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**APRIL 2021**



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# HARDTOP INVESTS IN THE FUTURE





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**On the cover...** Over more than 20 years HARDTOP has established itself as a competent and reliable partner for new and spare cast parts, but has reached the limits of its capacity. To overcome this, the company is investing in two projects, in Poland and in China.

A production workshop and storage facility spanning an area of 1840m<sup>2</sup> is being built at the Miechów-Charsznica site (Poland). After its completion, the production capacity will be increased from the current 1000t/yr of castings to 3000t/yr of castings.

A second HARDTOP joint venture was founded in China at the Zibo City location in Shandong Province (China). Mainly bimetallic hammers are manufactured here. Its capacity today is 1400t/yr of bimetal castings, which is to be expanded to 4000t/yr.

With the two projects, HARDTOP has laid the foundation for positive future development.



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*Dear readers,*

Welcome to the April 2021 issue of *Global Cement Magazine* - the world's most widely-read cement magazine - several pages of which offer insight into the ongoing development of the hydrogen economy. By using renewable energy to electrolyse water (H<sub>2</sub>O) into hydrogen (H<sub>2</sub>) and oxygen (O<sub>2</sub>), we can convert the electrical energy supplied by wind, solar, hydroelectric and other renewable sources into chemical energy. Hydrogen can be burned directly in a cement kiln, a technique Cemex will expand across its global operations during 2021 (Page 48). There are also chemical routes from hydrogen to hydrocarbons that can be converted into stable fuels and even fossil-fuel-free plastics. This approach is currently being developed by LafargeHolcim as part of the C2PAT consortium, along with renewable energy and plastics producers. LafargeHolcim's contribution? Exhaust CO<sub>2</sub> from its Mannersdorf plant in Austria, the other main ingredient in the synthetic fuel / plastic manufacturing process (Page 42). The consortium anticipates the capture and utilisation of 100% of the plant's CO<sub>2</sub> emissions by 2030. Elsewhere, Hanson's Padeswood plant will contribute 0.8Mt/yr of CO<sub>2</sub> emissions in another hydrogen-infused project, the HyNet North West consortium in the UK (Page 36), which aims to eliminate 10Mt/yr of CO<sub>2</sub> emissions in total via CO<sub>2</sub> capture and utilisation/storage (CCU/S). The company's Port Talbot slag grinding plant is already using renewably-generated hydrogen as a fuel.

While these developments are very exciting, there are structural obstacles to the development of the hydrogen and CO<sub>2</sub> economy. Cement plants are not always in sunny or windy places, so the development of new national and international pipeline infrastructures for CO<sub>2</sub> and hydrogen is a must. Both LafargeHolcim and PCA President Mike Ireland (Page 50) point out that this is beyond the scope of individual industrial plants and even large consortia like HyNnet. Both call for governments to step up now to develop pipeline systems for the future. Then the use of hydrogen can truly take off!

Enjoy the issue!

*P Edwards*

Peter Edwards  
Editor



Cement  
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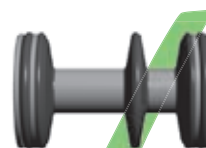
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Videos about MAC  
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# Enhance your pulse !



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- **Fill-Level** structure born sound
- **Torque** magnetic
- **Vibration** velocity



Peter Edwards, Global Cement Magazine

## Global cement upgrade update

Selected recent, ongoing and forthcoming projects from the global cement sector.

1



**Company:** CalPortland (Taiheiyo Cement)  
**Plant:** Mojave, California, US  
**Project:** New raw mill  
**Supplier:** FLSmidth  
**Contractor:** Phoenix Industrial  
**Completion:** December 2021

Delayed between April 2020 and January 2021 due to Covid-19 restrictions.

2



**Company:** Lehigh Cement (HeidelbergCement)  
**Plant:** Mitchell, Indiana, US  
**Project:** New 0.8Mt/yr production line  
**Cost:** US\$600m  
**Started:** October 2019  
**Completion:** Q4 2023

3



**Company:** National Cement (Vicat)  
**Plant:** Ragland, Alabama, US  
**Project:** New 5000t/day production line  
**Completion:** January 2021

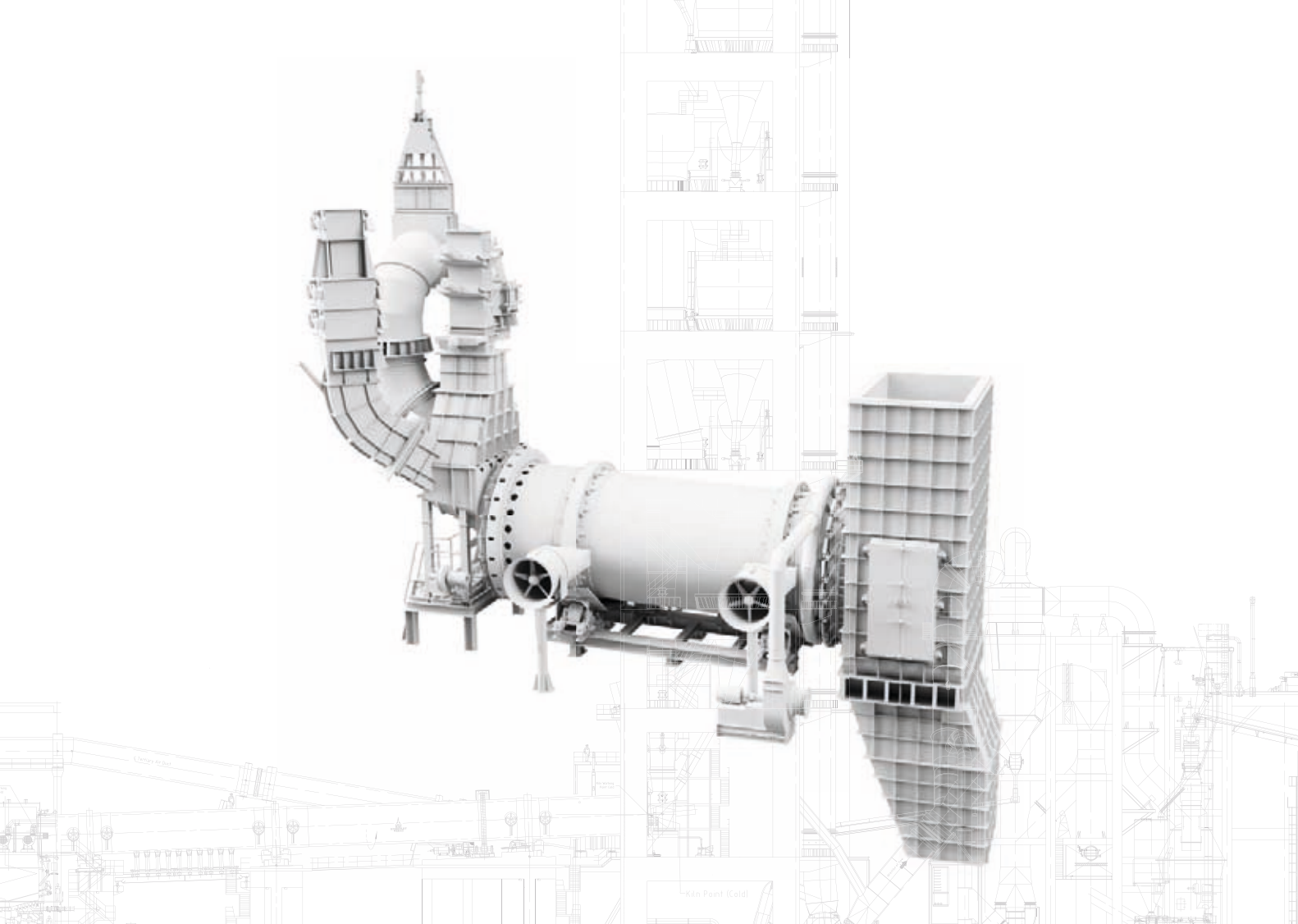
4



**Company:** Loma Negra (Inter cement)  
**Plant:** Olavarría, Buenos Aires, Argentina  
**Project:** Upgrade from 1.7Mt/yr to 2.4Mt/yr  
**Completion:** Delayed from early 2021 by pandemic







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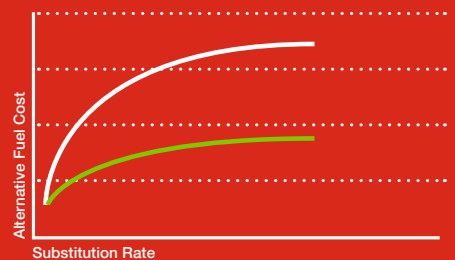
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1

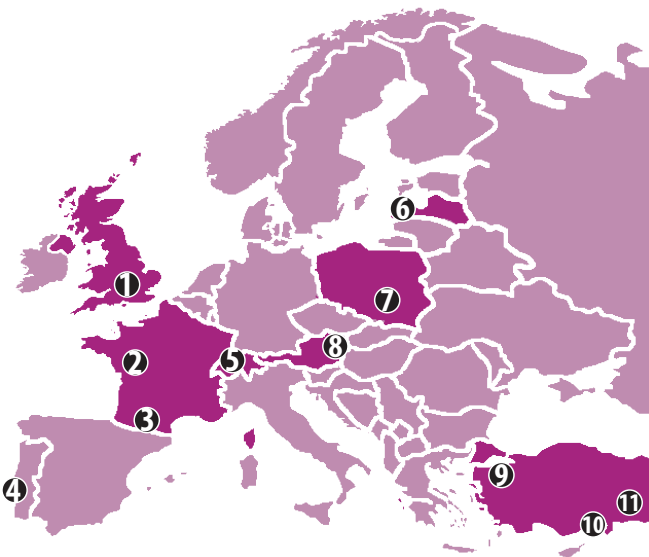


**Company:** Cemex UK  
**Plant:** Rugby, Warwickshire, UK  
**Project:** Two new plastic packing lines  
**Cost:** Euro5.6m  
**Began:** Early 2021  
**Completion:** June 2021

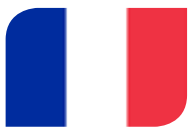
2



**Company:** Lafarge France  
**Plant:** Martres-Tolosane, France  
**Project:** New kiln line to increase alternative fuel use from 30% to 80%  
**Cost:** Euro120m  
**Completion:** Q3 2021



3



**Company:** Çiments Calcia (HeidelbergCement)  
**Plant:** Airvault, Deux-Sèvres, France  
**Project:** New line to replace two older lines  
**Cost:** Euro300m  
**Status:** Planning

4



**Company:** SECIL  
**Plant:** Oûtão, Portugal  
**Project:** 29MW waste heat recovery system  
**Supplier:** CTP-Team  
**Completion:** H2 2022

*Read more about this project on Page 16.*

5



**Company:** Jura Cement Fabriken (CRH)  
**Plant:** Wildegg, Aargau, Switzerland  
**Project:** Regenerative thermal oxidation (RTO) system  
**Supplier:** Dürr

*Read about Swiss cement on Page 38.*

6



**Company:** Schwenk Latvija  
**Plant:** Brocēni, Latvia  
**Projects:** New 170t/hr cement mill  
 Construction of 12,500t silo  
**Cost:** Euro33m  
**Status:** Ongoing

7



**Company:** Lafarge Poland  
**Plant:** Małogoszcz, Jędrzejów, Poland  
**Project:** New kiln line  
**Supplier:** Nanjing Kisen  
**Cost:** >Euro100m  
**Began:** October 2020  
**Completion:** Q1 2023

Project includes 307t/hr MVR 3750 R-4 vertical roller mill from Gebr. Pfeiffer.

8



**Company:** Lafarge Zement  
**Plant:** Mannsrdorf, Austria  
**Project:** New conveying system for raw materials and alternative fuel.  
 Includes two pipe conveyors, one 192m long with capacity 22t/hr, one 87m long with capacity 10t/hr.

**Supplier:** Beumer Group  
**Completion:** Mid-April 2021

*Read more about this plant on Page 42.*

9



**Company:** Bursa Çimento  
**Plant:** Bursa, Turkey  
**Project:** New clinker line  
**Supplier:** FLSmidth  
**Completion:** Q4 2022

10



**Company:** Mersin Çimento  
**Plant:** Mersin, Turkey  
**Project:** Cyclone replacement  
**Supplier:** DAL Teknik Makina  
**Announced:** September 2020

11



**Company:** Çimko Çimento  
**Plant:** Adıyaman, Turkey  
**Project:** Grey to white line conversion.  
 Includes DuoFlex burner, rotary cooler and OK raw mill.  
**Supplier:** FLSmidth  
**Completion:** Q1 2022



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1



**Company:** Ciments du Sahel  
**Plant:** Kirène  
**Project:** 3Mt/yr production line  
**Supplier:** Sinoma International  
**Completion:** 2023

Includes 23 bucket elevators, seven pan conveyors, 11 drag chain conveyors, two Samson material feeders, four Centrex silo discharge machines and 19 silo discharge gates from Aumund Group.

5



**Company:** Lucky Cement  
**Plant:** Samawah, Iraq  
**Project:** New 1.5Mt/yr plant  
**Completed:** February 2021

2



**Company:** BUA Cement  
**Plant:** Kalambiana, Sokoto State, Nigeria  
**Project:** New 1.5Mt/yr production line  
**Completion:** July 2021

3



**Company:** Lafarge Africa  
**Plant:** Papalanto, Ewekoro, Nigeria  
**Project:** Upgrade to electrostatic precipitator on bagging plant  
**Cost:** US\$8m  
**Completion:** Q4 2021

4



**Company:** Dangote Cement  
**Plant:** Douala, Cameroon  
**Project:** Double capacity to 3Mt/yr  
**Announced:** February 2021

6



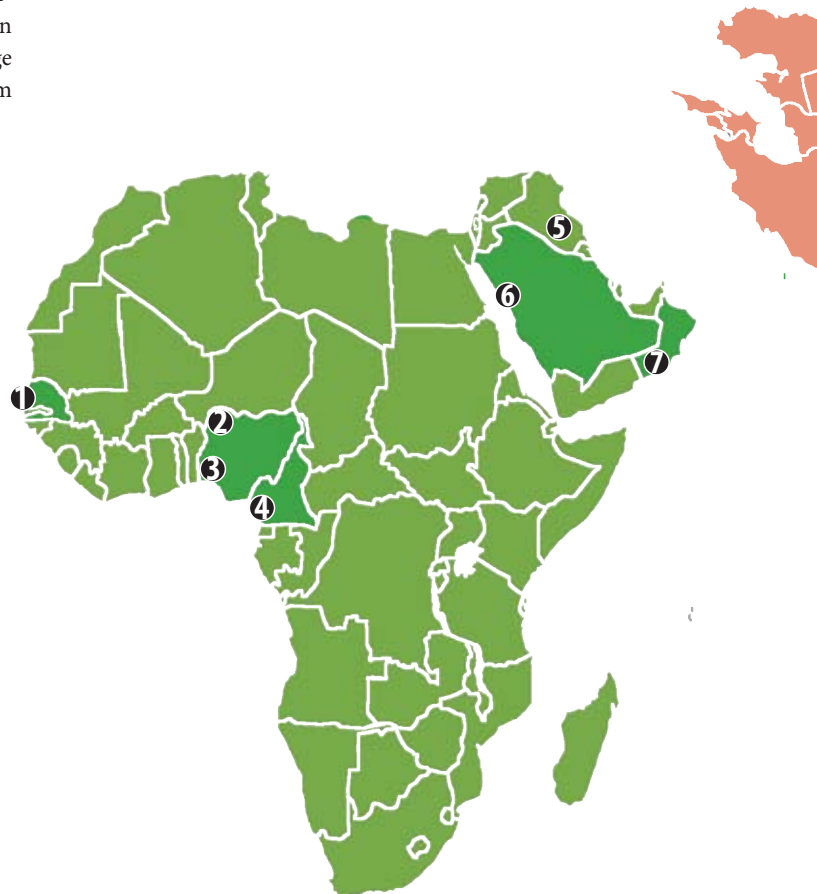
**Company:** Yanbu Cement  
**Plant:** Yanbu, Saudi Arabia  
**Project:** Modernisation to Line 4  
**Timeline:** February - April 2021

7



**Company:** Raysut Cement  
**Plant:** Salalah, Oman  
**Project:** 9MW waste heat recovery plant  
**Supplier:** Sinoma International  
**Began:** January 2021

Project will decrease CO<sub>2</sub> emissions by 25-30% and water consumption by 50%.







1



**Company:** Aravan Cement  
**Plant:** Aravan, Osh, Kyrgyzstan  
**Project:** 1.5Mt/yr capacity increase  
**Status:** In discussion

6



**Company:** Shree Cement  
**Plant:** Raipur, Chhattisgarh, India  
**Project:** New 10,500t/day kiln line

Includes MVR 6000 R-6 vertical roller mill for raw meal and MPS 2800 NK coal mill from Gebr. Pfeiffer. Includes waste heat recovery (WHR) system from ISGEC Heavy Engineering.

7



**Company:** JSW Cement  
**Plant:** Jayanthipuram, Andhra Pradesh  
**Project:** Waste heat recovery system  
**Completion:** Q3 2021

8



**Company:** JSW Cement  
**Plant:** Kurnool, Andhra Pradesh  
**Project:** New 2.3Mt/yr line  
**Completion:** Q3 2021

9



**Company:** Dalmia Cement  
**Plant:** West Bengal, India  
**Project:** New 1.7Mt/yr line  
**Cost:** US\$50m

10



**Company:** SungShin Cement  
**Plant:** Two plants, South Korea  
**Project:** 2 HotDisks  
**Supplier:** FLSmidth  
**Completion:** Q3/Q4 2021

11



**Company:** Cemex Philippines  
**Plant:** Antipolo, Philippines  
**Project:** New 1.5Mt/yr kiln line  
**Cost:** US\$235m  
**Supplier:** CBMI Construction  
**Status:** Ongoing

12



**Company:** Taiheiyo Cement  
**Plant:** San Fernando, Cebu, Philippines  
**Project:** New 5.0Mt/yr kiln line  
**Cost:** US\$280m  
**Status:** Plans approved

2



**Company:** Lucky Cement  
**Plant:** Pezu, KPK, Pakistan  
**Project:** 3.2Mt/yr capacity increase  
**Status:** Tender in progress  
**Completion:** 2023

3



**Company:** Tokyo Cement  
**Plant:** Trincomalee, Sri Lanka  
**Project:** 1Mt/yr capacity increase  
**Cost:** US\$12m

4

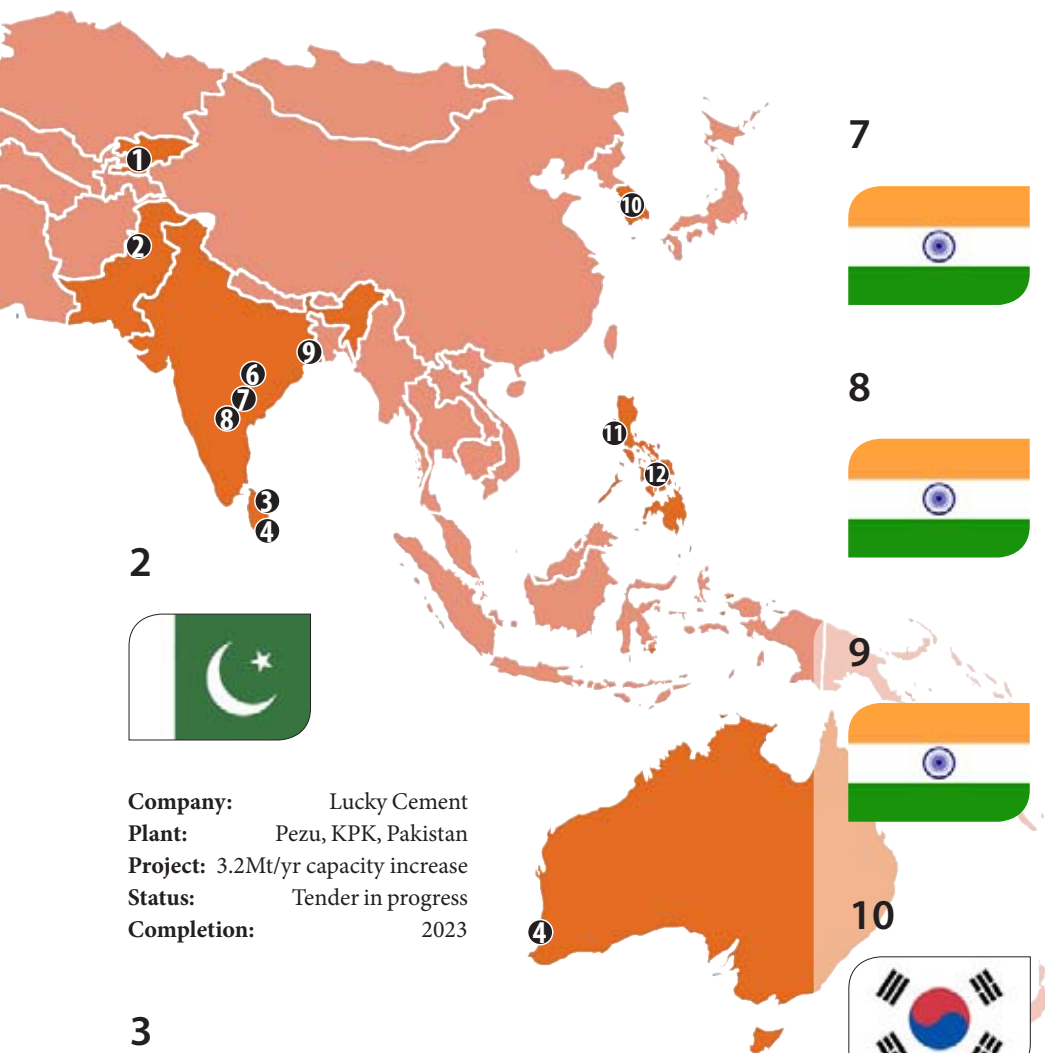


**Company:** Lanwa Sanstha Cement  
**Plant:** Hambantota, Sri Lanka  
**Project:** 2.4Mt/yr plant  
**Cost:** US\$70m  
**Commissioning:** June 2021

5



**Company:** Adbri  
**Plant:** Kwinana, Western Australia  
**Project:** Grinding plant upgrade from 1.1Mt/yr to 1.5Mt/yr  
**Cost:** US\$152m





CTP-Team Italy & Secil

## Waste heat recovery project for Secil Outão

CTP Team Italy is in the process of engineering, installing and commissioning a waste heat recovery (WHR) system based on Organic Rankine Cycle (ORC) technology for Secil's Outão plant in Portugal.

The Secil-Outão plant was established in 1904, in Setúbal, close to the Portuguese capital Lisbon. With production in excess of 2Mt/yr, it is one of the largest cement plants in Portugal. The characteristics of the valley in which the plant is located, with all of the raw materials required for production, as well as easy road, rail and sea access, including its own wharf, are all factors that have contributed to it becoming one of the most successful producers of cement in the country.

### WHR project

As part of its ongoing development, the Secil Outão plant regularly invests in the modernisation of its equipment, particularly when it comes to mitigating the inevitable environmental impacts of the cement manufacturing process. The company is currently implementing an R&D Clean Cement Line Project (CCL Project) at the Outão plant, with the aim of bringing the plant to the forefront of energy efficiency, with the lowest CO<sub>2</sub> emissions for any cement plant in Europe. It is partly funded by the Portugal 2020 government incentives program.

As part of the CCL Project, the company signed a contract with CTP Team, Italy, for the supply of a new waste heat recovery (WHR) system for the Outão plant in 2020. Under a turnkey EPC contract,


the project consists of several new developments to provide a highly customised solution to feed a double-loop system (thermal oil and organic), to recover waste heat and produce electricity from three different sources:

1. Pre-heater of the existing 4000t/day kiln line;
2. Clinker cooler of the same;
3. A new solar field that Secil will install close to the production line.

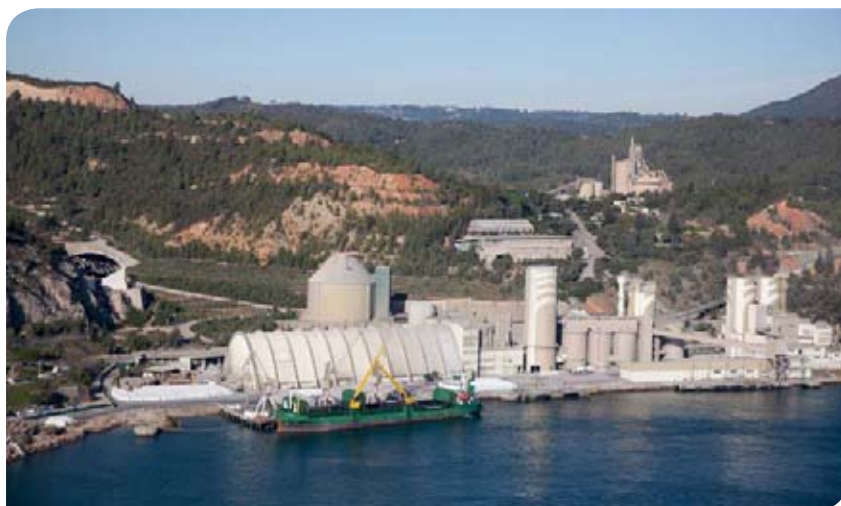
The new heat exchangers provided by CTP will recover up to 29MW of waste heat to feed a new Organic Rankine Cycle system that is equipped with a state-of-the-art 7.2MW axial turbine manufactured by Turboden. The system is expected to generate approximately 50 million kWh per year, more than 30% of the current plant's electricity needs. The system is currently in the final engineering stage, with construction to be carried out in 2021 and early 2022. The first electricity from the system will be generated in the second half of 2022.

### Environmental benefits

From an environment point of view, the new WHR system alone will drastically reduce the CO<sub>2</sub> footprint of the cement plant by a total of 14,000t/yr. In addition, the system provided by CTP is totally water free, without any need to treat residual water wastes from the process.

The WHR system is fully automatic and drastically reduces the need for operators to be physically present during daily operation. Thanks to this specific advantage of organic cycles and to the total absence of water treatments in the process, the operational expenditure is around 75% lower than that of an equivalent WHR system based on traditional Steam Rankine Cycle (SRC), with the added advantage that the plant can run autonomously, a major advantage in a Covid-restricted world. 

**Below:** The Secil Outão plant, which aims to have the lowest CO<sub>2</sub> emissions of any cement plant in Europe.







HARDTOP GmbH

## HARDTOP invests in the future: More castings for the cement industry

HARDTOP GmbH reports on two recent projects that have expanded its new and spare parts production capabilities in Europe and Asia.

In the cement production and mining sectors, there are usually very high requirements in terms of wear and heat resistance. This applies above all to wear-resistant cast parts for crushers and mills as well as heat-resistant cast parts for the kiln, cooler and heat exchanger. HARDTOP Gießereitechnologie GmbH traditionally produces and supplies new and spare parts for this, such as hammers for raw material crushers, hammer mills and clinker crushers as well as blow bars and linings for impact mills, drag chain links, grate bars, clinker cooler plates, impact plates, armoured roof and corner plates, bunker linings and impact plates, to name just a few.

Over more than 20 years HARDTOP has established itself as a competent and reliable partner for new and spare cast parts. This meant that the company had reached its capacity limits and an urgent capacity expansion was inevitable. As a result, investments were made in two projects.

### HARDTOP Centrum Odlewnictwa, Poland

HARDTOP Centrum Odlewnictwa, founded in 2006, is located in Miechów-Charsznica, approximately 45km north of Kraków in the south of Poland. Here, around 70 employees currently produce 1000t/yr of castings. The range of materials is extremely diverse and, in addition to the company's product speciality, HARDTOP® bimetallic cast, spans from heat-treated steel castings and heat-resistant, corrosion- and acid-resistant cast steel to wear-resistant castings.

In order to overcome the capacity limits, neighbouring properties of around 13,500m<sup>2</sup> were purchased. The expansion of the facility area now enabled the planning and construction of new production workshops and a storage hall comprising an area of 1840m<sup>2</sup>. After completion of the project, annual production capacity should be increased to 3000t/yr of castings, a tripling of its capacity.



**Left:** Outside HARDTOP Centrum Odlewnictwa site in Poland, seen after the addition of a second storey.



**Left:** The first construction phase for the new production workshops in Poland.



Castings weighing 1150kg are targeted as the largest single cast-piece weight. This will be made possible by installing a modern melting shop with two medium-frequency furnaces of 800kg each and a medium-frequency furnace with a capacity of 1t. These will supplement the four current melting furnaces.

An increase in the office-building size has already been realised as part of a planned first step. Further construction phases, including the construction of the workshop, are currently being worked on, along with the installation of the equipment. Among other things, modern sand processing and effective post-treatment of the castings are planned here. In the last construction phase, the mechanical processing of the cast parts is planned in-house in order to minimise dependence on processing companies. Of course, the introduction of new, modern technologies, such as metal matrix composites, is also on the agenda. The aim is to constantly react flexibly to customer needs and to provide customers with the best possible solutions for their casting challenges.

**Right:** In the shell of the new production workshop in China.



## **HARDTOP castings (Zibo), China**

The second HARDTOP joint venture in China is located in Zibo City in Shandong Province, approximately 450km south of Beijing. HARDTOP

**Right:** The managing directors after verification of the commissioning protocol.



**Far Right:** Castings emerge from the heat-treatment furnace.







**Above:** Semi-automatic casting for bi-metal hammers.

castings (Zibo) Co., Ltd. was founded in July 2019 and began production in December 2019. This became a reality thanks to the acquisition of an old, disused foundry with, by Chinese standards, a rather small plot of approximately 11,400m<sup>2</sup>. As a result, an additional production workshop of 750m<sup>2</sup> had to be built on the site, with the buildings renovated and equipment installed. Today around 50 employees produce 1400t/yr of castings at the site. In contrast to the Polish foundry, these are almost exclusively bimetallic hammers, as China, as the world's largest cement producer, has the greatest demand for them.

The heart of the process is the melting operation in which there are one 2t and two 1t medium-frequency furnaces. In the further expansion stage, this enables an annual capacity of up to 4000t/yr of bimetall casting. The capacities for heat treatment with two electric heat treatment furnaces are also being adapted to suit the plant's requirements.

### Summary

With this two-project extension in Poland and the new establishment in China, HARDTOP has laid the foundation for positive future development. Our customers, especially in the cement industry, can benefit from this in the future.



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Interview by Peter Edwards, Global Cement Magazine



## In discussion: Hans-Heinrich Reuter, TESTING Bluhm & Feuerherdt GmbH

*Global Cement* catches up with TESTING Bluhm & Feuerherdt's Managing Director Hans-Heinrich Reuter during a busy period for the company.

**Above:** Hans-Heinrich Reuter, Managing Director of TESTING Bluhm & Feuerherdt. Prior to joining the company, Reuter worked for a major civil contractor to deliver large concrete projects in Germany, Switzerland and Singapore. He joined TESTING Bluhm & Feuerherdt in 2013 as Junior Sales Manager. After being promoted to Sales Director National and International, he went on to become Managing Director in July 2019.

**Global Cement (GC):** Please could you outline the history of TESTING Bluhm & Feuerherdt?

**Hans-Heinrich Reuter (H-HR):** TESTING Bluhm & Feuerherdt was founded in West Berlin in 1978 by Sylvia Feuerherdt and Benno Bluhm. Sylvia's husband Jochim Feuerherdt was in charge of developing products, the first of which were air entrainment meters for fresh concrete. The company expanded its product range in the 1980s and then, upon the fall of the Berlin Wall in 1989, it was able to enter previously untapped markets, growing its presence significantly.

In 2014 the company completed a new premises, which enabled it to grow its production capacity and enter further additional markets. The company retains its presence in Berlin, where it employs around 50 people, across two production facilities. TESTING Bluhm & Feuerherdt is now also building additional production space, which includes an 11m-high 16t crane over a 8m x 11m area. This facility will come online in late 2021.

**GC:** What products does the company make?

**H-HR:** The company offers more than 4000 products that relate to the testing of building materials, predominantly for cement, concrete and mortars. Most are for physical testing, for example of fresh material properties and physical destruction / strength tests. A smaller range of products also looks at chemical properties of cement and concrete. Aside from our best known products - Blaine testing machines, Vicat machines and air entrainment meters - we produce an incredible range of accessories and parts. We also produce the TESTING Mobile Laboratory, which fits in a shipping container.

**GC:** Which companies use your products?

**H-HR:** There are four main categories: Precast and ready-mix concrete manufacturers that test their quality; Cement manufacturers that check mortar samples for physical strength; Companies developing chemicals for the construction industry, and; Researchers, both academics and additive manufacturers. Nearly 100% of our sales relate to cement, concrete and mortar testing, areas with near infinite opportunities for measurement and testing.



**Above:** Jochim Feuerherdt, Managing Director of TESTING Bluhm & Feuerherdt, has worked at the company since its foundation in 1978. He developed the company's first measurement devices, air entrainment meters for fresh concrete (below).



**Right:** A semi-automatic, electronic Blaine apparatus, one of TESTING's best known testing devices for the cement sector.



**Right:** An automatic 12 needle point TESTING Vicat apparatus.



**GC:** Last time we spoke, we discussed the company's international expansion. Has this developed?

**H-HR:** We have continued this line of development, with the recruitment of our own 100% TESTING-employed sales and service employees in Malaysia - for South East Asia - and in the Middle East. This allows the best possible representation for our company, not just for new product sales but for calibration, maintenance and aftersales services. We also have employed a new representative for the south of Germany, Austria and Switzerland.

**GC:** How has the Covid-19 pandemic affected TESTING Bluhm & Feuerherdt?

**H-HR:** The pandemic did not affect us in terms of product sales. In fact, 2020 was a record year for us. The first quarter of 2021 also shaped up well. Construction, following a lull in the second quarter of 2020, has returned to pre-pandemic levels in most world regions.

Of course, changes were made to how we worked in our fabrication sites and offices. Those who are able to work from home do so, although due to the volumes of equipment we produce that represented only around 10% of the workforce. For those working on-site, we introduced various new hygiene and distancing protocols, including lateral flow tests for all staff. We have recorded four positive cases so far but have been able to identify and isolate these very quickly. Overall, the changes have not slowed us down to a great extent.

With respect to dealing with clients, we have adopted a mixed approach involving online meetings and some local visits in cases where the client makes that request and it is safe to do so. For destinations further afield, we have worked with a range of new partner companies who physically install equipment and / or spare parts before TESTING then commissions and calibrates the equipment remotely.

As part of this approach, we are also in the final stages of developing a virtual reality-based solution for training. The user puts on a headset in front of



**Above:** TESTING is introducing virtual reality systems for training.

the machine and relays what they see back to the TESTING trainer in Germany, also wearing a headset. They can even see each other in virtual reality and converse one-to-one, make changes to the machine and operate as if they are in the same room.

If you had asked me 12 months ago what would happen to our sales without on-site customer visits, I would have not have been hopeful. However, we now realise that business carries on anyway. Remote working can also save a lot of time.

**GC:** Where were the best markets for the company in 2020?

**H-HR:** Africa was particularly strong for us in 2020, with big pieces of equipment sold to South Africa, Tanzania, Kenya, Gabon and many more. On the other side of the coin, India was surprisingly weak for equipment sales in 2020. The US was also very inactive for much of the year before a sudden upswing in December 2020. This has now built up strongly during the first quarter of 2021, almost like a release of pent-up demand. In Europe, Germany remains important but exports now represent around 50% of all of our sales.

**GC:** Has the pandemic changed the type of equipment sold?

**H-HR:** There is an increased emphasis on computer controlled equipment, which was increasing before



**Far Left:** A multi-station computer-controlled bond strength tester for 0.4-20kN with deformation measurement.



**Left:** Interior views of a TESTING Mobile Laboratory, a relatively new development that allows clients high levels of flexibility.



**Above:** Even at the age of 86, Jochim Feuerherdt still speaks with all staff every day.

the pandemic in any case. It is hard to separate the effects of the pandemic from this background trend and I don't think we can conclude that Covid-19 sped up this trend.

**GC:** What are the latest products to be launched by TESTING Bluhm & Feuerherdt?

**H-HR:** We have recently launched a device to test the bond strength of tile adhesives and other cementitious products. There is also the Torque Mixer, which was developed during a research project with a German University. It uses a torque sensor to show the viscosity of the concrete mixture as water is added. This identifies the correct water ratio and makes it easier to maintain the right consistency. The device controls the amount of water added, the rate at which it is added and the mixing speed. This has applications for the use of concrete as a material

**Below:** View of a TESTING Torque Mixer.



for 3D printing. There is also a new device we are developing for testing the number and distribution of micropores in fresh concrete. So, you could test the mixture as it arrives on site and see whether or not it will stand up to freeze-thaw cycles. Currently the only measurements you can make of this are after the concrete has been laid, which is not a lot of use if you are building a highway.

We constantly receive interesting queries from all kinds of users, particularly cement plant quality control laboratories, which keep us very busy. We are always keen to take on new challenges and develop new solutions.

**GC:** Has the trend to lower clinker and lower CO<sub>2</sub> blends changed the demands placed on your equipment?

**H-HR:** The trend to low-CO<sub>2</sub> and low clinker blends is not something that has impacted us greatly so far. Clients always ask for customisation, yes, but it is not something that relates particularly to new blends at this moment. That said, the concrete and mortar sector continues to challenge us. Strength, for example, is increasing all the time. The pace of development continues to be fast and new areas are constantly opening out before us.

**GC:** What is the biggest challenge for TESTING Bluhm & Feuerherdt over the next 2-5 years?

**H-HR:** TESTING is not the cheapest supplier, nor does it produce the most pieces of equipment. What we seek always, is to be the technical leader in cement, concrete and mortar testing. I feel that we are in this position at the moment, which has helped us stand up well to the Covid-constrained business world. Our customers appreciate this quality and often promote the use of our laboratories as a selling point for their own cement and concrete products. However, it is a constant effort to keep up with the demands of the sector and retain our position as the technical leader.

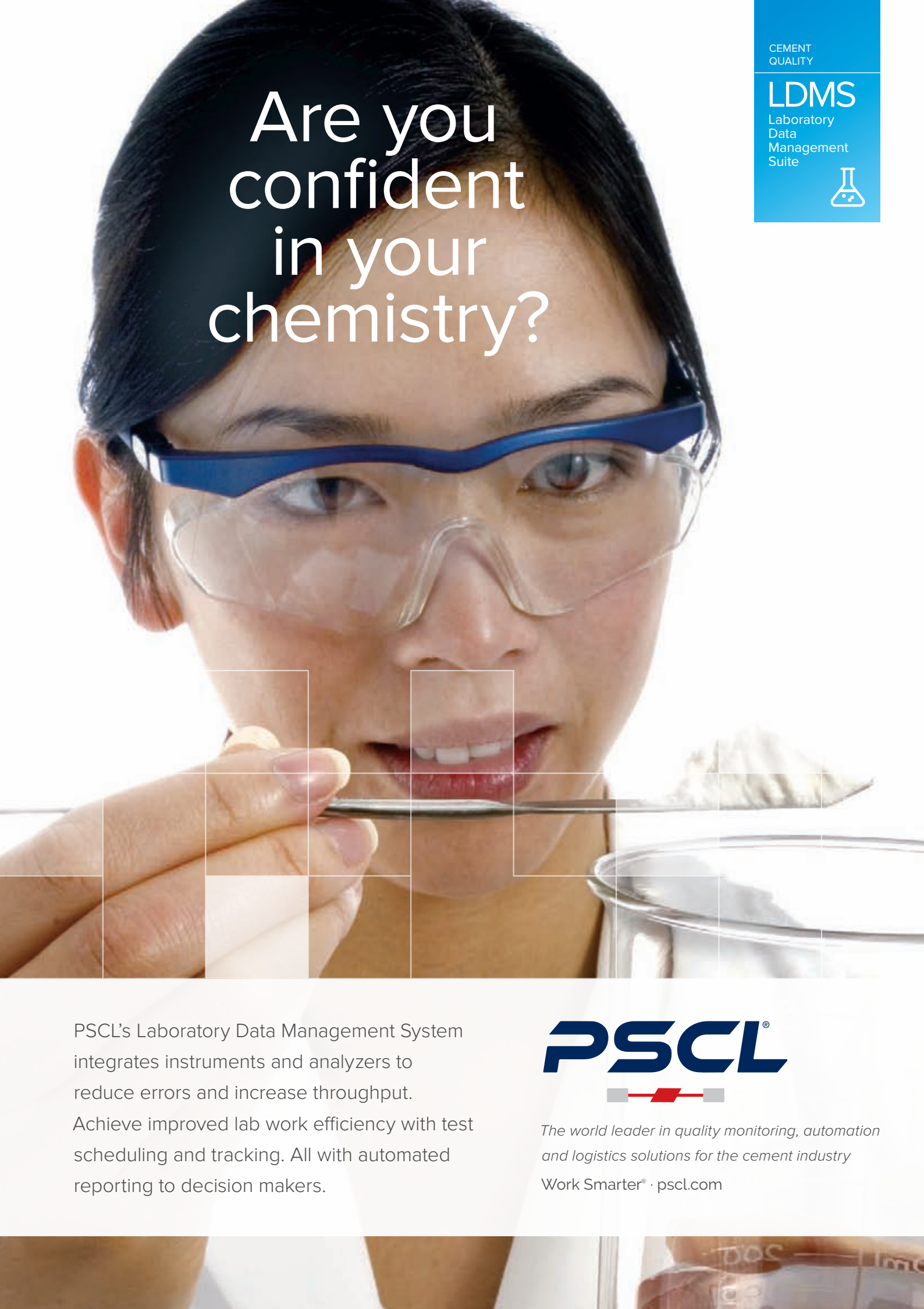
Another challenge is to adjust to the new size of our company, which will expand from 50 to 70 people over the course of 2021. We will need new internal processes and methodologies to accommodate this growth. The company will also feel different as it grows. It is important to include all staff on this journey. This will be helped by Mr Feuerherdt, who still comes to the office every day, even during Covid-19, at the age of 86. He speaks with everyone daily and provides a great motivating force for us going forward.

**GC:** Hans-Heinrich Reuter, thank you for your time today.

**H-HR:** You are very welcome indeed.







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Antonio Garcia, VisionTIR

## Early fire detection in cement plant storage areas

VisionTIR's Antonio Garcia looks at the uses of thermographic cameras for early fire detection in cement plants.

**Opposite top:** View of a coal storage area as seen via thermographic camera.

The storage of the various raw materials, alternative fuels and additives is an important aspect in the production of cement, as it is essential to keep enough stock in cement plant storage areas to ensure continuous production. Alternative fuel storage buildings, as well as areas of the plants that store fossil fuels - e.g. coal - require the prevention and detection of any fire due to the potential risk of spontaneous combustion during storage.

In the case of coal, spontaneous combustion is caused by adsorption of oxygen at the outer and inner surface of the coal particle, which results in oxidation. This is an exothermic reaction which causes the temperature of the coal stack to gradually rise. As the pile exceeds approximately 800°C, ignition can occur, although spontaneous combustion depends on many factors. Critical among these is the type, age and composition of the coal.

### Keep an eye on it

Continuous temperature monitoring and early fire detection are necessary to avoid damage to facilities and injuries or fatalities to workers that may result from spontaneous combustion. Early fire detection systems based on infrared (IR) cameras allow real time detection of fire hazards before a fire breaks

out. These advanced technology systems are able to measure and monitor the temperature distribution in the cement plant storage areas. Such cameras are normally protected by rugged protective housings to withstand the aggressive ambient conditions that invariably surround the system in a cement plant.

A complete infrared camera-based system should include software with the following capabilities: real time inspection, fast and precise temperature measurement, full remote control of all infrared cameras, configuration of different inspection zones, pre-alarms and alarms, notification of alarms by email, SMS or digital outputs, recording functions for both images and video, as well as the function to analyse the data recorded.

Some advanced early fire detection systems include discrimination capabilities, avoiding unwanted alarms due to moving vehicles and objects. On the other hand, these systems in some cases have been directly integrated with fire extinction systems, for example water cannons (below right).

### Early fire detection in cement plants using alternative fuels

Cement plants have used alternative fuels as an energy source since the mid-1980s. The primary goal in substituting fossil fuels is to enable the industry to remain economically competitive, as fuel consumption accounts for almost one-third of the cost of producing clinker. The use of alternative fuels has a positive impact on the environment.

Alternative fuels such as those derived from waste have a high ignition capacity. The storage of this type of material requires monitoring and control to avoid any fire that could cause damage to people and / or facilities.

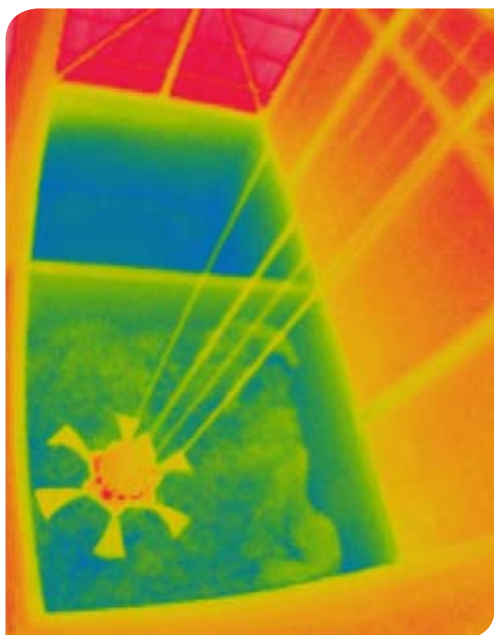
Votorantim Cimentos has installed a system based on thermal cameras to monitor and measure

### Opposite bottom:


Automatic water cannons can be deployed to decrease the temperature of hot-spots.

**Below:** VisionTIR IR camera installed at a cement plant.





the temperature of its alternative fuel storage facilities in Brazil. This early fire detection system, developed by VisionTIR, has already been installed in different Votorantim Group cement plants and several have operated successfully for many years. The systems' high standard of performance has led Votorantim to progressively install such systems across its production base.

Another example is the cement manufacturer LafargeHolcim, which also utilises VisionTIR's technology to monitor storage areas containing waste tyres that are used as a fuel. 



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Gambarotta-Gschwendt Srl

## Product focus: Gambarotta-Gschwendt's TIREX surface feeder

A proven civil-works free surface feeder from the Italian equipment producer.

In many cases, cement sector bulk materials, be they clinker, alternative fuels, coal, gypsum, limestone, clay or other materials, enter the plant by trucks, dumpers or front loaders. The most common approach is to unload the material on the ground and then load it onto a hopper. This process is inefficient and needs a lot of personnel-hours.

The TIREX surface feeder, first supplied to Cementos Avellaneda in Argentina in 2010, is intended to improve this step by directly taking bulk material, storing it with a capacity of 30-400m<sup>3</sup> and delivering it to the subsequent conveyor, usually a bucket elevator or a belt conveyor. Its main structure can withstand both the force of the material

being unloaded and the weight of up to three trucks that can be placed at the rear of the machine for discharge operations.

The TIREX is eco-friendly. A de-dusting cover guarantees no dust leakage during discharge and conveying operations. Leakage is minimised during the conveying phase via a train of high quality steel plates, connected to a high strength steel chain on both sides and surrounded by a strong shear proof rubber belt. This means that the pathway comprises a straight horizontal track, where the material is initially discharged, followed by an inclined track in which the material is conveyed to the outlet chute.

Another advantage is the lack of civil works required. Only a solid concrete base is required, as well as a ramp for truck access. This ensures a high level of flexibility for plant operators.

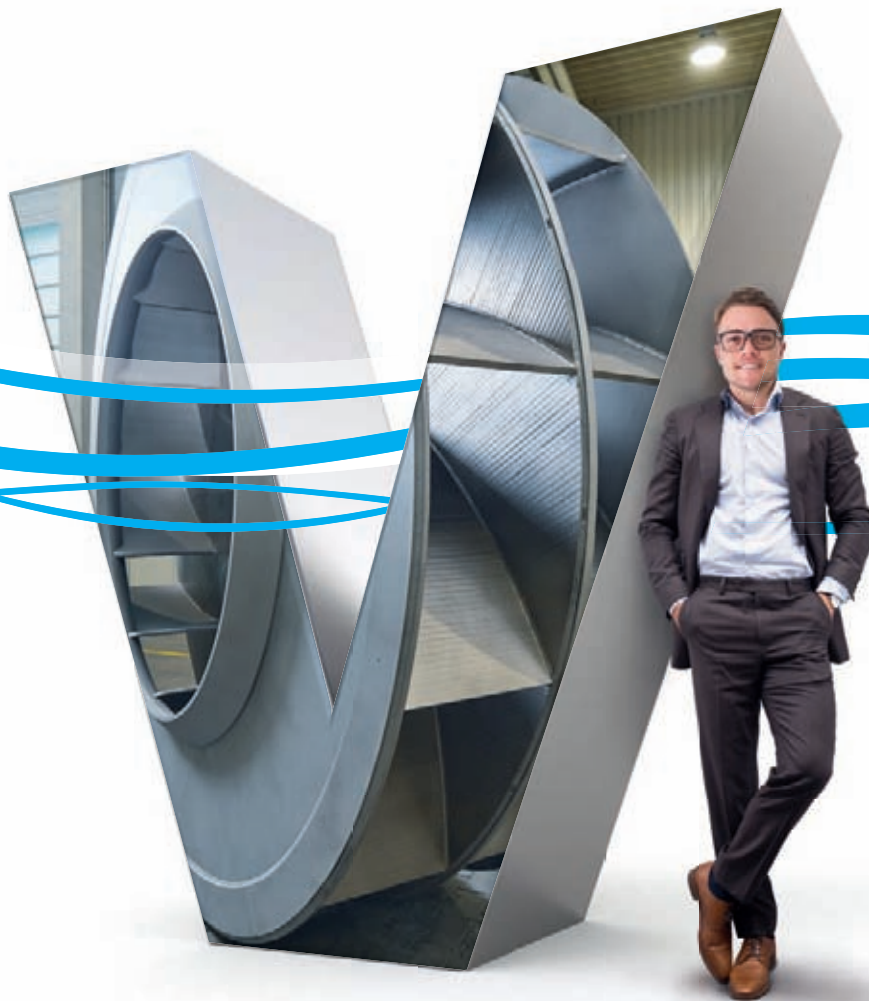
Hauling is taken care of by a reliable and powerful variable frequency drive system, placed on top of the pathway of the TIREX Surface Feeder. Depending on the required machine capacity, the drive station can be supplied with single or double motors and the feed speed is fully adjustable. The powerful planetary gearboxes can withstand power peaks during operation, ensuring high reliability.

Gambarotta-Gschwendt recently received two orders for the supply of five TIREX Surface Feeders for clients in China, with another four destined for South America. TIREX Surface Feeders have also recently been purchased by CBMI for ongoing plant projects in the Philippines and in Argentina.

**Right:** A TIREX Surface Feeder from Gambarotta-Gschwendt.



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## US: Cemex acquires Beck Readymix Concrete

Cemex USA has acquired Beck Readymix Concrete. The ready-mix producer operates three concrete plants in San Antonio, Texas and an additional portable plant.

Cemex's Texas Regional President Scott Ducoff said "Texas is experiencing explosive growth and Cemex has repeatedly shown it is ready to make moves to help fuel it. By acquiring these facilities, Cemex will be able to deliver our high-quality products that many Texans are already familiar with to satisfy the high demand of customers of one of the state's most dynamic markets. We welcome our new employees and look forward to a smooth transition for them."

## Switzerland: 100% concrete recycling process developed by Sika

Sika has developed ReCO2ver, a process which produces limestone, sand and gravel from the combination of concrete and CO<sub>2</sub> with an additive developed by the supplier. The process enables demolition companies to completely recycle used concrete, while storing captured CO<sub>2</sub> at a rate of 60kg/t of crushed concrete. The materials produced can be used as aggregates to make concrete of comparable strength to an all-new product.

Chief executive officer Paul Schuler said "The five largest European Union countries alone generate roughly 300Mt/yr of old concrete. With complete recycling of these materials, up to 15Mt/yr of CO<sub>2</sub> emissions can be stored. We are convinced that our new process has the potential to benefit both our customers and the environment."



## Spain: Cemex supplying large dam project

Cemex is supplying concrete to the site of the Santolea Canyon dam in Aragon. The 59m-high structure will hold a 105hm<sup>3</sup> (cubic hectometre) reservoir, which will provide water to 2000 surrounding farms. Concrete pouring began at the site in March 2020 and is scheduled to reach completion in mid-2021.

Cemex's Europe, the Middle East, Africa, and Asia regional president Sergio Menendez said "We are very proud of our participation in the construction of the Santolea Canyon dam, a key project requiring materials and solutions of the highest technical and environmental specifications. The new Santolea dam will greatly contribute to support sustainable growth in the region."

## India: ACC launches ECOPact range

LafargeHolcim subsidiary ACC launched its ECOPact range of reduced-CO<sub>2</sub> concrete products in Hyderabad and Mumbai in February 2021. A full nationwide rollout is ongoing.

ACC Managing director Sridhar Balakrishnan said "The innovative manufacturing process of the ECOPact range reduces CO<sub>2</sub> emissions by up to 100% and further enhances our sustainable products offerings for the construction industry."





### Interested in concrete?



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### Saudi Arabia: Saudi Readymix launches ACI-certified courses

Saudi Readymix has received a certification from the American Concrete Institute (ACI) to provide ACI certified courses. The courses form a minimum qualification for concrete industry workers.

### UK: SigmaRoc launches cement-free concrete block

SigmaRoc has launched Greenbloc, a cement-free concrete block. The product reduces emissions by 77% compared to concrete blocks produced with ordinary Portland cement (OPC), corresponding to a reduction of 1.1kg/block.

SigmaRoc CEO Max Vermorken said "Our Greenbloc range and brand is the brainchild of our innovation and technical teams. It addresses a key challenge in the building products industry - the embodied CO<sub>2</sub> in one of the most widely used building materials: the concrete block. Greenbloc is only the start of a range of sustainable alternatives to our product offering as we invest, improve, integrate and innovate."

### Spain: Cementos La Cruz working on zero-CO<sub>2</sub> concrete

Cementos La Cruz has partnered with other building materials, construction and waste management companies and the Murcia Technological Centre for Construction to support a study by the Polytechnic University of Cartagena (UPCT) with the aim to develop geopolymers from industrial and urban waste, without the use of cement. The study is 80% financed by the European Regional Development Fund (ERDF).

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ARC Innovations

## Low-CO<sub>2</sub> concrete blends with ARC Innovations

South Africa-based ARC Innovations introduces its practical approach to the production of low-CO<sub>2</sub> concrete mixtures.

ARC Innovations was founded by Cyril N Attwell with the objective of pushing the limits of alternative solutions for the challenge of sustainable construction via the production of composite cements. The company produces hybrid cement binders, a type of inorganic polymer that can be formed at room temperature by using industrial waste or by-products as source materials to form a solid binder. These look like and perform a similar function to normal cement. The development, commercialisation and use of hybrid cement technology can provide materials for a more sustainable and environmentally-responsible construction sector.

Hybrid binders can be used in applications to fully or partially replace cement, with important environmental, technical and cost benefits, including <90% reduction in CO<sub>2</sub> emissions. They comprise aluminium and silicon instead of calcium and silicon. Aluminium sources are not present as carbonates and therefore, when made active for use as cement, do not release vast quantities of CO<sub>2</sub>. Recycled materials and byproducts, including fly ash and slags, can be used.

**Below:** Concrete pour at the Perdekraal Wind Farm, a project that used ARC-designed concrete.

With only a few additional requirements, placing hybrid concrete is very similar to placing traditional cement concrete, which means any conventional concrete crew is able to place it without additional training or expensive equipment.

The engineering and construction properties of hybrid cement, when used to make concrete, have been repeatedly and independently shown to be equivalent or better than traditional ones.

Hybrid cement exceeds traditional cement performance specifications in areas such as chemical / salt resistance and fire resistance. Indeed, its fire resistance has been shown to be well over twice that of traditional concrete, which has distinct benefits, particularly in high-rise construction. Hybrid cement also produces fewer cracks and offers excellent frost resistance and durability.

### Unusual mixes, normal applications

For large projects, the hybrid cement binder design depends on the resources available around the job-site, with potential mixtures evaluated on CO<sub>2</sub> footprint, desired chemistry, crystallography and cost. By-products and unnatural resources will be sourced within 200km, commercial materials within 50km.

### Case-studies

**Loeriesfontein Wind Farm:** Using ARC technology, South African construction firm Murray & Roberts was able to use waste water with high sulphates and nitrates as mixing water for concrete during the construction of a wind farm in Loeriesfontein, Northern Cape. This water would have been considered inadequate for traditional concrete and, due to the project's desert location, an alternative supply of water would have to have been shipped in by road tanker from ~100km away. Over the 18 month period of construction, ARC's approach avoided the transportation of ~15,700t of water, which would have been transported via 10t water bowsers, a total of 1570 200km round-trips.



**Transnet City Deep Container Terminal:** In 2013 Murray & Roberts completed the construction of South Africa's first commercial and industrial 0%-Portland cement concrete during the construction of the Transnet City Deep Container Terminal. Three large test sections were cast to review the long-term durability, compressive strengths and abrasion resistance. The 0% Portland cement exceeded requirements, out-performing the Portland cement concrete. The use of the 0% Portland cement concrete, and other portions that used other proportions of PFA, led to a 35% reduction of CO<sub>2</sub> emissions from concrete materials, an overall saving of 6.6Mt.

**Msikaba Bridge:** The Msikaba Bridge in Tahle, Eastern Cape, is scheduled to become the second-longest span crossing in Africa, with a tower to tower distance of 580m upon completion in 2024. In 2017 the South African National Roads Agency awarded the tender for the bridge's construction to the Concor Mota-Engil Joint Venture, which comprises Concor, a South African-based construction company, and Mota-Engil, a Portuguese construction company, at a cost of US\$118m. ARC Innovations will supply hybrid concrete binders to the project, which will require a total of 28,000m<sup>3</sup> of concrete.

## Retail and other products

ARC Innovations also offers a range of products for smaller projects, including:

**Bagged cement (Variant 1):** Up to 80% Portland cement replacement with pulverised fuel ash (PFA), while maintaining setting times of a 100% Portland cement material and achieving the required compressive strengths of 32.5 or 42.5 categories;

**Bagged cement (Variant 2):** Up to 95% Portland cement replacement with ground granulated blast furnace slag (GGBS), while maintaining setting times of a 100% Portland cement material and achieving the required compressive strengths of 32.5 or 42.5 categories;




**Above:** An ARC concrete pour at the Golden Valley Wind Farm, carried out by Concor Infrastructure.

**Premix products:** Up to 100% replacement of conventional Portland or alumina cements with eco-binders based on zero CO<sub>2</sub> emission material to produce flowable bearing grouts, repair mortars and screeds;

**Radioactive absorption:** Eco-concretes and eco-grouts containing pseudo-zeolites that absorb nuclear radiation and particles;

**Refractory cements:** Heat-resistant concretes and linings containing eco-binders with good insulation properties;

**EcoShotcrete:** This is used to reinforce both temporary and permanent excavations. It may be employed, in combination with lagging and other forms of earth anchor, to stabilise excavations for underground structures or high-rise buildings during construction;

**Road Stabilisation:** ARC produces two organic-based mechanical road stabilisation systems that are enhanced by exposure to environmental elements. One of the two variants has zero CO<sub>2</sub> emissions. 

**Below:** A section of the Transnet City Deep Container Terminal that was laid with 0%-Portland cement containing concrete in 2013.







Contents

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Ad Index

## India: UltraTech orders nine vertical roller mills from Gebr. Pfeiffer

Germany-based Gebr. Pfeiffer has received an order from Aditya Birla subsidiary UltraTech Cement for nine vertical roller mills. The producer plans to install the mills across three newly-built clinker lines. The supplier said, "The cooperation between UltraTech Cement and Gebr. Pfeiffer is based on the understanding of not only being a customer or supplier, but to achieve common goals in partnership."



## Germany: Schenck launches CONiQ

Schenck Process has launched CONiQ, a cloud-based software product designed to access data from its machines. The company said that it builds the foundation for all digital services of Schenck Process, enabling data-driven maintenance and performance optimisation. Users are able to monitor equipment using CONiQ's integrated knowledge base. The supplier said that the product will open up 'new functionalities' for various cement plant equipment. Its first version will focus on vibrating screens and provide dashboards and functions to improve condition monitoring.

## UK: Wall Colmonoy introduces ColWear Plates

Wall Colmonoy has introduced high-quality ColWear Plates, which it says are ideally suited for high-demand industrial fans due to their wear protection, as well as enhanced resource and energy efficiencies. The company says that ColWear Plates are lighter and more uniform than traditional wear-resistant materials. This can make the fan more energy efficient and more balanced, particularly important for the impellers, as it reduces the amount of adjustment required.

## US: Aquamist by Terex launched

Terex, a global manufacturer of lifting and materials processing solutions, has introduced 'Aquamist by Terex,' a dust suppression system that is now available across its EvoQuip, Fuchs, Powerscreen, Terex Ecotec, Terex Finlay, Terex MPS and Terex Washing Systems materials processing brands.

Terex says that the system offers an improvement over conventional jets and water-sprays to manage the build-up of dust and better protect workers on jobsites by using a high-capacity misting fan that produces finely divided water droplets in the size range 10-150µm in diameter. At this size, they easily combine with dust particles of similar dimensions and precipitate them out of the air. As water-mists are suspended in the air for longer than a conventional spray, they cover and envelop the dust cloud more effectively.

## Russia: New CEM II product for Eurocement

Eurocement has expanded its cement range with a new CEM II cement produced with the siliceous sedimentary rock tripoli. The group said that the product is suitable for use in settings requiring high durability, for example marine hydraulic structures and underground construction.

## US: N2® Twist™ system from Martin Engineering

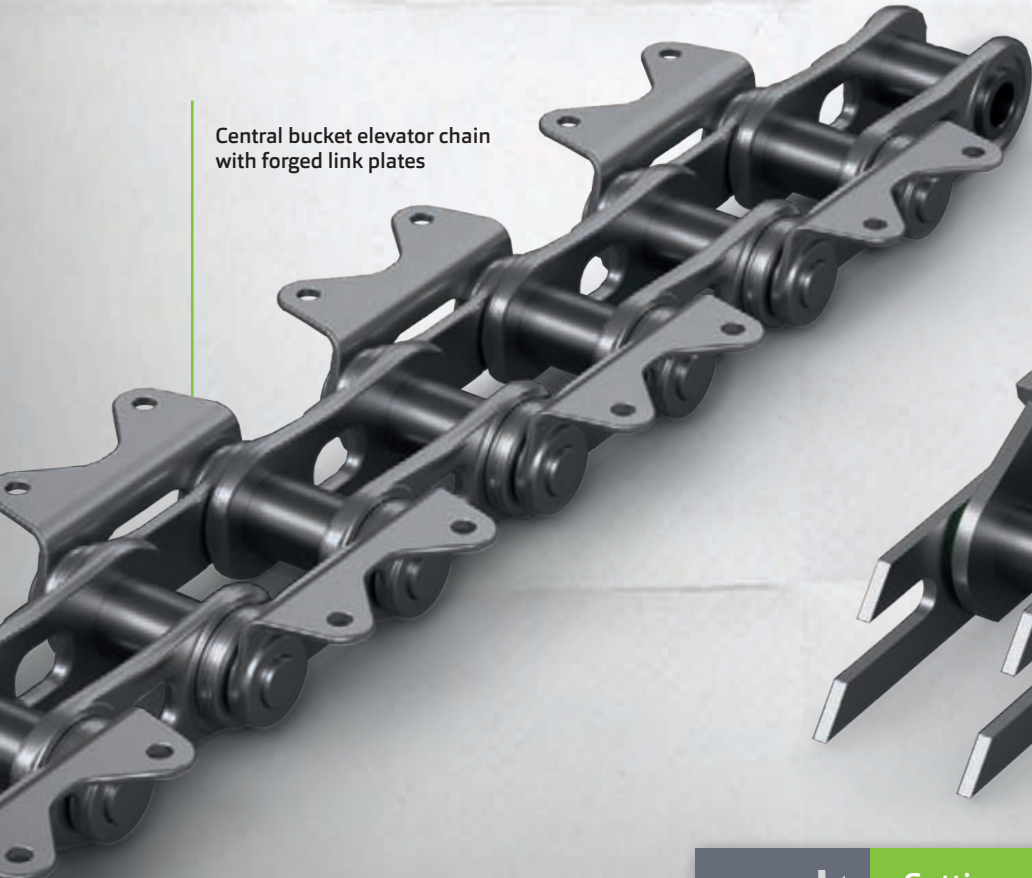
Martin Engineering has launched the N2® Twist™ Tensioner, below, which it says provides the best possible cleaning performance throughout the life of the conveyor belt cleaning blades. The system also alerts operators on the Martin Smart Device Manager App when the blade needs changing or if there is an abnormal condition. The result is efficient cleaning, increased safety, reduced labour and a lower cost of operation. The company says that the N2 Twist Tensioner automatically maintains precise cleaning pressure throughout the entire life of the blade, without maintenance.




Image: The N2 Twist Tensioner.  
Source: Martin Engineering.

# “SUITED FOR HARSHEST CONDITIONS”

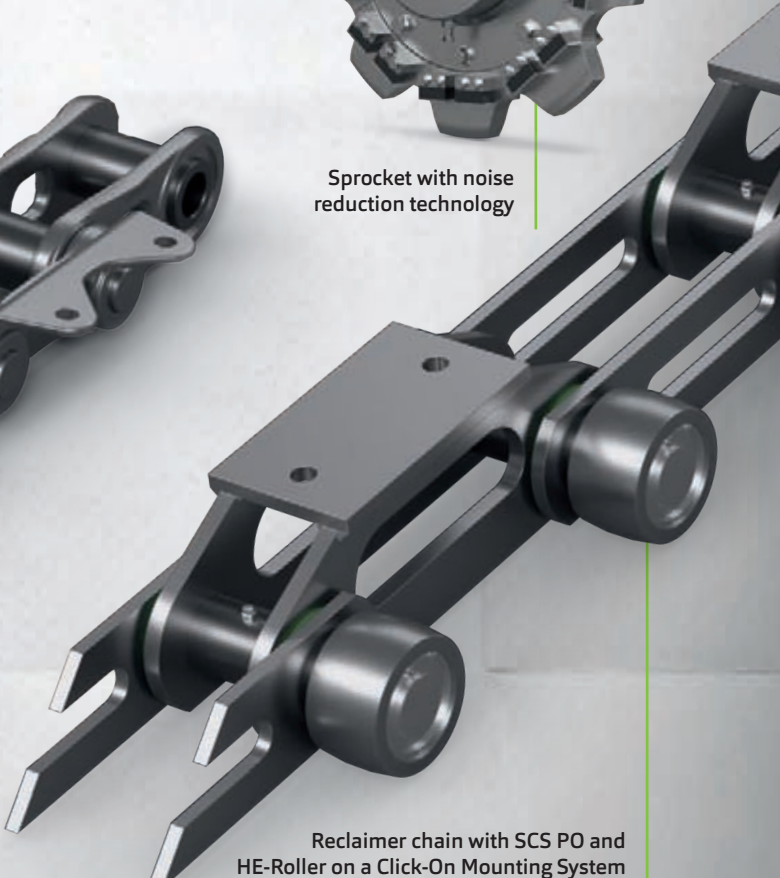
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## Switzerland: LafargeHolcim sales fall

LafargeHolcim's consolidated net sales in 2020 were Euro21.1bn, down by 5.6% year-on-year on a like-for-like basis from Euro24.4bn in 2019. The group recorded recurring earnings before interest and taxation (EBIT) of Euro3.35bn, down by 2% from Euro3.74bn. Its cement sales fell to 190Mt, down by 7% from 208Mt. It noted an increase in bagged cement sales in emerging markets.

By region the group reported like-for-like growth in sales and earnings in Asia-Pacific, driven by recovery in India and China, despite weaknesses in the Philippines and Australia. Earnings rose despite falling sales in Europe, Latin America and North America, with a resilient market noted in Central Europe and an 'outstanding' year reported in Latin America. Middle East Africa reported falling cement demand and adverse market effects from the coronavirus pandemic, although Nigeria remained buoyant.

## Russia: Eurocement results improve

Eurocement recorded earnings before interest, taxation, depreciation and amortisation (EBITDA) of US\$182m in 2020, up by 6% year-on-year from US\$172m. Sales remained consistent with 2019 levels at US\$674m. The results were partly disclosed in a presentation related to the sale of its parent company, GFI Investments and related debts. Potential investors had until 15 March 2021 to submit price indications, with the sale scheduled for conclusion in April 2021.

## Germany: HeidelbergCement preliminary results for 2020 decline

HeidelbergCement's preliminary results show a 5% decline in revenue on a like-for-like basis to Euro17.6bn from Euro18.9m. Cement volumes fell by 3% to 122Mt from 126Mt. Its result from current operations before depreciation and amortisation (RCOBD) rose by 6% to Euro3.71bn from Euro3.58bn. Revenues and cement volumes declined in all regions except Africa-Eastern Mediterranean Basin, where revenues rose by 7% and volumes rose by 10%, and Northern and Eastern Europe-Central Asia, where revenues rose by 3%.

The group attributed the general decline to the impacts of the coronavirus on construction activity levels, and therefore demand for building materials. A 'significant improvement' in results in the second half of 2020 resulted from its own cost-saving programmes and the economic recovery in mid-2020. The producer implemented a major carbon capture and storage (CCS) scale-up in the form of its LEILAC (Low Emissions Intensity Lime And Cement) collaborative project. Throughout the year, it reduced its debt by Euro1.5bn.



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## Germany: Rüdersdorf to hit net-zero CO<sub>2</sub> emissions by 2030

Cemex Zement has set up an innovation acceleration partnership called Carbon Neutral Alliance to support its work to achieve net zero CO<sub>2</sub> emissions at its Rüdersdorf cement plant by 2030. The association will work to develop industrial-scale demonstration projects in line with the company's Future in Action programme.

Carbon Neutral Alliance's scope will include carbon capture and storage (CCS), the transformation of captured CO<sub>2</sub> into building materials, synthetic fuels and green hydrocarbons, hydrogen production and waste heat recovery (WHR). Cemex plans to share the knowledge gained by the alliance across its global cement production network.





## France: Vicat earnings rise despite Covid-19 pandemic

Vicat recorded full-year consolidated sales of Euro2.81bn in 2020, up by 2% year-on-year from Euro2.74bn in 2019. Earnings before interest, taxation, depreciation and amortisation (EBITDA) rose by 6% to Euro557m from Euro526m. Consolidated net income rose by 8% to Euro172m from Euro160m.

The group said that organic sales were 'strong,' rising in all regions except in France, by 6% in total. It attributed the decline to a near-total shutdown due to the coronavirus outbreak in mid-March 2020, which lifted incrementally throughout the first half of the year. Vicat France's cement business recovered 'robustly' in the second half of 2020, resulting in an operational sales increase of 3% for the year. Full stoppages of activity lasted for 33 days in India and for 30 days in Italy. Despite these challenges, business growth, cost-cutting and lower energy costs drove earnings growth, with 'very sharp improvements' recorded in the Americas and in Asia. Additionally, the ramp-up of a new grinding plant in Mali and production performance improvements in Senegal supported a 'significant' earnings increase in Africa.

## Ireland: CRH results up 5%

CRH's consolidated earnings before interest, taxation, depreciation and amortisation (EBITDA) grew by 5% year-on-year on a like-for-like basis to US\$4.6bn in 2020 from US\$4.5bn in 2019. Sales fell by 2% to US\$27.6bn from US\$28.1bn. The group reported a net debt/EBITDA ratio of 1.3x, its lowest since 2010.

By division the group reported growth in its US cement sales volumes in 2020 on a like-for-like basis due to demand in the west, surpassing the negative effects of the coronavirus pandemic elsewhere. However, volumes fell in Canada, particularly in the first half of the year. In 2020, CRH adopted the Ash Grove brand for all its North American cement businesses, unifying 12 cement plants and 42 cement terminals under one brand. In Europe sales and earnings fell due to poor markets in the west despite better conditions in the east. The group noted that it grew its profit in the Philippines due to a strong recovery in the second half and cost savings despite plant shutdowns.



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## UK: Padeswood to be site of 800,000t/yr CO<sub>2</sub> capture plant

HeidelbergCement subsidiary Hanson has partnered with the HyNet North West consortium for a study on carbon capture and storage (CCS) solutions at its Padeswood, Flintshire, Wales cement plant. The consortium is planning to implement carbon capture and storage installations at industrial facilities across Flintshire, Wrexham, Cheshire, Merseyside, Greater Manchester and Lancashire. It says that when active the network will constitute the world's first low carbon industrial cluster, with a total reduction of 10Mt/yr of CO<sub>2</sub> emissions by CCS. The Padeswood plant would account for 800,000t/yr of this total.

Hanson group chief executive officer Simon Willis said, "Our involvement in the HyNet North West project is the latest example of our commitment to cutting CO<sub>2</sub> emissions. CCS at our cement plants will be a key part of our roadmap to achieve net zero carbon by 2050. The first step would be for us to carry out a feasibility study - this would give us a clear design basis and cost estimate for a capture plant and connection to the planned HyNet North West CO<sub>2</sub> network and storage system."

The HyNet North West project also includes production, storage and distribution of low carbon hydrogen, which will help to decarbonise other industries whose CO<sub>2</sub> emissions primarily come from fossil fuels. The project, led by Progressive Energy, is being developed by a consortium of regionally located partners including Cadent, CF Fertilisers, ENI UK, Essar, INOVYN and the University of Chester, as well as Hanson.



Image: Hanson Padeswood cement plant. Source: Hanson.

## UK: Hydrogen demo unit

HeidelbergCement subsidiary Hanson has installed a solar- and wind-powered hydrogen generation demonstration unit at its Port Talbot Regen ground granulated blast furnace slag (GGBFS) plant in Port Talbot in Neath Port Talbot, Wales. The company says

that the project is part of a collaboration with Swansea University's Energy Safety Research Institute under the European Research and Development Fund's Reducing Industrial Carbon Emissions initiative. The hydrogen generated by the installation will replace natural gas in the GGBFS plant's burners.

## Germany: Green bonuses at HeidelbergCement

HeidelbergCement has detailed how it uses bonuses to ensure country and cement plant managers achieve their CO<sub>2</sub> reduction targets.

CFO Lorenz Näger explained to financial analysts following the publication of the group's fourth quarter results for 2020, that a plant's annual reduction target is calculated against the group-wide '525 by 2025' target of CO<sub>2</sub> emissions of 525kg/t of cementitious material by 2025. Plant performance against this is multiplied with a financial target to determine a manager's bonus. This allows for the enlargement of bonuses at financially well-performing plants which exceed their emissions reduction targets. A similar mechanism is also used for country managers. Näger called the incentive mechanism a 'step-changer'.

## Turkey: Nuh exports 4.5Mt of cement

Nuh Cement exported 4.5Mt of cement in 2020, corresponding to 22% of Turkish seaborne cement and clinker exports and over 2% of global seaborne cement and clinker for the year. It says the volume is the highest recorded in any year by a Turkish cement producer. The company also delivered the highest exports to the US from Turkey.

## Spain: Lloseta plant to restart production

Cemex España has announced plans to resume activity at its Lloseta cement plant in Majorca at a limited production level. Local press has reported that the company will employ the staff who stayed on for maintenance purposes after the plant's closure in January 2019. Cemex is in the process of establishing a green hydrogen plant at Lloseta with a Euro10m EU grant. It said "We do not rule out that in the future the cement plant may adapt and become an industrial benchmark in the use of green hydrogen for the production of cement with a low CO<sub>2</sub> footprint."



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## GLOBAL CEMENT NEWS: EUROPE



### Austria: RHI Magnesita sales fall

RHI Magnesita recorded consolidated net sales of Euro2.26bn in 2020, down by 23% year-on-year from Euro2.92bn in 2019. Its earnings before interest, taxation, depreciation and amortisation (EBITDA) were Euro140m, down by 53% from Euro300m. Pre-tax profit for the year was Euro42.0m, down by 30%.

The group attributed the declines to lower refractory volumes as a result of the effects of the coronavirus pandemic on market demand. It said that customers began re-stocking supply chains at the end of 2020 and into the first quarter of 2021, driving increased refractory demand.

### Sweden: New Slite plant manager

HeidelbergCement subsidiary Cementa has appointed Matilda Hoffstedt as the manager of its integrated Slite plant. She will succeed the current plant manager, Fred Grönwall, in June 2021. Grönwall has been in post since 2018 and will leave the company.

Hoffstedt holds a master's degree in science from Uppsala University and started working for HeidelbergCement in 1998. She worked as a supervisor and project manager at Slite until 2010. Later she ran operations at the Skövde plant for 10 years until 2020 and is currently working as Manager Technical Support for HeidelbergCement Northern Europe.





Contents

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Ad Index

Peter Edwards & Jacob Winskell, Global Cement Magazine

## Cement in Austria and Switzerland

Global Cement Magazine reports on cement production in Austria and Switzerland.

**Right - Figure 1:** Installed cement capacity in Austria and Switzerland by producer.  
**Source:** Global Cement Directory 2021.

Austria and Switzerland are neighbours located in Alpine continental Europe. Each has a highly-developed market economy and very high standard of living. Both are part of the EU single market but only Austria is a full EU Member State. Switzerland is famed for its independence, opting for a state of 'permanent armed neutrality.'

### Cement industry introduction

Austria and Switzerland have 15 integrated cement plants, which share a cement capacity of 10.3Mt/yr. Plants are generally fairly small, with only two larger than 1.0Mt/yr. They are also old, with many dating from the 19th Century. However, they have been extensively modernised and updated, particularly with regards to process efficiency, emissions abatement and the use of alternative fuels.

The largest producer by some distance is the multinational LafargeHolcim, which is based in Switzerland. It operates a total of five plants that, between them, account for 4.5Mt/yr of capacity, 44% of the total for the two countries. Only one other producer, w&p Zement, owns more than one plant. It is the second-largest producer by installed capacity (1.2Mt/yr, 11.6%). Third are Vigier Ciment, part of France's Vicat Group and CRH (both 0.9Mt/yr, 7%).

**Below:** New graffiti on the west-facing side of the Kirchdorfer cement plant in Austria.  
**Credit:** Claudia Feßl, entrant to the Global Cement Photography Competition.



**W&P**  
1.2Mt/yr

**VICAT**  
0.9Mt/yr



**LAFARGEHOLCIM**  
4.5Mt/yr

**CRH**  
0.9Mt/yr

### Austria

Austria has nine cement plants, all integrated, which share a total capacity of 5.7Mt/yr across six Federal States. Lower Austria, Upper Austria and Styria each have two plants, while Carinthia, Salzburg and Tyrol have one each. These are shown in Figure 2.

With a capacity share of 30%, LafargeHolcim is Austria's largest cement producer. Its subsidiary Lafarge Zement operates an integrated production capacity of 1.7Mt/yr. It was founded in 1997 by France-based Lafarge upon the latter's acquisition of the 1.2Mt/yr Mannersdorf cement plant in Mannersdorf am Leithagebirge from Perlmooser Zementwerke AG.

Cement production at Mannersdorf dates back to 1904. KHD supplied the plant with its first dry kiln in 1968, bringing its capacity to 0.8Mt/yr. In 1984 the present line, a Parallel Air Serial Combustion (PASEC) system produced by a joint venture of Voest Alpine Austria and East Germany-based Sket ZAB Dessau, was installed. It is currently receiving alternative fuel processing upgrades from Beumer Group, is installing an A TEC flash calciner for alternative fuels drying and has ordered an LM 45.4 vertical roller mill from Loesche for raw materials grinding. *Read more about the Mannersdorf plant on Page 42.*

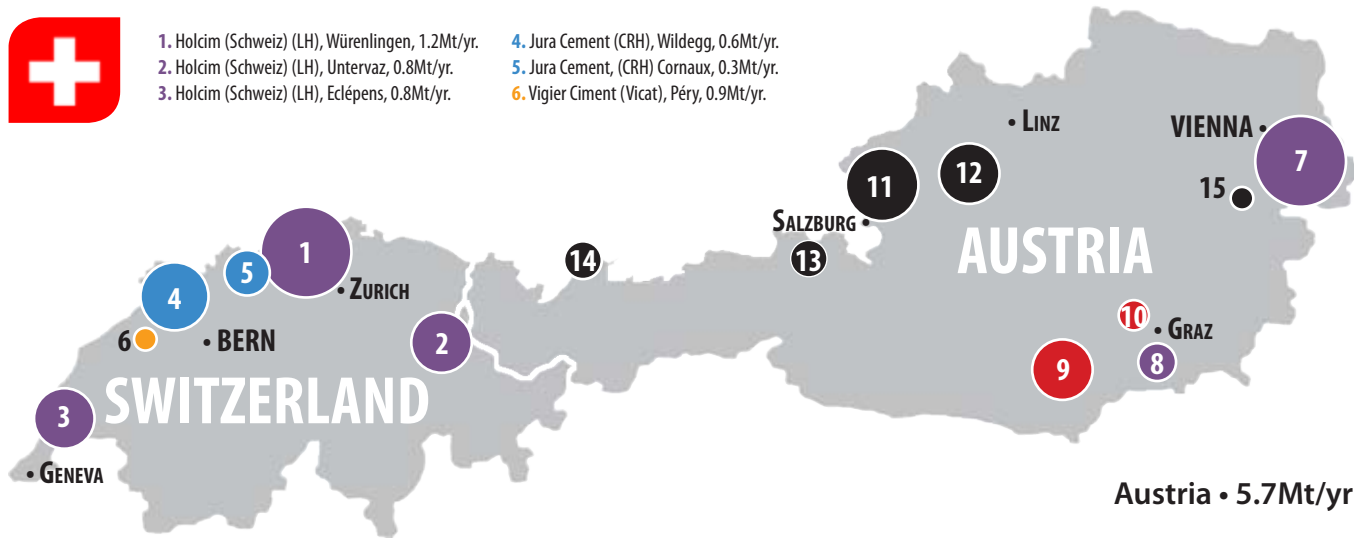
The 0.5Mt/yr Retznei cement plant in Styria is LafargeHolcim's smaller Austrian facility. It is currently one of the two EU cement plants that host the European Cement



## Switzerland • 4.6Mt/yr



1. Holcim (Schweiz) (LH), Würenlingen, 1.2Mt/yr.
2. Holcim (Schweiz) (LH), Untervaz, 0.8Mt/yr.
3. Holcim (Schweiz) (LH), Eclépens, 0.8Mt/yr.
4. Jura Cement (CRH), Wildeggen, 0.6Mt/yr.
5. Jura Cement, (CRH) Cornaux, 0.3Mt/yr.
6. Vigier Ciment (Vicat), Péry, 0.9Mt/yr.

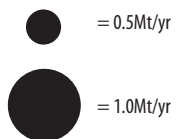


## Austria • 5.7Mt/yr

7. Lafarge Zement (LH), Mannersdorf, 1.2Mt/yr.
8. Lafarge Zement (LH), Retznei, 0.5Mt/yr.
9. w&p Zement, Wietersdorf, 0.8Mt/yr.
10. w&p Zement, Peggau, 0.4Mt/yr.
11. Zementwerk Leube, Gartenau, 0.8Mt/yr.
12. Z'werk Hatschek (Rohrdorfer), Gmunden, 0.8Mt/yr.
13. Kirchdorfer Zementwerk Hofmann, Kirchdorf, 0.5Mt/yr.
14. Schretter & Cie, Vils, 0.4Mt/yr.
15. Wopfinger Baustoffindustrie, Wopfing, 0.3Mt/yr.



**Above - Figure 2:**  
Cement plants in Switzerland and Austria.  
**Source:** Global Cement Directory 2021.



LH = LafargeHolcim.

Research Academy (ECRA)'s Oxyfuel CO<sub>2</sub> capture and storage (CCS) project. It burns over 80% alternative fuels.

w&p Zement is the second-largest cement producer in Austria. It traces its history back to the founding of a cement plant in Wietersdorf in 1893. The Wietersdorfer industrial conglomerate's cement business was merged with Peggauer Zementwerke Alois Kern in 1988. The company rebranded as w&p Zement in 2011 and mothballed the Peggau site in 2018.

The third-largest cement producer in Austria is Germany-based Rohrdorfer Group. It acquired Zementwerk Hatschek GmbH, which operates the 0.8Mt/yr Gmunden, Upper Austria, plant in 2004. The plant was founded in 1904. In 2018 and 2019 the company invested Euro50m in upgrades to production and a waste heat recovery (WHR) system that also provides heating to the local area.

Four smaller cement producers also operate in the Austrian cement market. Leube Zement operates the 167-year-old plant at Gartenau, close to Salzburg, today with a capacity of 0.8Mt/yr. Kirchdorfer Zementwerk Hofmann's 0.5Mt/yr facility is another extensively-updated plant, founded in 1880. Schretter & Cie's 0.4Mt/yr Vils plant produced its first batch of cement in 1904 and Wopfinger Baustoffindustrie operates the country's smallest cement plant, at 0.3Mt/yr.

### Production trends

Data from the Vereinigung der Österreichischen Zementindustrie (VÖZ), Austrian cement association, shows that cement production fell marginally in Austria in 2019 compared to 2018. The volume

of cement made was 5.23Mt, a year-on-year fall of 0.2%. This level is still somewhat higher than the 2014-2017 period, when production was in the range of 4.43-4.88Mt (See Figure 3). Clinker comprised 0.69t of every 1t of cement produced in Austria in 2019, broadly unchanged from 2018 and lower than 2017 (0.70t).

### Alternative fuels leader

Austrian plants produced clinker using an average alternative fuel thermal substitution rate of 78.4% in 2019, according to VÖZ. This was a marginal fall compared to the percentage used in 2018 (81.2%).



**Left - Figure 3:**  
Clinker and cement production in Austria, 2014-2019.

**Source:** VÖZ.

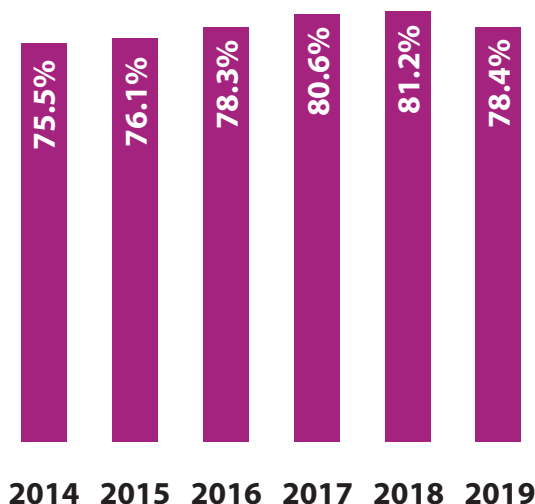




**Right - Figure 4:**

Proportion of alternative fuels used in the Austrian cement industry, 2014-2019.

Source: VÖZ.



The vast majority of the alternative fuel used consists of plastic-derived waste (357,388t), as well as used tyres (40,086t), paper (35,420t), waste solvents (24,540t), waste oil (19,692t) and assorted other alternative fuels (57,835t). The sector emitted 2.89Mt of CO<sub>2</sub> in total, around 846kg/t of clinker. Around 4.0GJ of energy was used for the production of 1t of clinker in 2019, around 2.3% more thermal energy than in 2018. The clinker-related specific emission factors for carbon monoxide, sulfur dioxide, total organic carbon, sum of metallic trace elements, dust and nitrogen oxides all improved year-on-year.

## Situation in 2020 and 2021

While data for 2020 is not yet available from VÖZ, it is likely that cement production will have fallen compared to 2019. Despite the country escaping the worst of Europe's first Covid-19 wave in early 2020, it was hit harder in the autumn. Construction contracted by 3.2% in real terms in 2020 as a result of pandemic-related disruption. At one point Strabag, the largest construction firm in the country, closed all of its sites. Following a record 6.7% drop in 2020, the IME currently forecasts the Austrian economy to grow by 4.6% in 2021.

**Below Right - Figure 5:**

Cement production in Switzerland, 2015-2020.

Source: CemSuisse.

**Below:** Vigier Cement's plant in Péry, Switzerland, installed ABB's Ability Knowledge Manager in 2018.

Source: ABB.



## Switzerland



Switzerland has six integrated cement plants that share a total cement capacity of 4.3Mt/yr. They are predominantly spread across the lower-lying areas of the country, close to the French and German borders.

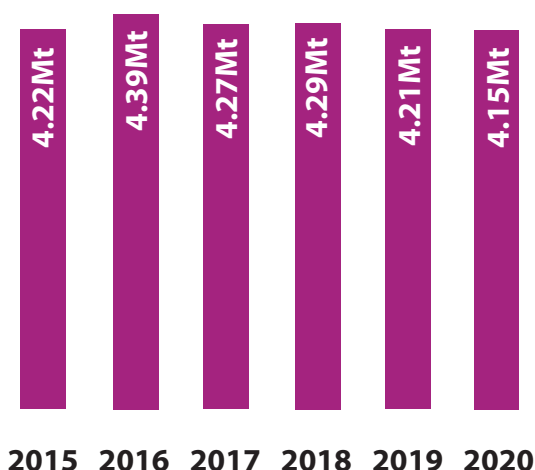
As in neighbouring Austria, the largest cement producer in Switzerland is LafargeHolcim, which is based in the country. Its subsidiary Holcim (Schweiz) operates three plants with an integrated capacity of 2.5Mt/yr - 58% of the national total.

The second-largest producer of cement is CRH, via Jura Cement. It entered the Swiss market in 2000. Jura Cement built its Wildeg, Aargau, plant in 1890 and converted it to a 0.6Mt/yr dry plant in 1986. It was recently reported that Dürr would supply a regenerative thermal oxidation (RTO) system to the plant as the main stage in its air pollution control system. The upgrade will enable the plant to comply with anticipated lower emission limits for carbon monoxide, hydrocarbons and ammonia. The supplier says its solution combines Dürr's Ecopure RTO multiple-chamber principle with an optimisation of the existing process technology in the calciner. It is scheduled to start operation in 2022. Jura Cement's other plant opened at Cornaux, Neuchâtel in 1966, with a capacity of 0.3Mt/yr. Both plants have an alternative fuel substitution rate of 70%.

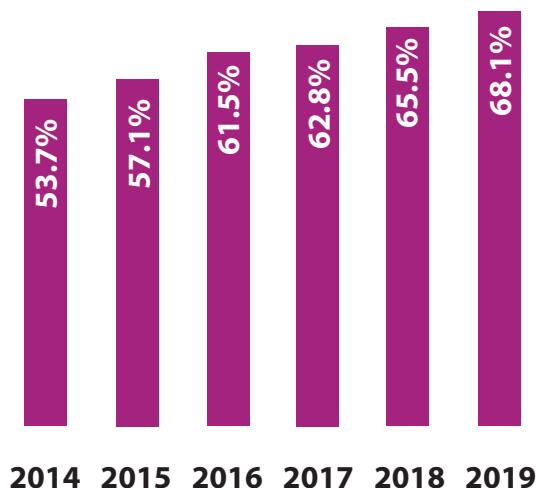
Vicat controls 0.9Mt/yr of capacity via its subsidiary Vigier Ciment, which began production at its Péry, Vaud, plant in 1890. It was upgraded to its current capacity configuration in 2001.

## Production trends

Swiss cement plants produced 4.21Mt of cement in 2019, a 1.8% year-on-year decline compared to 2018 (4.29Mt). Figure 5 shows production trends over the second half of the 2010s.







**Above - Figure 6:** Proportion of alternative fuels used in the Swiss cement industry, 2014-2019. **Source:** CemSuisse.

Deliveries remained stable in the first quarter of 2020 before falling by 3.3% year-on-year in the second quarter due to the first wave of the Covid-19 pandemic. They subsequently recovered to register a small increase in the third quarter before falling by 3.1% year-on-year in the fourth, ending up at 4.15Mt for 2020 as a whole.

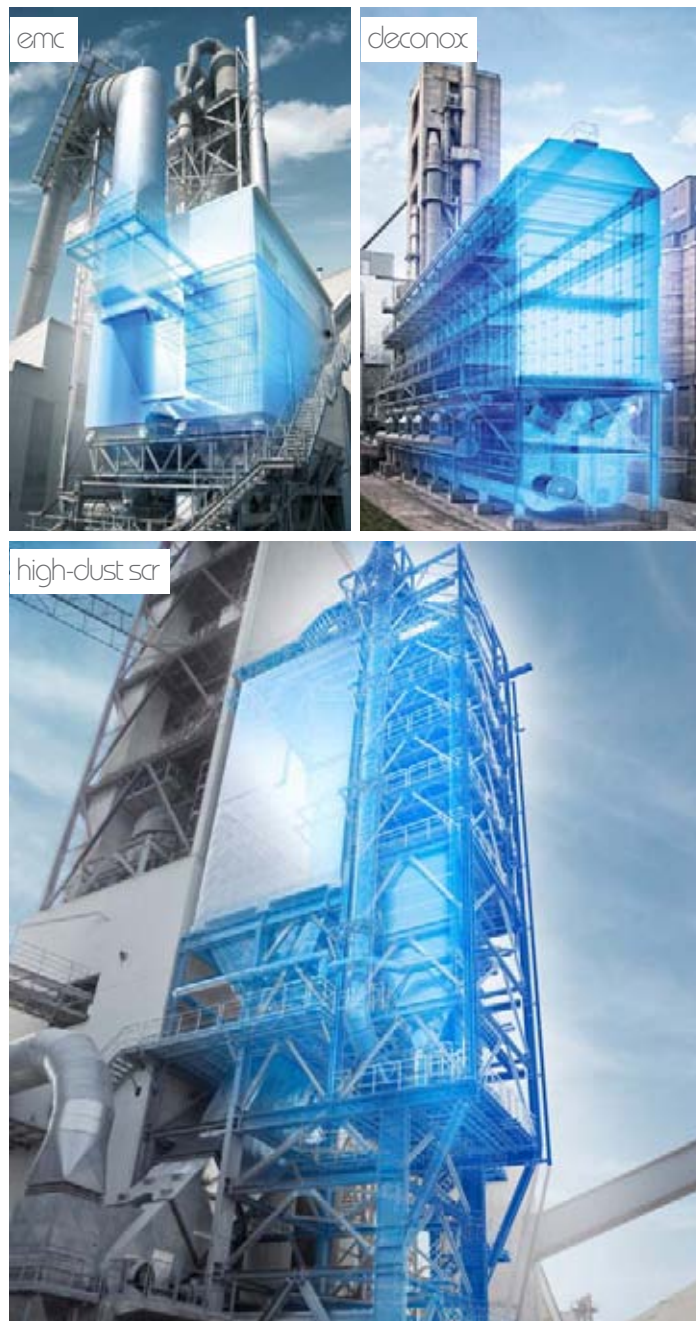
## Fuel trends

Swiss cement producers used alternative fuels for 68.1% of their thermal heating requirements in 2019. This is a marked increase compared to just 53.7% in 2014 (See Figure 6). The volume used, 353,903t, was the most ever consumed by the sector. Waste wood comprised the largest fraction, 18.7% (66,180t), with plastics (17.3%, 61,225t) and waste solvents (17.0%, 60,163t) the next most significant.

## Situation in 2020 and 2021

Switzerland, like Austria, managed to avoid the worst of the Covid-19 pandemic in the first half of 2020, only to succumb to a far larger second wave in the autumn. Its economy contracted by 6% across the year as a whole. For 2021, the IMF forecasts that the economy will recover some lost ground, gaining 3.6% year-on-year compared to 2020.

Of direct relevance to the cement sector, the Swiss Geological Survey (SGS) noted in December 2020 that, without extensions to raw material extraction licences, domestic cement production would be greatly hindered from 2024 onwards, with a potential reduction of as much as 36%. It said that producers are already restricted by limited legally-available limestone and marl reserves. At present the local cement sector provides 86% of Switzerland's 5Mt/yr domestic cement demand. The SGS states that acceptance of all proposed mining expansion projects in 2023 would delay the drop-off to 2030. 🌐



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Interview by Peter Edwards, Global Cement Magazine

## Lafarge Zement Mannersdorf: Pushing the limits



**Above:** Christopher Ehrenberg, Plant Manager at the Lafarge Zement Mannersdorf plant. An Austrian, Ehrenberg joined Lafarge in 2006, working at the Mannersdorf plant as a process engineer. After project experience in Central Europe and worldwide (from Canada to Japan), he became Plant Manager at the LafargeHolcim Čížkovice plant before returning 'home' to Mannersdorf as Plant Manager in January 2018. Since January 2021 he additionally took on the position of Industrial Manager for LafargeHolcim Central Europe.

We catch up with the exciting developments from LafargeHolcim's Mannersdorf plant in Lower Austria, which include plans for full-scale CO<sub>2</sub> capture and utilisation.

**Global Cement (GC):** Please could you outline the history of the Mannersdorf cement plant?

**Christopher Ehrenberg (CE):** The site of the Mannersdorf plant was first established as an industrial facility in 1894. The first rotary kiln for cement came online in 1904, with a series of wet kilns subsequently added. In 1968 the plant received its first dry line, kiln No. 8, a KHD four-stage preheater line with a capacity of around 0.8Mt/yr of cement. In 1984 we moved to a pre-calcliner system. In 2017 the relatively small separate line calciner was replaced by a large inline calciner to boost alternative fuel usage.

### Plant and process

**GC:** What is the production process used today?

**CE:** The current preheater from 1984 is a Parallel Air Serial Combustion (PASEC) system. It is rare because only a few were ever built by a joint venture between Voest Alpine Austria and the East German company Sket ZAB Dessau. The preheater has five stages with two strings. The gas flow is parallel but the material jumps from string to string - leading to better thermal efficiency, on the other hand causing high pressure loss. It was built in that way to bring down the specific heat consumption. The original design had an exhaust temperature of less than 300°C. With the changes that we have made to the line since then, including the introduction of

alternative fuels, the exhaust temperature is now slightly higher, around 330°C. This is also needed to cope with increasing raw material moisture.

The kiln's rated capacity is 2730t/day, which is around 0.9Mt/yr of clinker or 1.4Mt/yr of cement. To boost the use of alternative fuels and to improve the thermal efficiency a large inline calciner (ILC) with separate tower in front of the existing tower was erected 2016-2017. The ILC has a gas residence time of more than 7s. Our alternative fuel rate was boosted by this to above 90% on stable days, with 100% refuse-derived fuel (RDF) at the calciner.

The raw mill shop, partly still from the older KHD line from 1968, is the remaining bottleneck, especially due to increasing limestone moisture. This led to the decision to install a new vertical raw mill from Loesche, which will be commissioned in 2022.

**GC:** Where does the plant source its raw material?

**CE:** We have two quarries, one of which contains >95% CaCO<sub>3</sub> limestone and one of which contains clay. Between the limestone quarry and the plant is the town of Mannersdorf. The material is transported via belt through the town over a distance of 1.5km. The clay is from a clay pit located adjacent to the plant.

In 2005 we started to use our first alternative raw material, replacing the clay partly with recycled clay bricks. This is one of our most important

**Right:** View of the Mannersdorf cement plant across neighbouring fields.





### Plant profile: Lafarge Zement Mannersdorf

<b>Site established:</b>	1894
<b>Kilns:</b>	One - PASEC System - Commissioned 1984
<b>Design capacity:</b>	2730t/day (0.9Mt/yr) clinker 1.4Mt/yr cement
<b>Capacity today:</b>	2500t/day (0.8Mt/yr) clinker 1.2Mt/yr cement
<b>Raw mill:</b>	200t/hr roller press - KHD tandem mill
<b>Finish ball mills:</b>	60t/hr - FLSmidth 115t/hr - Krupp Polysius



**Above:** View of the kiln at the Mannersdorf plant.

contributions to recycling. Around 0.18Mt/yr of brick waste from end-of-life buildings in the Vienna area has now replaced almost two thirds of our natural clay demand. We mix natural clay in layers with the bricks and then 'excavate' the mixture, which acts as a 'raw' material.

Continuing with the flow, the material from the quarry, clay bricks and other materials are stored in the raw mix hall, which has a capacity of 40,000t. The current KHD raw mill system comprises a hammer pre-crusher with a roller press. The plant has two cement ball mills. One was produced by FLSmidth and it operates with a KHD roller press. The other is from Krupp Polysius with a third-generation separator. Our 10 cement silos have a total storage of 54,000t.

#### GC: What types of cement are produced?

**CE:** We produce nine types of cement at the Mannersdorf plant. The plant has a high share of CEM II cements and an average clinker factor of 67%. It makes around 15-20% CEM I, half of which is C<sub>3</sub>A-free, and 70% CEM II. The remaining 10% of our output is a concrete additive called Fluamix C.

In addition to the normal types of cement, we make a special C<sub>3</sub>A-free clinker called Contragress. This is used for applications that require sulphate-resistance and it is widely used in the Viennese market. The entire Vienna Metro system is made from Contragress-based concrete. Fluamix C has no clinker in it at all. It is used as an additive in concrete mixtures that may contain other types of cement.

#### GC: What fuels does the plant use?

**CE:** The plant began using alternative fuels in 1996, with animal meal and liquid fuels. Over time the plant has increased rapidly from 10% in 1998 to 27%

in 2000, 35% in 2002, 40% in 2004, 45% in 2010, 60% in 2012 and 85% in 2019. In 2020 this dropped dramatically due to a fire in the alternative fuel hall in June. Our current substitution rate is affected, but we will rise above 90% again later this year thanks to the installation of a new alternative fuels hall and feeding and dosing equipment.

A step change was the start-up of the inline calciner in 2017. This allowed us to saturate the calciner with coarse RDF without need of a control fuel. All RDF is dosed from the alternative fuel hall and docking stations, fed via tube conveyor and using a screw as an air lock into the calciner. On the main burner we use high grade RDF via satellite burner, solvents, waste oil and a small amount of petcoke.

#### GC: What fuels were used in 2020?

**CE:** Due to the fire 2020 was not a representative year. However, in 2019 we used on average 85% alternative fuels, with close to 100% on the best days. The calciner can now be saturated with coarse RDF and we only switch to petcoke in case of dosing disturbances. The main burner, representing 40% of the total, has a mix of high grade RDF, liquids, some waste tyres and a small amount of petcoke.

#### GC: How did the plant handle the change to a low level of alternative fuels?

**CE:** It was a strange situation, because no plant ever plans to drop from nearly 100% alternative fuels to a low level. The operators had to relearn how to use 90% petcoke and it was a *steep* learning curve. It felt like we were going back 20 years in time. We now have an intermediate solution and hope to commission the new Beumer / Schenck equipment incrementally over the summer of 2021. This shows the resilience of our excellent staff.





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

**CE:** For NO<sub>x</sub> control we had historically employed a selective non-catalytic reduction (SNCR) system. However, since 2012 and the installation of our semi-dust selective catalytic reduction (SCR) system from Scheuch, this has been employed only as a back up. The semi-dust SCR was the first SCR in Austria and among the first in the world. An ESP is used to dedust the preheater exit gas before two catalyst layers. The SCR, after some optimisation, enables us to achieve 200mg/Nm<sup>3</sup> in stable operation. An annual average of almost 200mg/Nm<sup>3</sup> could also be achieved, thanks to the lower raw NO<sub>x</sub> when running the inline calciner with RDF.

With respect to our dust emissions, we have a legal limit of 20mg/Nm<sup>3</sup>. However, we have self-limited to 8mg/Nm<sup>3</sup>. We communicate our dust emissions monthly along with other parameters like vibration levels from quarry blasts. We want to be really open and transparent because we have found that this creates trust between the plant and its stakeholders.

SO<sub>2</sub> emissions fell sharply in 2005 with the introduction of waste clay bricks to the process. We are at a very low level of SO<sub>2</sub> emissions. There is also continuous measurement of mercury, which began in 2011. When we installed the device, we began to see the spikes that happen when, for example, the raw mill stops. We use active carbon injection to counter these. We have a limit for total organic carbon (TOC), which we have always been able to adhere to comfortably. The SCR and large calciner have helped in this regard.

## GC: What projects are currently taking place?

**CE:** There are three large projects currently taking place at the plant. Firstly, the new vertical raw mill will replace the 53 year old raw mill shop from 1968. The VRM, a Loesche LM 45.4, will be erected parallel to the existing raw mill. This will represent a 'game-changer' for the plant and is very important for our continued development. The existing material dosing bins will be reused as well as raw meal transport and storage silos. The new mill is due to begin operations in February 2022, when the new raw mill will be connected to the material and gas stream during winter kiln stoppage. The existing kiln bag filter will also be re-used.

The new vertical raw mill will have a capacity of 275t/hr, removing the main bottleneck of today's kiln line. It will reduce significantly the electrical power consumption. In addition to raw mix, the vertical roller mill will be used in campaigns to grind limestone for cement. Separate grinding of limestone and mixing this into our base product will allow us to optimise our product portfolio even further and will reduce electrical power used for cement grinding too.

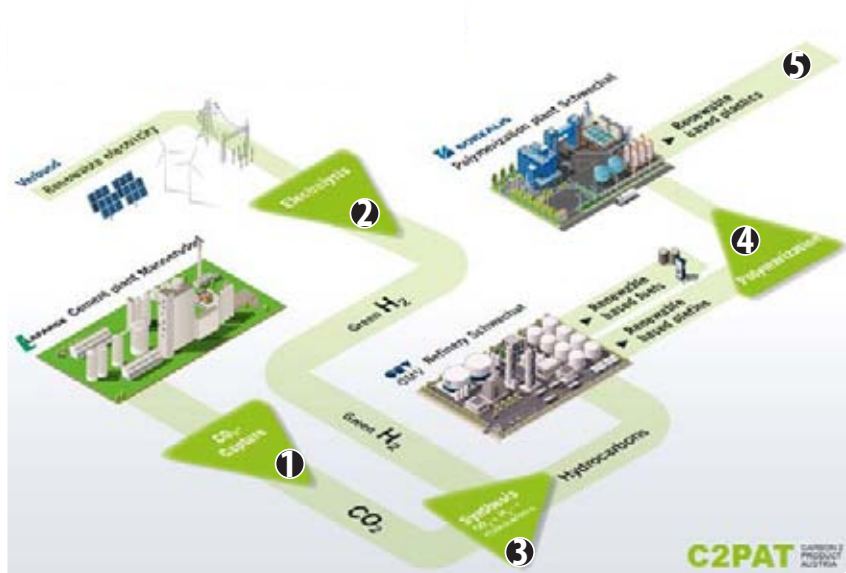
The second major project is the installation of a new RDF flash dryer, which is presently being erected. It is scheduled for commissioning in the summer of 2021 and is being supplied by A TEC. It will allow up to 6t/hr of main burner RDF to be dried before firing in a satellite burner. The reduction of moisture will improve the main burner flame, which will allow the plant to increase its RDF use further. The hot gas source for the flash dryer will be bypass exit gas from after the bag filter, or cooler exit gas after the electrostatic precipitator. The gas from after the flash dryer cyclone and filter will be re-introduced to the cooler fan inlet. This will destroy odors from RDF drying.

The third project is the reconstruction of the RDF hall, dosing and transport after the fire in June 2020, and is fully underway. Beumer and Schenck are installing equipment for extraction, dosing and pipe conveyors. Calciner RDF transport will be provided by a 195m-long Beumer Pipe Conveyor. RDF will be sourced from two identical 50m<sup>3</sup> dosing bins on the calciner pipe, in addition to one dosing from a docking station. The main burner RDF will be stored in a separate box in the hall and fed by the crane to a 50m<sup>3</sup> bin. It will be dosed to the main burner via a second Beumer Pipe Conveyor. Hall, dosing and conveyors will be equipped with a state of the art fire detection and extinguishing system. Start up will be in steps - full operation with automatic crane and all dosing lines will be attained in the autumn of 2021.

**Below - Figure 1:** C2PAT project overview.

1. CO<sub>2</sub> capture unit;
2. Electrolysis to produce green hydrogen;
3. New synthesis route for methanol production;

4. Methanol-to-propylene unit, to be integrated into OMV's refinery;
5. Renewable-based plastics will be produced at Borealis' polymerisation unit.





## C2PAT Project

**Joseph Kitzweger, Director of Sustainable Development, LafargeHolcim Austria (JK):** The Mannersdorf plant is involved in a huge CO<sub>2</sub> capture and utilisation (CCU) project known as Carbon-2ProductAustria (C2PAT). In this project, we aim to demonstrate a novel, first-of-its-kind cross-sectoral circular carbon value chain on an industrial scale. CO<sub>2</sub> from cement production will be captured and combined with renewably-generated hydrogen to produce a feedstock for chemical processes. This will be converted into renewable plastics and fuels.

With our partners OMV (refinery), Verbund (renewable electricity provider) and Borealis (chemical and plastics producer), we will integrate and operate different technologies that will be combined into one novel holistic value chain (Figure 1). LafargeHolcim was the leading force in the formation of the consortium. We contacted the other partners, each of which was keen to join us due to different motivations. Plastics and refineries will have to adapt to a fossil fuel-free world in the coming decades and renewable power will come in to fill the gap in power generation that opens up.

The key innovation is using CO<sub>2</sub> emissions from cement production as a feedstock for petrochemicals - an integrated and cross-sectoral approach. C2PAT also demonstrates a circular economy approach in the cement and chemical sector given that renewable based plastics can be recycled and reused in various recycling streams. The 'cherry on the cake' in this CO<sub>2</sub> cycle is the fact that the main fuel in the Mannersdorf plant is already waste plastic. The CO<sub>2</sub> it emits is then captured and converted back into plastic!

### GC: What is the time-scale for the C2PAT project?

**JK:** A demonstration plant to capture and process 10,000t/yr of the plant's CO<sub>2</sub> emissions is currently in the planning and engineering phase. It will be in operation in 2024. This stage will generate new know-how to achieve the next step, a full-scale plant capable of converting almost all of the Mannersdorf plant's 0.7Mt/yr of CO<sub>2</sub> emissions into renewable-based hydrocarbons. We anticipate this will be operational by 2030 at the latest.

### GC: Could the C2PAT hydrocarbons be used in the cement kiln?

**JK:** Hydrocarbons, produced from our plant's CO<sub>2</sub>, could be refined into any fuel, potentially one for a cement kiln. However, in the net zero-CO<sub>2</sub> future it will make sense to replace those fuels that are most difficult to decarbonise, such as kerosene for aircraft.

### GC: Why was this plant chosen for this project?



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**Above:** Construction of the new alternative fuels hall.

**CE:** The Mannersdorf plant was chosen for the C2PAT project because it has a long track record of very high-level and increasing technical performance. We had shown that the plant would handle the project well and extract the most value for the wider group. The workforce is very proud that their plant has been selected. It is a testament to their hard work and expertise.

## **GC: What is the biggest challenge for C2PAT?**

**JK:** I would say that the biggest issue is that decision makers, at both the national and European levels, need to understand the urgency to provide high capacities of renewable energy sources, e.g.: wind and solar. In the longer term Europe's power will need to come from large photovoltaic farms in the south of Europe and wind power further north. There have to be systems to transport the resulting power itself or the renewable hydrogen, as well as exhaust CO<sub>2</sub>, with places to store all of these things.

There are also issues around accelerating the permitting process. For example, if you decide today to build a wind farm in Austria, the earliest you can start is 2029. There's also the NIMBY effect. Everyone wants to sign up to a renewable power tariff, but nobody wants wind turbines in their back yard!

There also needs to be further development of the market for low-CO<sub>2</sub> cement products. We would argue that this should include an EU-wide legislation that promotes the use of such products, e.g. starting with public construction projects.

We need to get on with this! I always say there are three decades to 2050, the year by which Lafarge-Holcim wants to achieve net-zero CO<sub>2</sub> emissions. The 2020s are for demonstration, the 2030s will be for scale-up and the 2040s will be for wider roll-out.

## **Markets and Future**

### **GC: Where are the plant's main markets?**

**CE:** Mannersdorf plant is located 40km south east of Vienna, which is our main market. We also supply Lower Austria, Austria's largest Federal State. We also export cement to Hungary and Slovakia.

### **GC: How were the plant's markets affected by the Covid-19 pandemic?**

**CE:** Although Austria has experienced several lockdowns, there has been only a minor impact within the Austrian construction industry, our core market. The plant has been able to run almost uninterrupted. We lost two weeks of sales in spring 2020 but after that, sales took off like a rocket. We produced just shy of 1.2Mt over the course of the year.

At the plant level, we offer lateral flow tests on Monday and Friday for all staff, which come back with results in 30 minutes. Such tests provide early detection of the virus and guard against widespread outbreaks.

### **GC: How have the recent changes to the EU ETS price affected the plant?**

**CE:** The rising ETS price, which hit more than Euro40/t in March 2021, only serves to accelerate our decarbonisation efforts, as well as challenge our cost structure. The main focus areas are thermal efficiency and state-of-the-art production facilities for a CO<sub>2</sub>-reduced product portfolio and circular economy.

### **GC: What are your current expectations for the market in 2021 and beyond?**

**CE:** Although the European Commission is forecasting the second weakest economic growth in the EU for Austria, we are cautiously optimistic. There are some infrastructure projects in the pipeline, including several tunneling projects and the expansion of the Viennese Underground. Our major customers signal well filled order books.

### **GC: What is the biggest challenge for the plant over the next five years?**

**CE:** There are several big challenges for our plant in the near future. One will be how the EU ETS price develops in the future. We continue to work on a CO<sub>2</sub>-reduced cement portfolio in order to achieve our sustainability goals. Sustainable cements *will* be more expensive. Our customers will have to take this into account in the longer term. The next

**Opposite Page:** A new A TEC Flash Dryer for drying RDF for the main burner, further decreasing the amount of coal or petcoke required while lowering CO<sub>2</sub> emissions.





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big challenge will be the low availability of mineral components and additives, which is already noticeable due to stagnating production of our suppliers, for example the steel industry. Of course, we are also noticing a strong trend towards other building materials, such as wood, in the sustainability discussion. It's up to us, to position concrete in sustainability schemes like BREAM, LEED, DGNB, etc. in the right way so that the inherent advantages of the product can be conveyed to as wide an audience as possible.

**GC:** What is the biggest opportunity over the same time-frame?

**CE:** This is, for sure, the C2PAT project. With the realisation of the full-scale plant by 2030, we will be able to almost eliminate CO<sub>2</sub> emissions from the plant and reposition CO<sub>2</sub> as a valuable raw material.

**GC:** Thank you for your time today.

**CE:** You are very welcome indeed.





## Mexico: Cemex sales rise by 2%

Cemex recorded consolidated cement volumes of 63.8Mt in 2020, up by 2% year-on-year from 62.7Mt in 2019. Ready mixed concrete sales volumes fell by 6% to 47.0Mm<sup>3</sup> from 50.1Mm<sup>3</sup>. Its net sales fell by 1% to US\$13.0bn from US\$13.1bn although the group has reported a slight rise on a like-for-like basis. Operating earnings before interest, taxation, depreciation and amortisation (EBITDA) rose to US\$2.46bn, up by 3% from US\$2.38bn. However, sales and earnings picked up significantly in the fourth quarter of 2020.

Cement volumes rose by 6% in Mexico and by 8% in the US, but fell by 1% in Europe, the Middle East, Asia and Africa and by 8% in South and Central America and the Caribbean. Prices fell in all regions except Europe, where they rose by 3%, and the US, where they remained level. Annual like-for-like sales and gross profit increases were noted in Mexico, the US and the Middle East and Africa.

## Jamaica: Caribbean Cement sales rise by 13%

Caribbean Cement's revenue grew by 13% year-on-year to US\$134m in 2020 from US\$119m in 2019. Operating earnings rose by 32% to US\$42m from US\$28.8m. The subsidiary of Mexico-based Cemex said that the increase in revenue was related to stronger domestic demand and the company's capacity to supply the local market.

## Mexico: Cemex fired up on hydrogen

Cemex plans to start using hydrogen as part of its fuel mix at its cement plants around the world in 2021. The estimated cost of the roll-out is US\$40m. The company says it completed the deployment of its hydrogen technology across all of its cement plants in Europe in 2020 following trials at the Alicante Cement Plant in Spain in mid-2019.



## Mexico: Elementia sales rise in 2020

Elementia sold 5.3Mt of cement in 2020, up by 4% year-on-year from 5.1Mt in 2019. Its consolidated net sales rose by 8% to US\$1.34bn from US\$1.24bn, while earnings before interest, depreciation, taxation and amortisation (EBITDA) rose by 8% to US\$170m from US\$157m. Cement business sales rose in all regions with the exception of Central America, with particular earnings growth recorded in the US.

The company also noted that the sale of its integrated Bath plant in Pennsylvania, US remained under review by competition authorities with a response hoped for in April 2021. The sale of the unit to HeidelbergCement-subsiary Lehigh Hanson was first announced in September 2019.



## Peru: Pacasmayo sales slide by 7%

Cementos Pacasmayo recorded sales of US\$354m in 2020, down by 7% year-on-year from US\$381m in 2019. Consolidated earnings before interest, taxation, depreciation and amortisation (EBITDA) fell by 21% to US\$86.3m from US\$110m. Sales volumes of cement, concrete and precast shipments fell by 1% to 2.58Mt from 2.61Mt. Cement production capacity utilisation was 45%, down by 2% from 47%. In the fourth quarter of 2020 cement dispatches rose by 37% year-on-year.

Global operations, technical and energy vice-president Roberto Ponguta said "The fast adoption of this new hydrogen-based technology is a clear example of Cemex's innovation efforts and its strong commitment to decarbonise the cement production process." He added "We continue to identify and deploy existing technologies which have a high potential to contribute to our sustainability goals. Hydrogen is a key lever."





## Chile: Green Melón power deal

Melón has signed an electricity supply contract with Enel Generación. The contract covers the supply for its La Calera, Puerto Montt and Ventanas cement plants and its San Bernardo aggregates quarry until 2043. 100% of the power supplied under the contract will come from renewable sources. There is also the possibility of expanding the scope of the contract in the future, with the company currently scheduling the commissioning of its Punta Arenas grinding plant in the extreme south of Chile, for the second quarter of 2021.

The Punta Arenas plant, at the heart of which is a Plug&Grind Xtreme modular grinding mill from Spain's Cemengal, is budgeted to produce 80,000t of cement during its first 12 months of operation, with an intended subsequent capacity of 0.25Mt/yr. The plant may also be expanded to 0.5Mt/yr in the future should demand require it.

Regarding the renewable energy deal, Melón's General Manager Iván Marinado said "Our commitment to the sustainability of our operations is permanent. We have state-of-the-art technologies, we work together with our carriers in programmes to reduce logistical impact and energy efficiency, and we have a solid co-processing strategy for the use of alternative fuels and raw materials. Today we are happy to take a new step and start the use of renewable energies, as a concrete and effective example of our concern to contribute to the environmental improvement of the localities in which we operate."

## Dominican Republic: Cemex to restart 0.5Mt/yr San Pedro de Macorís line

Cemex Dominicana plans to recommission line 1 at its 2Mt/yr integrated San Pedro de Macorís plant. The move is expected to increase its existing clinker production capacity by more than 0.5Mt/yr. The re-activation is scheduled for the fourth quarter of 2021 and is part of Cemex Dominicana's growth plan, in which it seeks to strengthen its capacity in response to both local market demand and exports.

"At Cemex Dominicana, we reiterate our commitment to the sustainable development of the Dominican Republic, in the context of boosting the national economy, aiming with these investment plans to reduce the need for imports, promote local industry and contribute to the generation of employment in the country," said José Antonio Cabrera, Director of Cemex Dominicana.



Image: The San Pedro de Macorís plant.  
Source: Cemex Dominicana.

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Interview by Peter Edwards, Global Cement Magazine

## In discussion: Mike Ireland, PCA President & CEO

*Global Cement* speaks with the Portland Cement Association (PCA) President & CEO Mike Ireland about the association's recent achievements, its sustainability commitments and hopes for the Biden Administration.



**Above:** PCA President Mike Ireland.

**Global Cement (GC):** How has the US cement sector been affected over the past 12 months?

**Mike Ireland (MI):** I am fortunate enough to work with cement company CEOs, their skilled staff and those in the wider global cement industry. By pulling together, they have all helped our industry register some incredible achievements against the background of what has been a very difficult period for the entire world. In the US we also dealt with a very trying election year and related political and social disruption.

The US cement industry suffered in 2020 due to the pandemic, but by working together our safety, education, and collaboration programs helped keep life-loss to a minimum. However, like the products it produces, the sector was resilient, with surprisingly little disruption. Our forecasters were extremely busy providing ongoing advice to our members on a weekly basis early in the pandemic, which certainly helped them to navigate this difficult period. *See more on economics and forecasting on Page 54.*

**GC:** What were PCA's main achievements in 2020, against this difficult backdrop?

**Below:** PCA is optimistic that the Biden Administration will deliver meaningful infrastructure investment.



**MI:** Early on in the pandemic, PCA, its members and allies were able to contribute to the successful classification of cement and concrete as 'essential industries' at both Federal and local levels, which provided a license to operate. We continued to collaborate with our concrete sector partners to find ways to promote our products, with more than 30 webinars on salient subjects like cement plant safety during a pandemic. This helped on the safety side primarily, but also on the production side, because it gave plant operators and their staff the confidence to continue to work.

However, I would say most important for PCA in the midst of the pandemic was that the CEOs came together to speak as one voice and develop a long-term focus on a long-term strategy for the cement sector in the US. This was along three lines: Sustainability, infrastructure and market development. We have worked out communications strategies, both internal and external, for our plans regarding these three points.

One that readers may already be familiar with is the Ambition Statement for the US cement sector to achieve climate neutrality across the concrete value chain by 2050. The first step in this is the creation of a Roadmap, which has been in development since late 2020. It is expected to be approved by PCA leadership by the end of the third quarter of 2021. This will show the steps required and levers we will pull to achieve this goal.

As part of this, PCA has spoken to CEMBUREAU, the European Cement Association, about the development of the European roadmap. The major carry-over is the appearance of the 5Cs approach, namely reduction of emissions from: clinker, cement, concrete, construction and built environment and (re)-carbonisation. We have also been coordinating the development of the Global Cement & Concrete Association's global roadmap.

**GC:** What conclusions has PCA come to so far regarding its own roadmap?



**MI:** It is clear that cement is the single most significant part of the concrete value chain that gives rise to CO<sub>2</sub> emissions. Therefore a lot of the onus to reduce emissions will fall on our sector. That makes it clear, from where I'm sitting, that CO<sub>2</sub> capture and utilisation / storage (CCUS) will be a major part of our sector's efforts towards climate neutrality. Of course, we will also have to work with our other partners to reduce emissions across the board.

**GC:** How will the US roadmap be different from those that have come before?

**MI:** The process of making cement, putting it into concrete and constructing buildings is not hugely different between different countries, so the main levers that have to be pulled are common.

The incentives to reach our goals will differ from other parts of the world. For example a tax on emissions akin to the EU Emissions Trading Scheme (ETS) would not go down well here. Instead, tax breaks can be a good way to incentivise sustainable practices. Look at the 45Q tax credit for CO<sub>2</sub> capture. It pays US\$20/t of CO<sub>2</sub> permanently sequestered and US\$10/t used in enhanced oil recovery. This has already spurred a number of CCUS projects. Looking ahead, I think there is an opportunity for us to work with politicians, specifically the Department for Energy, to accelerate the development of all of the levers we need.

**GC:** What could be the cost implications of full-scale CCUS across the US cement sector?

**MI:** The costs of these measures will have to be shared along the concrete value chain and society as a whole. Cement producers generally have small margins and they cannot be expected to take on the entire cost burden single-handedly. The goal of sustainability is a common one. There is no real alternative for cement and concrete as a strong, ubiquitous, inexpensive and durable building material. It is also the best material that will help us stand up to the challenges of climate change. I think there is a strong argument that mankind will be unable to survive meaningfully in the future *without* concrete.

**GC:** How is PCA acting to improve the public perception of concrete?

**MI:** We are in the process of restarting the launch of our Shaped by Concrete campaign, which was initially launched in January 2020. This was paused due to the onset of



**Above:** The US has endured a very tough time throughout the Covid-19 pandemic.

the pandemic in March 2020. Due to the very busy summer and autumn news cycle with Covid-19, the election season and social unrest, we decided to wait until 2021 to restart the roll-out, which is now ongoing. This will bring our stance - that cement and concrete are the sustainable materials of the future - to the attention of a wider audience. For example, the recarbonisation of concrete during use doesn't garner enough attention and that's something PCA wants to change. Research indicates that the CO<sub>2</sub> reabsorbed over the lifetime of a building can be as much as 20-25% of the CO<sub>2</sub> originally emitted during its production.

Once we get to the point where the sector is net CO<sub>2</sub> neutral and then it starts to take up CO<sub>2</sub> from the atmosphere, it would become a CO<sub>2</sub> sink, almost like a forest. This would be a truly amazing transformation. There's no other material that could do this job! It's really exciting for the sector and it is great to be starting on this journey.

**Below:** Ireland says that alternative fuels probably represent the lowest hanging fruit for the US cement sector to reduce its emissions.







**GC:** How has PCA's relationship with other building materials associations developed over the past 12 months?

**MI:** Relationships with the associations that cover other parts of the construction industry have become even stronger over the past 12 months. We are heading up the American Concrete Alliance and have taken on some of its back-office tasks. We completed construction of a brand new office building in Washington DC in the second half of 2019 that is intended as a space for PCA and its partners. Of course this has been mostly empty to date. Hopefully that situation will change soon.

We are also part of the Highway Materials Group. This even includes representatives from the asphalt group, a traditional competitor to our sector. We share back-office staff with this group and other associations. This makes each association more effective at doing the things that actually make a difference to their members.

On the international front we are an associate member of the GCCA, with whom we meet digitally on a regular basis and share best practice. There will be more opportunities for deeper collaboration in the future, particularly regarding the sustainability roadmaps we discussed earlier.

**GC:** How is the PCA dealing with the remote-working aspect of the pandemic?

**MI:** Like everyone else, we have been working extensively from home and online. Unfortunately we were forced to cancel the annual IEEE-IAS/PCA Cement Industry Technical Conference in 2020 and have converted the 2021 edition into a virtual event. We are able to function without physical meetings

but you cannot recreate those little bits around the edge of a real-world conference that add that extra layer of value. There can be no unexpected meeting in the lift, off-the-record bar chat or other opportunity to properly 'take the pulse' of the sector. People need that real-world connection. I hope we can get back to these soon. We currently have a real-world event scheduled for the third quarter of 2021.

**GC:** What does PCA hope to see from the Biden Administration?

**MI:** PCA hopes that the incoming Biden Administration will continue to enhance funding, research and infrastructure for CCUS to help the sector significantly reduce CO<sub>2</sub> emissions. Government incentives will be crucial to developing this technology. I think that we are now at the point where the 'capture' part is sorted. That's because it can be controlled by the plant. It's the 'utilisation' and 'storage' parts that will need external help, not just for our sector, but for all industrial sectors that emit CO<sub>2</sub>. A major part of this will be new Federal pipelines, not for oil or gas, but for CO<sub>2</sub>.

The Federal Government will have to enact procurement policies and incentivise the development of lower-CO<sub>2</sub> cements. We know you can get a 10% emissions reduction just by using portland limestone cement. This is a low-hanging fruit! The new Administration can also help by lowering the barriers to the use of byproducts from other sectors, for example coal combustion and the steel sector, which provide some of the lowest-cost short- to medium-term opportunities to reduce CO<sub>2</sub> emissions from our sector.

**GC:** How do you think the relationship with the US Environmental Protection Agency (EPA) will develop under Biden?

**MI:** When you have a change of US Administration anyone dealing with government departments is liable to suffer whiplash. That said, our relationship with EPA has been collaborative and strong under both of the previous administrations. President Biden has signed executive orders that seek to address climate change and environmental justice. We see the cement sector as a solution to these challenges rather than a problem and we look forward to working with the Administration, EPA and other government departments towards this goal.

**GC:** You mentioned some of the low-hanging fruit just above in terms of supplementary cementitious materials. What low-hanging fruits can be found on the alternative fuels side?



**Right:** Upgrading an Interstate Highway close to Phoenix, Arizona, something PCA hopes to see more of in the future.



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## GLOBAL CEMENT: INTERVIEW



**MI:** It is no secret that the US is, in some ways, behind other major cement producers in terms of waste processing and the use of alternative fuels, which probably represent the *lowest* hanging fruit for our sector. The PCA needs to be enthusiastic when speaking to EPA, decision makers, the public and other stakeholders about this subject. We will have a hard time cutting through the well-funded landfill lobby, but there are major opportunities in this area.

**GC:** What is the biggest threat to PCA members in the next 1-5 years?

**MI:** In the short- to medium-term the biggest obstacle is Covid-19 and how our country handles the rise of any new variants amongst its population. The fundamentals of our sector are otherwise fairly strong.

**GC:** What is the biggest opportunity over the same time period?

**MI:** There is a great need for infrastructure renova-

tion in the US and I am more optimistic than I have been in a long time that the current Administration will be able to address that. We are confident in President Biden's ability to not politicise this issue too much and to reach across the aisle to get things done. There is not only the need, but it's also a big job generator that could really help the country as it moves out of the pandemic.

For its part PCA will continue to press for a well-funded long-term Surface Transportation Authorisation Bill and the continued solvency of the Highway Trust Fund, with an emphasis on low-CO<sub>2</sub> concrete. MIT has also shown that concrete surfaces save 2% of vehicle CO<sub>2</sub> emissions during use compared to asphalt and they reflect, rather than absorb light, reducing the urban heat island effect. So a major commitment to surface transportation would be a major boon to our sector. Our percentage of the pie will be as large as it is normally, regardless of the size of the pie. Better to have a pie than no pie at all.

**GC:** Thank you for your time today.

**MI:** A pleasure as always!





Interview by Peter Edwards, Global Cement Magazine

## In discussion: Ed Sullivan, PCA Chief Economist

*Global Cement caught up with the Portland Cement Association (PCA) Chief Economist Ed Sullivan following a turbulent year in the US cement sector.*



**Above:** Ed Sullivan, the PCA's Chief Economist.

### **Global Cement (GC): What were the effects of Covid-19 on the US cement sector in 2020?**

**Ed Sullivan (ES):** The first quarter, when the pandemic was yet to hit the US, was an incredible quarter for the nation's cement sector, with 10% year-on-year growth compared to the first quarter of 2019. Order books were brimming and times were good. But then Covid-19 hit. In the second quarter of 2020 the pandemic hit the US extremely hard. It battered the economy and forced shutdowns at some cement plants. This gave rise to the sharpest quarter-on-quarter drop in economic activity ever seen in the US.

However, this did not affect the cement sector, which was deemed an essential industry, to anything like the same extent. Indeed, by the time the third and fourth quarters had rolled around, 2020 as a whole recorded an overall 1.6% net *gain* year-on-year in cement consumption compared to 2019, hitting more than 100Mt for the first time in seven years. This, to me, is truly remarkable.

So how and why did this happen? A couple of things we have to realise is that there is a lag between what happens in the economy, which was badly affected in 2020, and actual amount of cement demanded by jobs on the ground. When there is economic disruption, it is not the jobs that were

approved 6-12 months ago that are delayed, it is those coming in the following 6-12 months, possibly even longer. This allowed the cement sector to at least appear to 'beat Covid' in the second half of 2020.

If we look more deeply, two other things also happened. To preserve economic growth, the Federal Reserve stepped in and lowered interest rates, leading to lower mortgage rates. This led to an 8% year-on-year gain in single-family home starts in 2020 compared to a year earlier. Additionally, public infrastructure works at the State level also held up well, in fact the amount of cement demanded by these increased year-on-year by 2%. It was on the non-residential side, i.e. commercial buildings that we saw what we would expect, an 8% decline.

Particularly surprising was the acceleration in demand in the final two months of 2020. Cement production in November 2020 rose by 6.6% year-on-year and in December 2020 the increase was 11.5%. These are 'head-scratchers' because at the same time there was a resurgence of Covid-19 infection rates. It is possible that favourable winter weather, which didn't turn until the start of the new year, raised demand in both of these months, but this effect would not normally be so strong.

### **GC: What regional trends were seen in 2020?**

**ES:** You can look across the US and see 'winner' and 'loser' States in terms of cement production in 2020. Central portions of the US, especially more sparsely-populated ones that did not see the extreme Covid-19-related death rates typical of densely-populated coastal areas such as New York, fared better in terms of cement consumption because day-to-day life was less affected by the pandemic.

Another factor that was seen is that energy prices plummeted, leading to lower use of oil well cement in many States, for example in Texas and in North and South Dakota. These factors overlapped across the country, creating a somewhat confusing pattern.

**Below:** Massive interchange in Los Angeles, California. The US needs significant infrastructure investment.







**GC: Where do you think 2021 is headed at this point?**

**ES:** For 2021, there is the risk that the economic turbulence experienced in 2020 will filter through to parts of the construction sector that were previously unaffected. We don't currently think that this will result in a contraction overall in cement demand, but consumption will not grow as quickly as the performance of the overall economy might appear to suggest. When we talk to our members' sales and marketing representatives in the field, we hear that order books are already starting to wear a little thin.

We currently expect around 1% growth in cement consumption across 2021, although in the Covid-19 era this is an ever-moving target. Even compared to December 2020 things have changed. For example, we are seeing that the vaccination programme in the US, although it is gaining pace, will not support our earlier assumptions of a return to 'normality' in the third quarter.

That said, our observation of the trend in November and December 2020, when infection rates were rising alongside higher cement consumption, means that even our assumptions have huge asterisks attached to them at this point. It could be that a slower-than-expected vaccine rollout, a new variant, or other resurgence of the virus could have limited or even zero correlation to cement consumption. It is difficult to be a forecaster right now!

**GC: How has the pandemic affected the banking sector. Could there be a Covid crunch?**

**ES:** The economy is still very weak and the Federal Reserve has, as I mentioned earlier, stepped in to steady the ship with a very accommodating reduction in interest rates. This has led to an uptick in housing starts, encouraged new mortgages and led to a 17% rise in home affordability compared to 2018 levels. You can now get a mortgage with a 3% deposit.

On top of this, there are a lot of businesses out there that remain shuttered or, if they are not shuttered, have lost significant sales and may be in financial difficulty. Many have debt obligations to service and, if left unchecked, this could lead to a significant commercial credit crunch. Part of the Covid Relief Bills have staved off some of these risks but they remain in the background.



**Left:** A number of factors could lead to a Covid-crunch in the coming years.

Additionally, a factor that is shared across the globe, is that the economy needed serious support. We now talk about spending a trillion dollars here and a trillion dollars there, like it's pocket money. We have seen a massive increase in Federal Debt levels so that nearly 15% of every Federal tax dollar currently goes to servicing debt.

Put together, the potential for a credit crunch is therefore not something that happens immediately in the next 6-12 months, but it may hit us once the pandemic is in the rear view mirror. In the longer term interest rates will rise, forcing slower growth. This could come back to haunt us in 2024-2025.

**GC: What are your medium-term expectations for cement demand in the US?**

**ES:** As I mentioned, we expect around 1% growth in demand in 2021 compared to 2020. Growth will speed up slightly in 2022 and then there will be more significant growth in 2023, when we expect a

**Below:** Cement and concrete demand was surprisingly resilient in the US during 2020.







**Above:** Population trends, while uncertain, are one of the easier-to-predict variables in long term cement demand forecasts.

major Infrastructure Bill to come into play. While we are unsure of the scale of this, we currently have a placeholder of US\$260bn to be spent over 10 years. If realised this would require steady and sustained growth in cement consumption.

By 2025 we expect cement consumption to be around 111Mt. Even this would still be down some 16Mt compared to the historical peak of 127Mt seen in 2005. This is what we are confident to advise our members at present.

Questions remain as to whether President Biden will be able to fund such a large Infrastructure Bill, so it may have to be scaled down a little. The Republicans could really hold his feet to the fire if he fails to deliver.

**GC: How are imports affecting the US cement sector at present?**

**ES:** Over the past couple of years imports have held at around 16Mt, around 16% of the market. Domestic utilisation rate is hovering around 81% across the country. We will not see either of these levels shift greatly unless we see a large increase in demand, and I certainly don't think they will change in 2021 or 2022. Typically as utilisation rates increase, imports rise. A rising tide lifts all ships!

**GC: What could be the potential impact of a US-wide tax, trading scheme or other measures that aim to reduce industrial CO<sub>2</sub> emissions?**

**ES:** This is something that could happen in the coming years in the US and, as PCA, we are ready, willing and able to take on the challenge of reducing our emissions, to net zero by 2050. However, in the event of a system that applies only to US-based installations, there is the risk of carbon leakage. This is where the financial penalty of emitting CO<sub>2</sub> in a trading scheme leads to lower-cost imports from

countries not bound by the scheme, with zero reduction, or even a possible increase, in overall emissions.

At PCA, we are looking at the possible economic fallout from such outcomes. We would advise that what should happen, from the outset, is an adjustment mechanism that applies the same burden to imported cement as domestically-made cement. Then the playing field would be level.

**GC: What is your current estimate for US cement consumption over the longer-term?**

**ES:** The main driver of cement consumption in the US is, as elsewhere, its population. For the US, the main driver of population growth is not domestic growth, but immigration. We use population forecasts from the Census Bureau to assess likely future trends, with a current estimate of 150Mt of cement in 2040.

**GC: Have the more lenient policies of the incoming Biden Administration affected that estimate?**

**ES:** While the immigration policies are now not as tough as before, they are not expected to alter the pre-existing trajectory of the US population to a great extent, certainly not in the 20 year timeframe. Indeed, they may also be short-lived.

**GC: What other trends is PCA watching going forward?**

**EC:** The Covid-19 pandemic sped up several developments that were already in motion, particularly e-retail and working from home. Both trends will affect cement consumption going forward. If there are fewer commuters, the pressure on the roads is lower and the need to expand a particular highway may not be as acute. If bricks-and-mortar retail fails to bounce back from the pandemic, we can expect lower investment in shopping malls and associated facilities. If online meetings replace a trip across the country, the demand on airports will also be lower. We now include these kinds of effects in our forecasts and we are keeping an eye on how we can model these going forward.

Finally to return to CO<sub>2</sub>, concrete is a material that should see increased use in a carbon-constrained world due to its resilience in the built environment. This will push cement demand back up, in the opposite direction to the factors I mentioned in the first part of this answer. Quite where we end up is an unknown at this point, but it will be very interesting to find out.

**GC: Ed Sullivan, thank you for your time.**

**ES:** You are welcome as always!



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## China: Anhui Conch sales fall in 2020

Anhui Conch Cement recorded consolidated sales revenue of US\$27.0bn in 2020, up by 12% year-on-year from US\$24.0bn in 2019. Its net profit rose by 5% to US\$5.38bn from US\$5.14bn. The company said that its total assets were US\$30.8bn in 2020, representing an increase of 12% from the end of 2019.

## Pakistan: Sales rise in first eight months

Members of the All Pakistan Cement Manufacturers Association (APCMA) recorded cement sales of 38.0Mt in the eight-month period ending on 28 February 2021 – the first eight months of its 2021 financial year – up by 14% year-on-year from 33.3Mt in the corresponding period of the 2020 financial year. Local press reports that exports rose by 7% to 6.33Mt from 5.94Mt while local dispatches rose by 16% to 31.6Mt from 27.4Mt. The association said that producers face problematically high costs due to rises in coal and energy prices.

## India: ACC sales rise despite Covid-19

ACC's net sales fell by 12% year-on-year to US\$1.85bn in 2020 from US\$2.11bn in 2019. Its earnings before interest, taxation, depreciation and amortisation (EBITDA) dropped by 3% to US\$341m from US\$332m. Cement sales volumes decreased by 12% to 25.5Mt and ready-mixed concrete sales volumes by 36% to 2.3Mm<sup>3</sup>. The subsidiary of Switzerland-based LafargeHolcim said that its cost efficiency program and working capital optimisation helped it to grow earnings and profits in 2020 despite the coronavirus pandemic.



Image: Cement delivery in Malaysia.  
Source: Ekahardiwito / Shutterstock.com.

## Pakistan: New plant for Kohat Cement

Kohat Cement Company Limited has approved plans to establish a 7800-10,000t/day integrated cement plant at Khushab, Punjab. The company will also set up an 8-10MW waste heat recovery (WHR) plant and a 25MW coal-fired power plant at the site. The total estimated cost of the project is US\$189m. The producer will raise finances through a mix of debt and equity. Commissioning is scheduled for mid-2023.

## Australia: Adbri income falls in 2020

Adbri's revenue fell by 4% year-on-year to US\$1.15bn in 2020 from US\$1.20bn in 2019. Underlying earnings before interest, taxation, depreciation and amortisation (EBITDA) decreased by 3% to US\$216m from US\$222m. Despite construction growth in Western Australia, cement volumes were reported as being down by 7.1%. The company said that clinker volumes dropped by 23% due to lower offtake by its Sunstate Cement joint venture partner Boral. It added that the impact of the coronavirus pandemic had been 'well managed' and that all sites remained operational.



## Australia: James Hardie sales rise

James Hardie recorded net sales of US\$2.10bn in the first nine months of its 2021 financial year, up by 9% year-on-year from US\$1.93bn in the first nine months of its 2020 financial year. Adjusted earnings before interest and taxation rose by 25% to US\$456m from US\$366m. Sales and earnings increased in all three regions in which the company operates. In Australia and New Zealand, it reduced costs by consolidating fibre cement production at its two Australian plants.

## Kazakhstan: Production rises

Kazakhstan's cement production increased to 10.8Mt in 2020. Kazakhstan Newswire has reported that 2020 is the first year in which domestic cement production has exceeded 10Mt. Capacity utilisation across the nation's 16.5Mt/yr of installed cement capacity was 66%.

HeidelbergCement's 0.8Mt/yr Caspi Cement plant exceeded its rated capacity by 10%. Kazakhstan's 1.0Mt/yr Shar cement plant and ACIG's 0.5Mt/yr Khantau cement plant both produced no cement in 2020. Gezhouba-Shiyeli Cement's Shiyeli cement plant stood idle for several months in early 2020 when management and engineering staff became stranded in China due to the coronavirus outbreak.



## China: Anti-monopoly fine

The Anti-Monopoly Bureau of the State Administration for Market Regulation has fined eight cement companies US\$35m for price fixing. Caixin reports that seven companies in Shandong province formed Zibo United Cement Enterprise Management in 2017 to manage their arrangement through invoicing, sales, setting prices and coordinating operating regions. The extent of the anti-competitive behaviour between the companies extended to organising a price management committee to manage the arrangement by monitoring sales and even fining members in breach of its self-declared rules.

As well as Zibo United, the other companies in the reported cartel were Shandong Baoshan Technology, Shandong Donghua Cement, Shandong Shanlü Environmental New Material, Zibo Luzhong Cement, Shandong Chongzheng Special Cement, Zibo Shanshui Cement and Linqu Shanshui Cement.

## South Korea: Ssangyong rebrand

Ssangyong Cement has announced a planned name change to Ssangyong C&E. The 'C' stands for cement while the 'E' stands for environment. Besides signalling its move into new industries driven by green value-creation, the new name is intended to reflect the company's existing values.



## Fiji: Cement grinding halted

Cement grinding plants in Lami ceased operations in mid February 2021. The reason for the pause is complaints by community stakeholders about pollution, including clinker spillages on the road from the Port of Suva.

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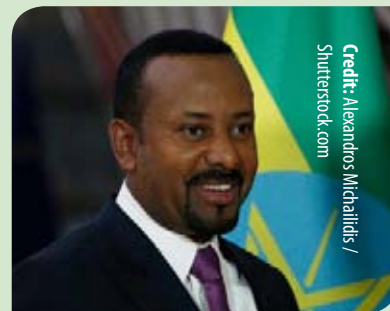


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## Ethiopia: Incredible 10,000t/day plant announced

East African Holding and China-based West China Cement have formed a joint venture with a plan to establish a multi-industrial complex in Ensaro Woreda district, Amhara regional state. To be known as the Lemmi National Cement complex, the facility will house a 10,000t/day cement plant in addition to other industrial plants. The partners say that the facility will create 5000 jobs. The first phase of the project will establish the cement plant and reach completion in late 2022.



Credit: Alexandros Michailidis / Shutterstock.com

## South Africa: Cement & Concrete SA formed

Several of South Africa's cement and concrete producers have united to form a joint industry association called Cement & Concrete SA (CCSA). The association consolidates the former Association of Cementitious Materials Producers (ACMP), Concrete Society of Southern Africa (CSSA) and The Concrete Institute (TCI). It said that it aims to create long-term shared value and industry growth in South Africa through driving collaboration, skills development, innovation, and the highest standards in sustainable cement and concrete materials and products.

Chief executive officer Bryan Perrie said "At a time when many conflicting and ambiguous messages are shared readily on various platforms, and with the proliferation of substandard products and services, the need for authoritative engagement with all stakeholders is critical." He added, "We are excited about the future of the cement and concrete industry in South Africa. The staff of CCSA are ready to discuss membership options and benefits. We are poised to add value and unlock opportunities for all members, and the industry at large."



Image: Pouring concrete in Johannesburg.  
Credit: Rich T Photo / Shutterstock.com

## Ethiopia: 7000t/day plant nears commissioning

Prime Minister Abiy Ahmed (above) says that a new 7000t/day cement plant is almost ready for commissioning. New Business Ethiopia News has reported that the government hopes that the unnamed unit will be operational by June 2021. The 2.5Mt/yr Abay Cement plant at Dejen in Amhara region was previously scheduled for opening in early 2021. The news comes at a time of rapid cement price rises in the country. A large black market has also arisen to serve demand.

## Kenya: New acting MD for EAPCC

East African Portland Cement (EAPCC) has appointed Daniel Kiprono as its acting managing director. He succeeds Stephen Nthei, who was appointed to the temporary post in mid-2019. No reason for his departure has been disclosed. Nthei replaced Simon Peter Ole Nkeri, who was reportedly relieved of the role in mid-2019. Kiprono has worked at EAPCC for over 20 years in a variety of roles.

## Lebanon: Cimenterie Nationale halts sales

Cimenterie Nationale has announced that it dispatched its last batch of cement for the foreseeable future on 6 March 2021. The L'Orient-Le Jour newspaper has reported the cause for the stoppage as the exhaustion of stocks of raw materials. The Lebanese government suspended access by cement producers to their quarries in October 2020. The nation's three cement companies are permitted only to produce cement using clinker or limestone from existing stockpiles.

Cimenterie Nationale currently has 700 employees. It said that 3500 other jobs also depend on its activities indirectly.



Image: Cimenterie Nationale preheater tower.  
Source: Cimenterie Nationale website.



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### Saudi Arabia: Sales rise by a fifth in 2020

Several Saudi cement producers have reported increased annual sales and profits in recent weeks, including Southern Province Cement, which saw its sales revenue rise by 27% year-on-year to US\$440m in 2020 from US\$347m in 2019. The company's net profit after zakat and tax increased to US\$162m from US\$123m. Yamama Cement's sales rose by 10% year-on-year to US\$235m in 2020 from US\$214m in 2019. Its net profit after zakat and tax grew by 42% to US\$96.9m from US\$68.3m.

The reason can be seen in the country's domestic cement sales. They rose by 21% year-on-year to 51Mt in 2020 from 42Mt in 2019. After a promising start to the year, the coronavirus pandemic hit local production hard in the second quarter of 2020. However, production nearly doubled year-on-year in June 2020 and kept up the pace during the second half of the year.

NCB Capital has predicted a growth in Saudi cement sales of 4% year-on-year to 52.8Mt in 2021. The investment and analyst division of National Commercial Bank

described the sector's outlook as 'positive,' due to on-going housing programmes and the Public Investment Fund's 2021-2025 strategy, as well as a pick-up in infrastructure projects. NCB reported that demand created by the country's large-scale projects began to be felt in the fourth quarter of 2020 and associated contracts have started to be issued. Among Saudi Arabia's more adventurous projects is the 170km-long linear city of Neom (below), which will have no roads and will reportedly preserve 95% of the natural environment of the area it is built upon.



### Cameroon: New 1Mt/yr plant for Atlantic Group

Atlantic Group is planning to build a 1Mt/yr integrated cement plant in the Port of Kribi. Business in Cameroon has reported that the company has received all necessary permissions for the project. The group's only asset in Cameroon is the 48,000t/yr Atlantic Cocoa plant in the Port of Kribi, commissioned in 2020. Parent company Ivory Coast-based Atlantic Group recently inaugurated the 1.5Mt/yr Société Ciment Côte d'Ivoire (SCCI) near Abidjan in Ivory Coast. Kribi's five existing cement plants have a total production capacity of 5.8Mt/yr.

### Liberia: Newspaper accuses firm of label fraud

The FrontPageAfrica newspaper has alleged that Liberia Cement Corporation (CEMENCO) has been using imported Lion Pro cement bags from Sierra Leone that display the grade '42R' and filling them with 32.5R grade cement products. No comment from the cement producer has been forthcoming. CEMENCO, a subsidiary of Germany-based HeidelbergCement operates a grinding plant in the country.

### Saudi Arabia: Saudi White rebrands as Riyadh

Saudi White Cement has rebranded as Riyadh Cement Company. Mubasher News has reported that the company previously received regulatory approval for the change to the commercial register. It had used both names in parallel prior to the change.

### Nigeria: Dangote warns public over jobs scam

Dangote Cement has warned the public that confidence tricksters are using its name to offer 'jobs' on social media. Local press reports that applicants are then being required to pay an 'administrative fee' to the scammers.

Dangote Corporate communications director Francis Awowole-Browne said "The job advertisements are entirely false and are intended to defraud unsuspecting members of the public. We fill job positions through formal procedures. Furthermore, we never request candidates to pay a fee before they are considered for any position."



These pages give *Global Cement Magazine'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 64. In this issue subscribers receive information from: Chad, China, Ethiopia, Lebanon, Oman, Pakistan, Saudi Arabia, the UAE and the US. Prices are for metric tonnes unless otherwise stated. US\$ conversions from local currencies are correct at the time of original publication.

**India:** A dealer check conducted by Motilal Oswal Financial Services shows that cement prices rose by around US\$0.21-0.42/bag (50kg) in India in February 2021. This has taken the All-India average to US\$4.96/bag.

In the south of India, prices increased steeply, by 8% month-on-month. Motilal's survey also showed that prices in the east had climbed by US\$0.31/bag, despite an increase in available capacity. Northern prices were up by 4-5% month-on-month compared to January 2021, while those in the centre of the country rose by 5-10%.

**Philippines:** Cemex Holdings Philippines reported that its cement sales prices fell by 6% year-on-year in 2020 due to higher capacity in the domestic market and lower than expected construction rates due to the Covid-19 pandemic.

**Egypt:** Ordinary Portland Cement prices as at 16 March 2021: Arabian Cement Co (Al Mosalah) = US\$53.46/t; Minya Portland Cement (Minya) = US\$49.65/t; El Nahda Cement (Al Sakhras) = US\$47.74/t; Wadi El Nile Cement = US\$49.52/t; Lafarge (Al Makhous) = US\$50.92/t; Arish Cement (Alaskary) = US\$48.57/t; Sinai Cement (Sinai) = US\$48.69/t; Suez Cement (Al Suez) = US\$54.74/t; Helwan Cement (Helwan) = US\$55.06/t; Misr Beni Suef = US\$50.61/t; El Sewedy Cement = US\$54.43/t; Titan Beni Suef = US\$49.65/t; Misr Cement Qena (Al Masalah) = US\$47.62/t; Al

Watania Company for Cement in Beni Suef = US\$48.89/t.

White cement prices as at 16 March 2021: Sinai White Cement (Alabid Elnada) = US\$159.15/t; Sinai White Cement (Super Sinai) = US\$156.61/t; El Menya Cement (Super Royal) = US\$152.15/t; El Menya Cement (Royal Elada) = US\$154.70/t; Menya Helwan Cement (Alwaha Alabiad) = US\$154.38/t.

Blended cement prices as at 16 March 2021: Cemex (A.one) = US\$42.66/t; Helwan Cement (Al Waha) = US\$47.76/t; El Sewedy Cement (Sewedy Tashtibat) = US\$47.12/t.

Sulphate-resistant cement prices as at 16 March 2021: Minya Portland Cement (Asec Sea Water) = US\$50.83/t; Lafarge (Kaher Al Behar) = US\$54.78/t; Suez Cement (Al Suez Sea Water) = US\$55.60/t; El Sewedy Cement (El Sewedy Al Mukawem) = US\$55.29/t; Al Watania Company for Cement in Beni Suef = US\$650.51/t.

**EU ETS:** The cost of CO<sub>2</sub> emissions permits continued to break new ground in February and March 2021, breaking the Euro40/t barrier for the first time on 9 March 2021 (Euro40.58/t). It has subsequently stayed above Euro40/t, hitting a record Euro42.77/t on 12 March 2021. As of 15 March 2021, the price was Euro42.29/t, a week-on-week increase of 8.2% from Euro39.07/t on 8 March 2021. The month-on-month rise was 7.1% compared to Euro39.47/t on 15 February 2021 and the year-on-year increase was 118% compared to Euro19.41/t on 16 March 2020. Note that the 16 March 2020 price was subdued due to the onset of the Covid-19 pandemic in Europe, with prices of Euro24-25/t in the preceding weeks. The price has not dipped below Euro30/t since 9 December 2020 and has remained above Euro35/t since 2 February 2021.



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Reducing emissions with human laziness...

**Peter Edwards** Editor, *Global Cement Magazine* ([peter.edwards@propubs.com](mailto:peter.edwards@propubs.com))



The transition to net-zero CO<sub>2</sub> living, apparently set to take place by 2050, will require a lot of changes to our way of life. We provide coverage to the many ingenious technical solutions to CO<sub>2</sub> in these pages, but researchers in Switzerland may have identified another useful method: Human laziness.<sup>1</sup>

In 2016, two Swiss energy providers changed their default electricity tariff to 100% renewable energy. This represented a 3–8% cost increase for residential consumers and up to 14% for businesses. All were made aware that they were completely free to switch back to a cheaper tariff that included fossil fuel-derived power. A phone call or email would have been enough, but after four years, 80% of households have stuck with the renewable tariff. For small businesses the retention rate was 70%. Only 3% of consumers had actively sought out a renewable tariff before the change of the default option.


So what's going on? The research team, from ETH Zurich, led by Professor Andreas Diekmann, think that they have found a useful example of the default effect, taking advantage of people's reluctance to actively change from the expected or normal option set out before them. Change the default and you can change the behaviour, with relatively little resistance.

The default effect can be used for 'good' and 'evil'. In many fast food restaurants it is now impossible to opt for a 'small' portion. 'Medium' has long been the default option, making 'large' seem less large and thus encouraging people to over-eat. In the opposite direction, switching free sweets on the front desk of a hotel for fruit or nuts will inevitably result in people eating more fruit or nuts rather than sweets, hopefully with health benefits. Another example is donor cards. Ask people to opt in to an organ donor scheme in the event of their untimely demise and only the most enthusiastic will fill out the paperwork. Switch to an opt-out system and relatively few will bother to leave, ensuring a far greater supply of life-saving organs.

As with the above cases, the Swiss home and business owners didn't think that the extra cost of the new tariff warranted the effort to go back to the cheaper tariff. It is also possible that opting to 'inflict damage' on the planet is actually something humans like doing even less than acting to 'save it.'

This is reassuring because, while Switzerland's high proportion of hydroelectric power makes it a somewhat unusual case, the researchers see no reason that the approach wouldn't work worldwide as renewable energy becomes more prevalent. Speaking to BBC News, co-author Dr Jennifer Gewinner said "People are a bit overwhelmed because (tariffs) are a hard topic to actually feel competent with. So if you help them and tell them we are all moving to renewable energy, they feel okay. It was kind of what they wanted to do anyway."

The lessons of the Swiss study could dramatically reduce CO<sub>2</sub> emissions from other countries, particularly those with high winds or lots of sunshine. Even taking relatively cloudy Germany as an example, they calculated that the default renewable approach for private households alone would cut CO<sub>2</sub> emissions by 45Mt/yr, around 5% of the country's total emissions. The research team argues that the study could be used to estimate the demand for renewable power during the transition to net-zero CO<sub>2</sub> emissions. Multiplied across the world, it appears that there could be a lot to be gained from relying on humans to be lazy.

"Changing people's attitudes and beliefs takes a lot of time," Dr Gewinner told BBC News. "But we can do this without changing people's belief structures, just by being human." 

1. Liebe, U., Gewinner, J. & Diekmann, A. *Large and persistent effects of green energy defaults in the household and business sectors*. *Nat. Hum. Behav.* (2021). <https://doi.org/10.1038/s41562-021-01070-3>



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