company outright via a submission on the Saudi Exchange. As part of its offer, Qassim Cement Company plans to increase its own share capital by 23%, in order to issue some of it to Hail Cement Company's shareholders.

## Saudi Arabia: Al Jouf export contract

**A**l Jouf Cement Company has awarded a contract to Rabou Al Taybeh for the export and sale of its clinker. Local press has reported that the contract has a value of US\$8m and a duration of six months, subject to renewal.



## Oman: Oman Cement sales rise

**O**man Cement Company (above) recorded sales of US\$189m in 2023, up by 4% year-on-year from US\$181m in 2022, Reuters has reported. The company's net profit also grew during the year, by 16% to US\$15.1m from US\$13m.

## Middle East: French court upholds Lafarge indictment

**T**he Court of Cassation, France's highest court, has upheld Lafarge's indictment on charges of complicity in crimes against humanity, Reuters has reported. A lower court previously concluded that the company had paid US\$15.5m to armed groups in the Middle East, including ISIS, via its subsidiary Lafarge Cement Syria. In its latest ruling, the Court of Cassation quashed another charge of endangering the lives of employees, on grounds that Lafarge's foreign labour relations are not subject to French law. The group had reportedly not appealed a further charge of financing a terrorist enterprise.

## Oman: Calcined clay plant on the way

**M**iddle East Calcined Clay and Netherlands-based Kaolin Group International plan to build a limestone calcined clay cement plant in Oman. The partners have hired Spain-based turnkey plant engineer IPIAC to supply equipment including its Plug and Clay clay calcination unit. The new plant will produce limestone calcined clay cement with 40% lower CO<sub>2</sub> emissions than ordinary Portland cement (OPC), according to the supplier.

IPIAC previously introduced its Plug and Clay technology in Cuba and Ivory Coast, and is currently retrofitting it to a clinker line in Angola.





## Rwanda: PPC completes Cimerwa divestment

South Africa-based PPC has completed the sale of its 51% stake in the Rwandan cement producer to Kenya-based Devki Group subsidiary National Cement, for US\$42.5m. The divestiture advances PPC's strategic exit of Central and East Africa. As a result, the group's financial position is now cash positive. It had previously reduced its debt by 50% to US\$20.3m from US\$40.7m between March 2020 and September 2023.

PPC CEO Matias Cardarelli said "I am pleased with the timely completion of the sale of our stake in Cimerwa. The disposal allows us to focus on our core Southern African markets, where we see opportunities to drive improved profitability and secure a more sustainable return on capital."



## South Africa: Afrimat draws closer to Lafarge South Africa purchase

Mining and materials company Afrimat says that further regulatory conditions as part of its ongoing acquisition of Lafarge South Africa have been met. The Minister of Mineral Resources and Energy of South Africa has consented in terms of the Mineral and Petroleum Resources Development Act, the Financial Surveillance Department of the South African Reserve Bank has approved the acquisition in terms of the Exchange Control Regulations, and the respective Competition Authorities in Botswana and eSwatini have approved the implementation of the acquisition.

Approval by the Competition Commission is still outstanding but it recommended the transaction to

the Competition Tribunal in November 2023. However, the Competition Commission highlighted 'horizontal overlaps' in the aggregates and ready-mix concrete sectors and recommended that the parties be required to divest assets across the affected sectors.

Afrimat first announced in June 2023 that it had agreed a share purchase agreement with a Holcim Group subsidiary, Caricement, to acquire 100% of the issued share capital of Lafarge South Africa. The proposed acquisition will become unconditional and be implemented once approval by the Competition Tribunal has been obtained.

## Morocco: NovaCim joins APC

NovaCim has joined the national cement association, Association Professionnelle des Cimentiers (APC). NovaCim operates a 1.6Mt/yr plant at Oulad Ghanem in El Jadida Province.

APC represents Asment Temara, Heidelberg Materials subsidiary Ciments du Maroc, Ciments De L'Atlas (CIMAT), LafargeHolcim Maroc and NovaCim. The companies operate 14 integrated cement plants and seven grinding plants between them with a total production capacity of just under 25Mt/yr.

## Saudi Arabia: Producers warn over rising fuel prices

Najran Cement has informed investors via a posting on the Saudi Exchange that it expects its cost of sales to rise by 13% in 2024. This is due to an increase in the price of fuels by its supplier Saudi Aramco. The cement producer noted that the waste heat recovery (WHR) system installed at its Najran cement plant has partly reduced the anticipated impacts on costs.

Meanwhile, Arabian Cement Company has estimated that its production costs will rise by 14% as a result of the price rises. In an addendum to a previous announcement published on the Saudi Exchange, the producer said that it will explore cost reduction strategies.





Interview by Peter Edwards, Global Cement Magazine

# MEDCEM: COMPANY REPORT

Global Cement speaks to Mehmet Ali Ceylan, CEO of Medcem, about his company's global cement operations ...

**Global Cement (GC): Please could you introduce Medcem to our readers?**

**Mehmet Ali Ceylan (MAC):** Medcem Cement Group currently consists of one integrated cement plant, two grinding facilities, one cement import facility, one port and one ready-mix concrete company with eight batching plants. Aside from the production of clinker and cement, the group is also engaged in the trading of cement, supplementary cementitious materials - around 1.5Mt/yr of fly ash and GBFS - and various other materials including, but not limited to, bauxite, flue gas desulphurisation gypsum and bottom ash. The group's 2024 trading volume is expected to exceed 10Mt. The majority of companies within the Medcem Cement Group are privately owned by the Eren family, as with other Eren Holding companies.

**GC: Please could you introduce Medcem's integrated cement factory?**

**MAC:** We commissioned our integrated cement factory in Mersin, Türkiye, and a dedicated port, Medcem Port, in 2015. We initially had one kiln with a clinker production capacity of 11,000t/day (3.5Mt/yr). However, in December 2023, we commissioned a second kiln with a clinker production capacity of 9000t/day (2.9Mt/yr), predominantly to serve export markets. The two lines now provide a combined clinker capacity of 20,000t/day (6.6Mt/yr).

**GC: What products are made?**

**MAC:** We produce ASTM I/II and ASTM IL type cement for the US market, which constitutes around 40% of our sales. We export around 10% of our production as clinker and the remaining 50% of the products are mostly CEM I 42.5 and CEM II 52.5. These are exported to the UK, the EU and the Middle East, but are also sold in Türkiye.

**GC: What fuels are used at the plant?**





Mehmet Ali Ceylan has acted as the executive board member at Eren Holding's cement group companies for over nine years. In May 2023, he was additionally appointed as the CEO of the newly-formed Medcem Cement Group. The company operates cement assets in Türkiye, Cameroon, Tunisia and Cyprus along with soon-to-be operational facilities in multiple locations in the UK and in Europe.



Overview of the Medcem Cement Group plant in Mersin, Türkiye.





Medcem Cement Group's integrated plant is in Mersin, in Türkiye's Mediterranean region.

**MAC:** Our plant uses solid fuels, mainly coal and petcoke, as well as some refuse-derived fuel (RDF), biomass and liquid fuels. Our new kiln will enable us to use more alternative fuels, gradually replacing 50% of coal with alternative fuel by 2028. This will substantially reduce our CO<sub>2</sub> emissions. We perceive it as a critical milestone in Medcem's sustainability initiatives. We expect to start operating a waste incineration unit in the second quarter of 2024 and are working on the supply of organic and inorganic wastes as alternative fuels.

**GC:** What are some ongoing or planned projects at the plant?

**MAC:** As Medcem Cement Group, we approach our sustainability activities not only in terms of reducing our CO<sub>2</sub> footprint, but also from an holistic viewpoint, taking into account water usage footprints and hazardous gases too, with action plans for each. We are concentrating on green energy and want to generate some of the electricity required from renewable sources. Closely related to this, energy efficiency is another important objective. We evaluate every opportunity to save energy within the company.

To this end, Medcem operates a solar energy plant with a capacity of 40MW. We are on the verge of investing in a wind power plant, also with a planned output of 40MW.

In addition, we have an 8.5MW waste heat recovery (WHR) system. A second WHR system with a capacity of 9.54MW will be installed shortly. This system uses Organic Rankine Cycle (ORC) technology to generate power from waste heat coming out of the clinker cooler's exhaust gas. The ORC is projected to be operational in 2024. It represents a substantial advancement in energy efficiency, as it can generate 23% of the electricity consumption of the second line. Our aim is to derive 55% of the plant's energy consumption from renewable sources by 2030.

Another project that we will complete in 2024 is the construction of a state-of-the-art research and development centre. This will primarily be used to develop more sustainable low-CO<sub>2</sub> cement blends so that we can diversify our blended cement product line while also reducing our environmental impact. We're also working on logistics and have started negotiations with a company about electrifying the construction machinery and trucks used in our plant.

The new 9000t/day preheater tower under construction in 2023.







Part of the plant's 40MW solar power plant. Installation of a 40MW wind farm is underway.

Finally, we are following emerging technologies, particularly those in the area of CO<sub>2</sub> capture and storage, with a view to investing in these technologies once we feel confident. The technology to be implemented needs to be economically and environmentally feasible in terms of its installation and operation.

**GC: Which markets are most important to Medcem Cement Group?**

**MAC:** We are an export-oriented company with a unique position among most Turkish and foreign cement manufacturers. We try to diversify our export volumes as much as possible to different regions of the world. However, the US, the Middle East and the UK have become our main markets from a cement export standpoint. Meanwhile, our clinker sales are mostly to the EU.

Medcem Port plays a crucial role in our operation. It is located only 13km from our plant and was constructed to serve the Medcem plant exclusively. At our port, we currently have three berths with the ability to accommodate vessels up to 60,000dwt, while giving minimum 12,000t/day of daily bulk loading guarantee. Aside from some other developments currently going on at our port (such as increasing our cement and clinker storage silos), we are going to extend our berth and add a fourth quay by the end of 2024. This will be an important milestone as we will be able to load even larger vessels. Aside from export sales, around 15% of our production is sold to the domestic market. Around 30% of this is to our concrete division, Medcem Beton.

All of our exports are conducted via sea transportation and around 80% in bulk form. The remaining 20% is shipped either through big bags or sling bags. As for the domestic market, we haul our cement by truck.

**GC: How have raised fossil fuel prices affected the plant?**

**MAC:** We mostly fire imported coal, so coal prices on the international markets play an important role in our finances. We are a big cement producer and hence a big coal consumer. Therefore, considering the risk exposure that we are under, we try to limit our risk by using a hedging mechanism. High and volatile coal prices are also another reason behind our move towards alternative fuels in the coming years.

**GC: Has the plant been affected by the EU Carbon Border Adjustment Mechanism (CBAM)?**

**MAC:** By the commencement of the CBAM in 2026, the cement sector will be significantly transformed. As Türkiye's biggest cement exporter, Medcem feels the pressure and responsibility to be at the forefront of all relevant green initiatives. In this respect, the company generated a sustainability action plan in 2023. This will enable the company to comply with the CBAM regulations. We are also one of the very few companies in Türkiye that has already issued EPD certificates for multiple products.

**GC: How has the business been affected since the start of the Ukraine war and Middle East conflict?**



**MAC:** Before commenting, I want to express my deepest sympathies for all people from all of the nations that have been affected by these wars. I feel uneasy making business-related comments when peoples' lives are at stake, but the former impacted us in terms of high energy costs associated with the scarcity of coal and the latter has had an adverse impact in terms of sales.

**GC: How would you describe Medcem Cement Group's global strategy and how do you envision Medcem Cement Group's position in 2030?**

**MAC:** In 2023, we consolidated the cement companies under Eren Holding into the Medcem Cement Group. We have developed short, medium, and long-term strategic growth and transformation plans for the Medcem Cement Group. Our primary objective is to transform the Medcem Cement Group into a prominent global brand with an international production and sales network in the field of building materials. We aim to establish an extensive terminal network abroad and sell at least 25% of our international exports through terminals we have set up ourselves.

By acquiring ships or chartering vessels, we intend to manage the logistics operations of sales conducted through our own terminals. Additionally, we aspire to achieve a balanced portfolio structure in the long term by acquiring factories abroad. Recognising that evaluating our group

solely as a cement producer may be limiting, we are exploring investment possibilities in different construction product areas. While pursuing quantitative growth, we are also strengthening the qualitative infrastructure of our group to enhance corporate governance. Sustainability, digitalisation and efficiency will be at the forefront of our agenda as we grow both quantitatively and qualitatively.

In line with our global growth strategy, we have a grinding mill in Cameroon and another one in Tunisia, along with an import storage facility in Cyprus. We currently have two ongoing import storage facilities under construction in the UK. The one in London is expected to be commissioned in the third quarter of 2024, while the one in Glasgow is planned to become operational by the end of 2024. We are on the verge of signing some further agreements to set up new import facilities with some terminal operators in Europe and in the US, which will help us to further increase our global footprint.

In summary, our global vision for 2030 is to become a recognised brand in the world not only for cement but for construction materials in general.

**GC: Mehmet Ali Ceylan, thank you for your time today...**

**MAC:** You are very welcome indeed!



Medcem Port is crucially important to the company's development plans.





## Waste Heat Recovery Systems



Power capacity  
**52 MWe**



Avoided CO<sub>2</sub> emissions  
**130.000 TPY**



- / **Waste Heat Recovery** systems
- / **Clean Energy** & Zero CO<sub>2</sub> emissions
- / **Optimisation** & Performances
- / **Environment friendly** / No water
- / **Brownfield** & Multiple layout



[ctp.mi.it](http://ctp.mi.it)





Robert McCaffrey & David Perilli, *Global Cement Magazine*

# AUCBM 2024: REVIEWED

The 26th Arab International Cement Conference and Exhibition (AICCE26) organised by the Arab Union for Cement and Building Materials (AUCBM) took place in Cairo, Egypt, on 15-17 January 2024. The event attracted around 800 delegates, more than 100 exhibitors and 51 papers. Here *Global Cement* reviews selected presentations.

**Matthias Mersmann** of KHD Humboldt Wedag spoke about some of his company's solutions to decarbonise the cement industry - starting with the KHD Rollerpress, a high pressure roller mill, launched in 1985. Matthias stated that the Rollerpress is the most efficient means of clinker grinding. "Alternative fuels," Matthias said to his audience of cement producers, "are certainly part of your future." The company's Pyrorotor reactor allows the use of lumpy and poorly-combustible alternative fuels (AF), including whole tyres, with a long combustion time, producing a lean gas for

use in pyroprocessing. Humboldt Wedag offers both flash tube and rotary kilns for (AF-ready) clay calcination, also offering colour control. According to the VDZ, without CCUS, the ultimate decarbonisation of the cement industry will be impossible. Matthias pointed out that concentration of CO<sub>2</sub> in the process will be vital for the economics of CCUS, which is best achieved by the use of oxyfuel firing - also offered by KHD. Finally, the company offers a digital twin suite for process optimisation. Retrofitting and modernisation will be the driver of decarbonisation in the industry. He concluded:

1. Matthias Mersmann, KHD Humboldt Wedag, stated that "There is no future without cement, and no cement without decarbonisation."



2. Bo Bentsen provided FLSmidth's take on fuel substitution in the global cement sector.



3. Markus Sauer of thyssenkrupp Polysius gave an account of his company's 'Decarbon' technologies.



4. Thomas Guillot, Global Cement & Concrete Association (GCCA), presented aspects of the association's roadmap to net zero.







“There is no future without cement, and no cement without decarbonisation.”

**Markus Sauer** of thyssenkrupp Polysius next gave an account of his company’s own ‘Decarbon’ technologies. The company’s Nucera unit is a technology leader in electrolysis plants to produce green hydrogen and green methanol. NO<sub>x</sub> reduction, second-generation pure oxyfuel burning, automation, and calcined and non-calcined activated clays are all parts of the Polysius portfolio for decarbonisation solutions.

**Dirk Schmidt** of KIMA Process Control presented the company’s Gastemp product. It measures the flow and temperature of process gases by recording the transit time between two microphones of an acoustic pulse across a known distance. Dirk emphasised that conventional approaches to gas flow typically assess Delta P via a pitot tube or differential pressure measurement. However, this can have a margin of error of up to 10% compared to only 1% with the Gastemp. Schmidt remarked that this is better than using a thermocouple. Schmidt finished by mentioning KIMA’s other products including the MillMaster, the KilnCooler and SmartFill.

**Richard Feghali**, Fives FCB, discussed how the company can decarbonise cement production processes with its products. After citing that the company has 12 kilns in the Middle East, he proceeded to describe current projects around the world. These included a new 6500t/day production line for Sococim Industries in Senegal with a targeted alternative fuels (AF) thermal substitution rate (TSR) of 70%, new cement grinding mills for Ciment Québec in Canada that are intended to reduce the clinker factor of the company’s cement, and a cement mill upgrade for Vicat’s Xeuilley cement plant in France. The first two projects are scheduled for commissioning from mid-2024 onwards. Feghali finished his talk by describing Fives’ FCB Horomill grinding system, its clay flash calcination technology and its FCB Rhodax concrete recycling technology. He then explained that, by using all three, a cement producer could potentially halve its specific CO<sub>2</sub> emissions per tonne of cement produced.

**Jens Garbe**, Claudius Peters Projects, set the scene for his presentation by arguing that the profitability of cement production is based on clinker production, and this in turn, is directly proportional to the CO<sub>2</sub> emitted. This then places a greater importance on using blended cements. Garbe focused on how Claudius Peters’ mixing technologies can help cement producers to do this while reducing both power consumption and investment costs. The company offers products for both continuous and batch mixing processes. The key difference between the two mixing approaches is that the former allows



5

for higher capacity but it is less accurate while the latter method handles smaller capacities but is more accurate.

**Faris Gharaibeh**, Beumer, opened by commenting that the Middle East has a lower AF TSR rate than some other regions partly due to a reduced segregation of waste. Focusing on the company’s core AF offering, he then presented its products from storage to conveying to weighing and feeding. After detailing the OptiDock and OptiBulk unloading systems, he moved on to the OptiFeed and OptiLock feeding systems. Notably, the OptiLock uses an air lock process to ensure that a constant level of material can be fed into a cement plant preheater or calciner, while also reducing false air leaking into combustion processes.

**Boris Sassenrath**, Aumund, looked at how cement plants can achieve AF TSRs above 30%. He introduced himself by saying that he had come across from the ‘dark side’ of waste management and had discovered ‘how beautiful life could be’ when he first visited a cement plant! His advice to cement producers was to separate refuse-derived (RDF) fuel production from clinker production because once higher TSRs are targeted, the AF fuel quality needs to increase. He added that cement producers should aim to become independent of the performance of suppliers and take control themselves. Sassenrath suggested that cement producers starting out with co-processing AFs should ‘start small’ with an aim of a return of investment (ROI) within two years. However, he also recommended moving in a step-wise fashion to allow more components to be added to a production line to focus on higher TSRs later on. His

5. Left to right: Prince Naif bin Sultan bin Mohammed bin Saud Al Kabeer (Chairman of the AUCBM Board, Representative of Saudi Arabia), Eng. Ahmed Samir Saleh (Minister of Trade and Industry of Egypt), and Ahmed Shireen Korayem (Chairman of the Egyptian Cement Association), officially opened the event.



6. Minerva Engineering's Hakan Benzer gave a presentation on grinding with the Pamir horizontal stirred bead mill.

7. A<sup>3</sup> & Co's Amr Nadr warned that most decarbonisation efforts are behind 'where they need to be.'



approach was that cement producers should be able to mix three to four different types of AF. Storage on site is required once rates surpass 40% and, once they surpass 50-60%, producers should start dosing AF into the main burner.

**Thomas Guillot**, Global Cement and Concrete Association (GCCA), concurred that concrete is essential but needs to be decarbonised. The GCCA now has representation from around 80% of cement producers outside of China, and continues to work with a plethora of associations (including *Global Cement Magazine*) to get its message out worldwide. He said that there are no silver bullets for decarbonisation, and that all parts of the value chain have their part to play, including CCUS. Thomas told delegates that LC3 low-carbon blended cement is being produced in nine plants at the moment, but will be produced in more than 40 plants by the end of 2025. "The roadmap is there to define what has to change to allow you to get to the final destination - including the legislation that must be in place. Secondly, you must define who will pay for the changes that must be made." Carbon pricing is a

crucial area for future development, for companies and governments, while project finance needs to be accelerated in order for the cement industry to decarbonise in timely fashion, before the planet bursts through into a catastrophic 2°C warming scenario.

**Amr Nadr** of A<sup>3</sup> & Co suggested that the leading producers in the global cement industry are at least six years behind where they should be in terms of decarbonisation, and much of the industry is decades behind. A global framework for reporting and a global Carbon Border Adjustment Mechanism-like framework are coming, said Amr. Cement plant process optimisation using traditional levers is a necessary prerequisite for any decarbonisation programme.

**Nicolas David** and **Ralph Viebrock**, Dalog, argued that their products could 'defy downtime.' CEO David revealed that the company monitors over 500 machines in more than 60 countries in the cement sector. Viebrock then worked through the Internet of Things (IoT) maturity model relating Dalog's applications to the stages such as monitoring open girth gear performance,

8. Left to right: Nicolas David (Dalog), Arnaud Debus (Graco) and Ralph Viebrock (Dalog), on the Dalog stand.

9. A large and impressive shared stand.





mechanical kiln monitoring or using its DAWi wireless products to measure three-axis vibrations and temperatures in hard-to-get-to locations such as a kiln ID fan. Viebrock was keen to point out that his company focuses on value-oriented project loops rather than full automation. However, Dalog is using machine learning software for trend monitoring to further reduce unexpected shutdowns for its clients. He then used a case study to show how Dalog had saved Votorantim Cimentos North America over US\$3m in maintenance costs across its four integrated and one grinding cement plant in North America. Viebrock asserted that any cement plant could save up to Euro2m by working with Dalog and reducing maintenance, spare parts, downtime and production costs.

**Hakan Benzer**, co-founder of Minerva Engineering, gave a presentation on grinding with the Pamir horizontal stirred bead mill. The mill is around one quarter of the size of an equivalent-capacity ball mill, but has a power intensity 10 times higher: a ball mill may have 96,000 balls of 20mm diameter, but the bead mill may have more than one billion 1mm ceramic or steel beads. In the mill, a horizontal shaft with high tip-speed stirrers is used to impart an intense stirring effect, leading to high outputs from the relatively small mills. The mills can be used for raw meal, clinker, ash, GBFS, petcoke, coal and other materials, grinding to 8000-10,000 Blaine. The mill prefers a fine input feed, and so it works well as a secondary grinding mill, also being well-suited to separate grinding of components for cement blends. The mill has been demonstrated at Bursa Cement in Türkiye.

**Sultan Al-Harthi**, United Cement Industrial Company presented a case study on how his company's plant at Makkah in Saudi Arabia coped with a girth gear failure in February 2021. The site uses two ball mills to grind cement coupled with a

side drive, comprising a girth gear and a gearbox. A temporary fix was implemented within 18 days bringing operation back to 80% of normal levels. The cause was found to be that the mill shell and the girth gear had started to touch in certain hot conditions due to thermal expansion, leading to an eventual failure. A permanent solution was implemented in November 2021 by machining the mill flange, installing a new girth gear and making adjustments. The mill returned to normal production in January 2022. The company has since taken proactive action to stop the same issue occurring on its other mills.

**Dirk Lechtenberg**, MVW Lechtenberg, pointed out that the cement industry's alternative fuels supply is threatened by increasing competition for recycled plastics for chemical recycling and processing into synthetic oil, while the waste-to-energy industry has significant purchasing power for RDF. Further competition will be brought to bear since the EU is resolutely pivoting away from the use of fossil fuels, 'well ahead of 2050.' Biomass is becoming an increasingly important component of AF, since it is considered climate-neutral.

**Bo Bentsen** of FLSmidth gave an outline of his company's approach to fuel substitution, using the Hotdisc reactor, the Jetflex kiln burner, the Fuel-Flex pyrolyser, and Pfister fuel feeding and dosing options. The Hotdisc reactor can be used for bulky waste and biomass, from 1.2m-diameter truck tyres, down to sludge and grains. Bo stated that increased temperature in the combustion chamber does not reduce the time required for complete combustion, and instead particle size and available O<sub>2</sub> concentration have a strong influence on the time required to completely burn alternative fuels. The Hotdisc reactor allows ideal conditions for AF use, and calciner thermal substitution rates of 50-80% have been recorded. If required, the ash can be collected

10. Discussions on the Loesche stand.

11. The exhibition was well attended by delegations from around the world.





**12.** United Cement Industries' Sultan Al-Harthi provided a detailed girth gear repair case-study.



**13.** Karsten Brink Floor of ABB spoke about his company's new kiln inlet gas analysis system.

separately, so that the Hotdisc can be used in white cement production. The FuelFlex pyrolyser lowers NO<sub>x</sub> from combustion of AF, and can be 'bolted on' as a retrofit solution, with a return on investment of 'typically 1-2 years.'

**Karsten Brink Floor** of ABB spoke about a new kiln inlet gas analysis system, utilising a double air blaster. Karsten said that the probe is typically the coldest spot in the kiln, since it is generally water-cooled, and this results in heavy scaling along the probe that can reduce performance or even render the probe unusable. Long sample pipes meanwhile allow volatiles to condense inside the tube, and mechanical 'plunger' probes can jam. The new 4th generation 'ProKiln' sampler uses a central air blaster channel to clean the tip of the probe, and a peripheral air-blaster channel to keep a cartridge filter clean. A probe working at Drake Cement in the US has been working continuously for two years with very light maintenance.

**14.** Robert McCaffrey (left) and David Perilli (right) on the Global Cement stand.



**Martin Reformat** of Loesche pointed out that ash and slag supplies have regional, economic and seasonal limitations and will probably drop in use in the coming years. On the other hand, clays are widespread and have huge potential. Loesche is promoting the C/Clay clay calcination and grinding solution (in partnership with Dynamis from Brazil), and also offers E/Slag for ultra-fine grinding and enhanced performance for slag. Loesche offers its suite of solutions for AF under the banner of A/Fuels, and is forging into hydrogen technology under the H<sub>2</sub>/Burner flag. S/Crete selective concrete grinding is a potential source of cementitious material, aggregates and sand-size particles. There is, after all, around 3Bnt of concrete waste each year. 84% of concrete in China is landfilled, without any effort towards recycling. In Germany, the majority of concrete is 'recycled,' but in effect it is largely down-cycled into lower-value applications. Sand is the hardest component in concrete, harder in turn than aggregate which is harder than the relatively-soft solidified cement paste. Loesche's vertical roller mill, it turns out, is well-suited for concrete grinding: the finest fraction is composed largely of cement paste and this can be used as an SCM (depending on its reactivity) or used as a pre-decarbonated raw material substitute at up to 50%.

On the third day of the conference, **Felix Heinicke** of Maschinenfabrik Köppern spoke about edge effects in high pressure grinding rolls (HPGR). Rolls are very effective at coarse grinding, or pregrinding. However, there is a tendency for the feed to be coarser at the edges of the rolls due to segregation on feeder belts. Coarser feed results in coarser product, and the uneven split increases skewing and under-performance. There is more material in the middle of the rollers, resulting in higher grinding pressure and finer grinding. A larger grinding gap may allow a higher throughput, but also leads to lower grinding forces and coarser grinding. Hexadur hard-facing of the rollers provides strong grip on the materials, while studded tungsten carbide rollers help to form an autogenous grinding layer on the rollers reducing wear. At the same time, wear-resistant 'cheek plates' can be retrofitted to avoid material bypass at the end of the rollers.

## Conclusion

Delegates agreed that this was one of the best AUCBM events in recent years, with an optimistic atmosphere and plenty of business being done, despite the testing geopolitical situation. *Global Cement* looks forward to the next edition, wherever and whenever it may be.







CONFERENCE  
EXHIBITION  
AWARDS 2024

[globalslag.com](https://globalslag.com)

#globalslag

***Slag for profit***

Improving slag performance  
New applications for slag  
Global slag markets and trading

Organised by:

**global**  
**cement**  
MAGAZINE

Global Slag Enquiries

Exhibition and sponsorship:  
[paul.brown@propubs.com](mailto:paul.brown@propubs.com)

Programme and speakers:  
[robert.mccaffrey@propubs.com](mailto:robert.mccaffrey@propubs.com)

# SLAG

Including TWO  
field trips





# WHAT'S IN A NUMBER?

In our case it's trust. Because Global Cement Magazine is independently verified by ABC, our advertisers know they're getting the exposure they've been promised.

See it. Believe it. Trust it.

To advertise call Paul Brown on +44 776 7475 998 or [paul.brown@propubs.com](mailto:paul.brown@propubs.com)





These pages give *Global Cement's* monthly review of global cement prices - in US\$ for easy comparison. Some price information is only available to subscribers to *Global Cement Magazine*. Subscribe on Page 72. Subscriber prices in this issue come from Nigeria, Kazakhstan, India and Trinidad & Tobago. Prices are for metric tonnes unless otherwise stated. US\$ conversions from local currencies are correct at the time of publication.

**China:** The average price of cement across China was US\$45.50/t on 4 February 2024. This represented a month-on-month fall of 3.5% from US\$47.51/t on 4 January 2024. The decline in prices came before the start of China's Lunar New Year holidays, when construction work is almost entirely halted.

**Egypt:** Ex-works cement prices as at 4 February 2024 from [www.cementegypt.com](http://www.cementegypt.com): Ordinary Portland cement cost between US\$65.38/t (Assiut Cement) and US\$74.12/t (El Sewedy Cement). White cement cost between US\$111.68/t (Sinai Cement) and US\$116.54/t (Sinai White Cement). Blended cement prices were between US\$43.69/t (Assiut Cement) and US\$46.28/t (National Company for Cement in Beni Suef). Sulphate-resistant cement cost between US\$69.58/t (National Cement Company in Beni Suef) and US\$76.70/t (El Sewedy Cement).

**Saudi Arabia:** Average cement prices rose by 1.1% year-on-year to US\$3.71/bag (50kg) in the fourth quarter of 2023. Average ready-mix concrete prices fell by 5.5% to US\$52.16/m<sup>3</sup>.

**EU ETS:** The price of a permit to emit one tonne of CO<sub>2</sub> under the EU Emissions Trading Scheme (ETS) has continued its recent slide so far in 2024, falling to Euro64.54 on 4 February 2024. While this level represented a 0.9% week-on-week rise from Euro63.93/t on 28 January 2024, it was a 17.5% month-on-month

fall from Euro78.20/t on 4 January 2024 and a 33.3% year-on-year fall from Euro96.63/t on 4 February 2023.

**Pakistan:** Average cement prices from [priceindex.pk](http://priceindex.pk) as at 5 February 2024: DG Khan Cement = US\$4.47-4.52/bag (50kg); Lucky Cement = US\$4.42-4.45/bag; Maple Leaf Cement = US\$4.49-4.54/bag; Bestway Cement = US\$4.45-4.49/bag; Fauji Cement = US\$4.47-4.49/bag; Kohat Cement = US\$4.43-4.45/bag; Attock Cement, Pakcem, Askari Cement, Pioneer Cement, Flying Cement and Power Cement = US\$4.45-4.47/bag; Cherat Cement = US\$4.43-4.45/bag.

The Pakistan Bureau of Statistics stated that the average retail price of cement in the north of Pakistan was US\$4.43/bag in the week ending 25 January 2024, a 0.4% decrease week-on-week. Prices in the south of Pakistan were US\$4.11/bag the same week, level from seven days prior. Variations were observed in different cities, with Islamabad recording US\$4.26/bag, Rawalpindi US\$4.26/bag, Gujranwala US\$4.51/bag, Lahore US\$4.58/bag and Karachi US\$4.19/bag.

**Ghana:** The Chamber of Cement Manufacturers has reached an agreement with the Ministry of Trade and Industry (MTI) to publish recommended wholesale and retail prices for cement. The move comes in response to concerns about growing cement prices in the retail sector, which have led to a range of negative economic impacts. A statement from the MTI said that the parties had agreed to hold consultations with industry players, particularly before individual companies announce ex-factory price rises.



## FREE SUBSCRIPTION?

Regular cement price contributors receive a free print subscription to *Global Cement Magazine*!

**Contact:** [peter.edwards@propubs.com](mailto:peter.edwards@propubs.com)

Contributors' names are not published.





Subscribe to ...

**global  
cement  
MAGAZINE**

...the world's most widely-read  
cement magazine



Subscribers to *Global Cement Magazine* receive:

- Priority-mailed print copy every issue (11 copies per year);
- High-resolution printable PDF download straight to your inbox;
- Extra cement prices;
- 33% discount on *Global Cement Directory 2024*.



**Subscribe via: [www.globalcement.com/magazine/subscribe](http://www.globalcement.com/magazine/subscribe)**



1 year (11 issues) = £110

2 years (22 issues) = £195

3 years (33 issues) = £275

Independent Analysis • Industry Trends • Global Cement News  
National & Regional Reports • Interviews • Technology





## What is life?

**Robert McCaffrey** Editorial Director, *Global Cement Magazine* ([rob@propubs.com](mailto:rob@propubs.com))



**H**ave you ever found yourself sitting out under the stars, gazing up and wondering 'What is life??' Well, Paul Nurse, a Nobel Prize winner, has thought about it pretty deeply, and has written a book called just that. I thought it might be useful to report back on his conclusions.

Paul Nurse started as a 'lowly' lab assistant, who was encouraged by his brewery employers to do some research into yeast. It turns out that Nurse had a talent for research, but not the qualifications he needed to get into university, despite taking the exam six times. Finally he was ushered into Birmingham University 'by the back door,' and went on to make several fundamental discoveries about how life is organised - and how it organises itself. By looking at cell biochemistry and cell division in yeast, he was able to elucidate the basic mechanics of life.

He starts off by saying that 'life is chemistry.' On Earth, life is always based on cells - the membrane-bounded 'smallest particle of life.' Each cell is a microscopic chemical factory, which enacts multiple chemical reactions many times per second.

He points out that cells make the energy that they need for their chemical reactions through a process called cellular respiration. This takes place in tiny reactors called mitochondria that occur within each cell (sometimes one to a cell, sometimes many thousands, such as in heart muscles), an arrangement which may have evolved after one early cell 'swallowed' another (about 1.5 billion years ago) and both found benefits. Cellular respiration is the process in the mitochondria whereby sugars (derived from the sugars, fats and proteins that our bodies eat) react with oxygen to create water and carbon dioxide, releasing energy.

The exact mechanism, as related by Nurse, is quite extraordinary. Each mitochondrion has a double membrane surrounding it. Protons, single atoms of hydrogen that have been stripped of an electron, are pushed out of the centre of the mitochondrion into the gap between the two membranes. They then physically rush back into the centre of the reactor through channels made of protein, pushing past tiny molecular turbines, which capture the energy of the rushing protons and transform it into high-energy chemical bonds in the form of adenosine triphosphate, or ATP, which is the universal molecule of life. Practically all of the food that you eat is processed in your mitochondria, and this is a process that occurs so frequently (around

150 times per second) in each of your body's 30-trillion or so cells, that your body's cells produce your body-weight in ATP every day. ATP is used in turn by the cell to power its myriad chemical reactions, being broken down and having to be recreated in the next round of synthesis.


Whether a cell is powered by cellular respiration, by photosynthesis (plants), or chemosynthesis (hydrothermal-vent dwellers), whether it is a single-celled life-form (a bacterium, for example) or one with 100 quadrillion cells (a blue whale), all of these cells rely on chemical reactions to sustain themselves. Cells working together form multicellular organisms, such as ourselves.

It seems that the prime directive of all life boils down to two things - finding nutrition to power the mitochondria and ensuring reproduction - 'food and sex.' Cement and concrete use are higher-level behaviours that enable us to do everything else. Nurse also points out several other factors that are common to all life on Earth:

1. The ability to evolve through natural selection;
2. Being a bounded, physical entity, separated from but in communication with its environment;
3. Life is composed of chemically-driven, physically-active and information-based organisms that construct their own metabolism and use it to maintain themselves, to grow and to reproduce.

Paul Nurse states that the similarity of ATP-reliant chemistry in cells on Earth - being the same in a yeast cell as in a human and a whale - suggests that life evolved just once on the planet, over 3.5 billion years ago - before the earliest fossils of unarguably 'alive' cyanobacterial colonies.

However, Paul Nurse also goes further: he suggests that the information-dense and ultra-stable DNA molecule, which allows the passing-on of information from cell to cell and from generation to generation, and which allows cells to synthesise numerous life-critical chemicals using RNA and ribosomes (macromolecular biological machines that perform protein synthesis) - may be a general pattern that is followed by organisms throughout the universe.

So, when staring up at the stars, wondering what life is, you might be startled by the thought that something up there - based on the same or similar chemistry - might be looking at us through interstellar space, wondering the same thing: 'What is life?' 



## global cement<sup>TM</sup> MAGAZINE

### Advertising enquiries:

Paul Brown:

+44 (0) 7767 475 998  
paul.brown@propubs.com

### Editorial enquiries:

Peter Edwards:

peter.edwards@propubs.com

Beumer Group	13	verena.breuer@beumer-group.com • www.beumer.com
CemAI	5	info@cemAI.com • www.cemAI.com
Coal Mill Safety Pte Ltd	42	info@coalmillsafety.com • www.coalmillsafety.com
CTP Team	63	sales@ctp.mi.it • www.ctp.mi.it
DALOG Diagnosesysteme GmbH	IFC, 3	info@dalog.net • www.dalog.net
Di Matteo Group	21	info@dimatteo.de • www.dimatteo.de
Fuchs Lubricants Germany GmbH	27	klaus.holz@fuchs.com • www.fuchs.com
Global CemCCUS Conference 2024, Oslo, Norway	51	rob@propubs.com • www.cemCCUS.com
Global Cement Magazine - Audit Bureau of Circulation	70	www.abc.org.uk/product/9212
Global CemFuels Conference 2024, Dublin, Ireland	37	rob@propubs.com • www.cemfuels.com
Global Slag Conference 2024, Dubai, UAE	69	rob@propubs.com • www.globalslag.com
HARDTOP Gießereitechnologie GmbH	41	info@hardtop-gmbh.de • www.hardtop-gmbh.de
HEKO Ketten GmbH	25	info@heko.com • www.heko.com
Hillhead Quarrying & Recycling Show 2024	47	hillhead@qmj.co.uk • www.hillhead.com
IEEE-IAS/PCA Cement Industry Technical Conference 2024	49	www.cementconference.org
Intercem Engineering GmbH	39	info@intercem.de • www.intercem.de
John King Chains Ltd	IBC	sales@johnkingchains.co.uk • www.johnkingchains.com
KettenWulf	29	service@kettenwulf.com • www.kettenwulf.com
KIMA Process Control GmbH	FC	schmidt@kima-process.de • www.kima-process.de
Maerz Ofenbau AG	9	careen.muller@maerz.com • www.maerz.com
Martin Engineering	17	info@martin-eng.com • www.martin-eng.com
ScrapeTec Trading GmbH	33	jurca@cuatro.de • www.scrapetec-trading.com
SICIT Group	31	adayem@sicitgroup.com • www.sicitgroup.com
Ventilatorenfabrik Oelde GmbH	23	info@venti-oelde.com • www.venti-oelde.com
9th International VDZ Congress, Düsseldorf, Germany	45	info@vdz-congress.org • www.vdz-congress.org
Wilhelm Knepper GmbH & Co. KG	43	v.seiger@knepper-recycling.de • www.knepper-recycling.de
XDH-energy	45	xavier.dhubert@xdh-energy.com

### Next issue: April 2024

**Feature:** Slag in 2024  
**Interviews:** PCA, US  
**Country Reports:** US; UAE  
**Distribution:** IEEE-IAS/PCA Cement Conference, Denver, US;  
 Global Slag Conference, Dubai, UAE

### Advertising deadline: 14 March 2024

**Technical:** Slag, Environmental Protection, Alternative Fuels,  
 Shredding, Kiln Services, Grinding, Gears, Welding  
**Interview:** Condition Monitoring, DALOG Diagnosesysteme  
**Concrete:** Cool Corporation, Neustark





**JOHN KING**

Conveyor Chains & Sprockets Worldwide

# John King MillMaster

For High duty elevators, designed for service dependability, capacity and economy.

## Key engineering design, manufacturing and maintenance features

### 1. SINGLE SOURCE

Full Design, manufacturing and installation service

### 2. REDUCED CAPITAL COSTS

As compared to alternative systems

### 3. LOWER POWER CONSUMPTION

Centrifugal discharge for reduced absorbed power

### 4. LOW COST OF MAINTENANCE

High duty JKB "Newgen" steel bush chain for optimum performance

### 5. KING MILL GRADE SPROCKETS

Split segmental construction with hardened tooth form

### 6. HIGH DUTY SPHERICAL ROLLER BEARINGS

Within cast steel plummer blocks with full and effective sealing

### 7. STANDARD HIGH CAPACITY ELEVATOR BUCKETS

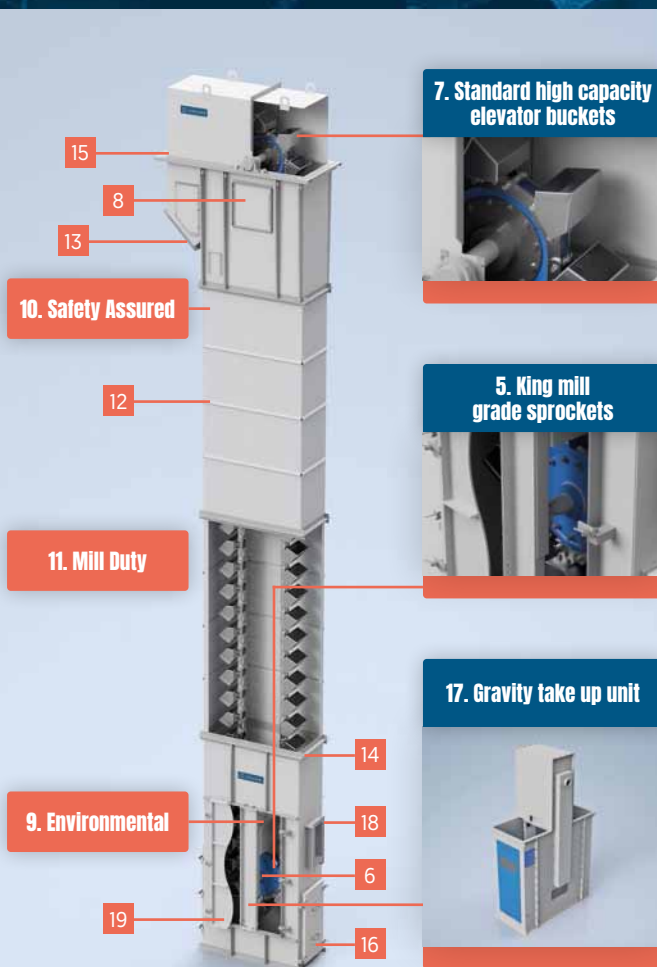
Unique "wrap round" high capacity design

### 8. EASY MAINTENANCE

Designed with access and future maintenance advantage in mind

### 9. ENVIRONMENTALLY FRIENDLY

Fully sealed with internal gravity take up tensioning system



### 10. HEALTH AND SAFETY COMPLIANT

Safety assured construction

### 11. VERSATILITY

Best option considering plant layout

### 12. MILL DUTY CONSTRUCTION

With reinforcing angles to maximise structural strength

### 13. ADJUSTABLE DISCHARGE CHUTE

For maximised product delivery

### 14. SELF-SUPPORTING DESIGN

Reduced costly and access restricting steel work

### 15. HINGED HEAD UNIT

For full, fast and efficient maintenance

### 16. FULL HEIGHT DOUBLE HINGED ACCESS DOORS

For optimal service access

### 17. INTERNAL GRAVITY TAKE UP TENSIONING

The unrivalled design

### 18. FLANGED INLET OPENING FOR EASY CONNECTION TO DELIVERY SHOOT

Position to be engineered for material delivery

### 19. SHROUDED BOOT SECTION

For clearing of spill and carry over

### 20. NEW - UNIQUE COMBINATION OF FEATURES

Better by design



#### John King Chains Limited

New Climax Works, Lancaster Business Park,  
Sherburn-in-Elmet, LS25 6NS, UK

Email: sales@johnkingchains.co.uk

Phone: +44 1977 681 910



#### John King Chains Central Europe Sp. z o.o.

ul. Puchacza 5, 89-100 Bielawy, Poland

Email: aw@johnkingchains.com

Phone: +48 600 871 077



#### John King Chains USA Inc.

1910 Woodlands Industrial Dr,  
Birmingham, AL 35210, USA

Email: sales@johnkingusa.com

Phone: +1 205 593 4279



#### John King Chains South Africa (Pty) Ltd.

5 Charlie Lane, Boksburg, South Africa

Email: sales@jkc.co.za

Phone: +27 11 894 3570



#### Cadenas John King Ltda.

Anibal Pinto 1249, Concepcion, Chile

Email: manuel@johnkingchains.com

Phone: +56 2 41 221 4948



#### SITE SERVICE INSTALLATION & MAINTENANCE

For more info ask our team member

AVAILABLE 365 DAYS/YEAR



www.johnkingchains.com



We pioneer motion

## We support you! Condition Monitoring Services

Can you hear an unusual noise coming from your gearbox? Are you just not sure which condition monitoring solution is best for your application or are you having difficulties configuring your systems? Our service team supports you with all your concerns.



Be it remote machine diagnostics, endoscopy, root cause analysis in case of machine problems, measurements directly on the system or the installation and configuration of measuring systems, we have been offering the service that our customers worldwide appreciate for decades.

[medias.schaeffler.de/en/maintenance-services](https://medias.schaeffler.de/en/maintenance-services)

**SCHAEFFLER**