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FEBRUARY 2016

global cement MAGAZINE

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This issue's front cover...

Cemengal now offers a new service to the cement industry: Full support for the preparation and use of alternative fuels.

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global cement MAGAZINE

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Exclusive Official Magazine for

Global Cement Conferences: Global CemFuels, Global Slag, Global CemCoal, Global CemPower, Global EnviroCem, Global Boards, Global Well Cem, Global CemProcess.

Dear readers,

Welcome to the February 2016 issue of *Global Cement Magazine* - the world's most widely read cement magazine. This issue will be distributed to all delegates at the forthcoming 10th *Global CemFuels Conference & Exhibition* in Prague, Czech Republic on 22 - 23 February 2016. The event is expected to attract up to 200 delegates from more than 35 countries and the *Global CemFuels Exhibition* will once again be a who's who of the world's best suppliers to the alternative fuels sector. We look forward to seeing you in Prague.

To tie in with the themes and location of the event, this issue has a comprehensive look at the challenging situation in the Czech cement market (Page 30), two articles on alternative fuel and all of our regular features and industry news. There is also an update on the cement industry of neighbouring Austria (Page 36). As well as a packed presentation and networking schedule, the *Global CemFuels Conference* features two optional plant tours, to the LafargeHolcim Čížkovice plant and the Cemex Prachovice facility, both of which are voracious consumers of alternative fuels. We have visited both plants and review them in this issue: Turn to Page 40 to read about Prachovice and to Page 46 for Čížkovice.

Looking at the global cement news in this issue, we see a great deal of news confirming the economic slowdown in China, the world's largest cement producer. As well as warnings of major losses from some big names comes the understated admission from the China Cement Association (CCA) that the country's cement capacity utilisation was just 65% in the first nine months of 2015. The CCA reports that a total of *1339* cement companies made a loss, collectively losing an incredible US$2.6bn, in the same nine month period. This is a truly unsustainable situation that surely demands even more drastic capacity reduction than we have already seen. How China manages this situation now that it has admitted to just how bad the situation is will be a very interesting story to watch through the rest of the year - We wait and see!

We hope you enjoy this issue of *Global Cement Magazine* - the world's most widely-read cement magazine!

Dr Peter Edwards
Editor

Cement Industry Suppliers' Forum

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Editorial Director
Dr Robert McCaffrey
rob@propubs.com
(+44) (0) 1372 840951

Editor
Dr Peter Edwards
peter.edwards@propubs.com
(+44) (0) 1372 840967

Deputy Editor
Dr Amy Saunders
amy.saunders@propubs.com
(+44) (0) 1372 840955

Web Editor
David Perilli
david.perilli@propubs.com
(+44) (0) 1372 840952

Commercial Director
Paul Brown
paul.brown@propubs.com
Mobile: (+44) (0) 7767 475998

Business Development Executive
Sören Rothfahl
soeren.rothfahl@propubs.com
Mobile: (+44) (0) 7850 669169

Company manager
Sally Hope
sally.hope@propubs.com

Subscriptions
Amanda Crow
amanda.crow@propubs.com

For full details on article submission, please see:
www.GlobalCement.com

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European cement

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Sussan Pasuki, Senior Alternative Fuels Manager, Leimen, Germany

The United Nations Climate Change Conference and its influence on HeidelbergCement's alternative fuel strategy

...or, 'What does the Pope have to do with alternative fuels?'

Fuel consumption is a key topic in the cement industry given the numerous issues involved, including costs, availability and environmental concerns. Every cement plant must have a well-planned fuel programme to ensure reliable cement production or else risk revenue loss. Here, Sussan Pasuki, Senior Alternative Fuels Manager for HeidelbergCement, outlines HeidelbergCement's alternative fuels strategy in view of the results of the 2015 United Nations Climate Change Conference in Paris and its upcoming acquisition of Italcementi.

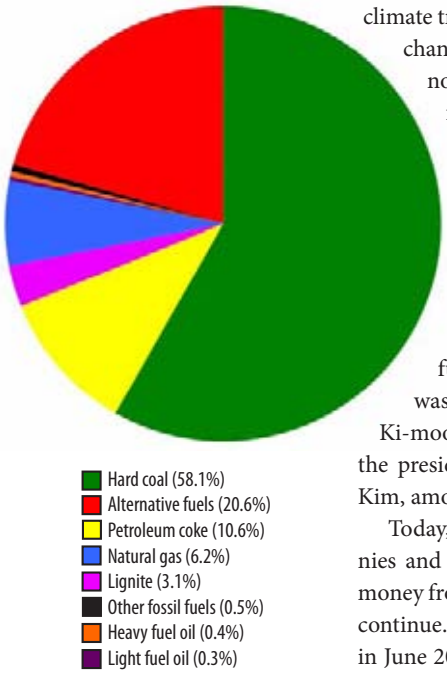
Overview

Commuters driving to work by car each day have to admit that they are quite relaxed, since petroleum prices have been very low for months now. None of them will probably think about buying a new e-car, a hybrid or even switching their car for a bicycle. Keeping this in mind and looking at cement production, one of the most energy consuming industries in the world, voices are heard saying that we should reduce the 'hard to handle and trouble-causing' alternative fuels due to low coal, pet coke, gas and oil prices.

However, looking at the results of the 2015 United Nations Climate Change Conference (or COP21) in Paris, which has concluded new goals in connection with stopping global warming, cement producers and other industrial production sites will not be able to go the easy way. The reason for the outcome and the broad approval of the tough and ambitious global climate treaty during the conference is clear: Climate change is getting more and more visible and does not only impact on a minority of people living far away from Europe. Non-government organisations (NGOs) and other relevant opinion leaders are taking action. At this point we come to Pope Francis, who recently published the encyclical "Laudato si," which deals with climate change and other environmental topics. His paper, demanding an about-turn away from fossil fuels to the direction of renewable energies, was very much appreciated by people like Ban Ki-moon, the Dalai Lama, Kofi Annan and even the president of the World Bank Group, Jim Yong Kim, among others.

Today, the first pension funds, insurance companies and banks have started to draw back invested money from fossil fuel projects and this tendency will continue. Already during the G7 summit in Germany in June 2015, a declaration was signed that included the goal to stop using coal, oil and gas by the middle of this century. All these actions and goals will put pressure on fossil fuel users, while the voices raised to push CO_2 prices higher again are louder than ever. As a consequence, even if fossil fuel prices remain low in the short term, which could still be subject to change at any moment, CO_2 costs will put pressure on overall clinker and cement production costs. It's just a question of time.

Below - Figure 1: HeidelbergCement's fuel use in 2014 (%).



Options for CO_2 emissions reductions

What options do cement producers have to reduce their CO_2 footprint? Developing low energy clinker and/or cement could be a solution, as could new production methods without using fossil fuels at all. Or even Carbon Capture and Storage/Utilisation projects. HeidelbergCement Group is working on all of these developments in parallel. Nevertheless, while these innovative solutions will take time to make a significant impact, there are already four proven ways of dealing with the challenge right now:

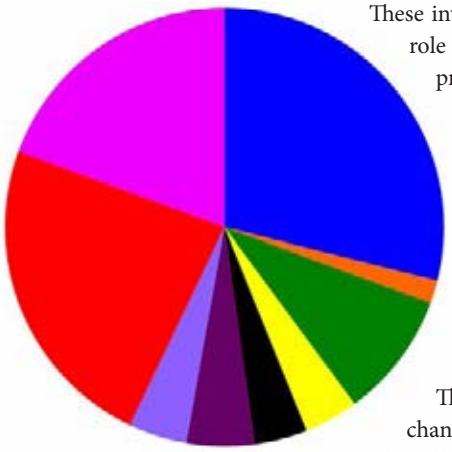
1. Process optimisation, including energy reduction in clinker and cement production;
2. Reuse of waste heat;
3. Increased use of cementitious materials to substitute clinker in cement;
4. Increased alternative fuels and raw materials use.

HC operations supported by experts of HeidelbergCement's Technology Centers are working on all four topics. During intense plant audits, weak points leading to losses of electrical or thermal energy are detected and analysed and the outcome is turned into action plans. Follow-up surveys ensure the implementation of optimisation measures. Meanwhile, HeidelbergCement has implemented its second European waste heat generator at its cement plant in Fieni, Romania. The company has also committed to

decrease the clinker content in its cement to 70% and increase the use of alternative fuels to 30% by 2020.

Questions have been raised recently on whether the merger with Italcementi will affect this ambitious target, since the alternative fuel ratio of the Italian cement producer was 10.8% in 2014. Of course, new targets have to be set under the influence of the massive growth of HeidelbergCement. However, a lot of experience in starting-up, running, optimising and increasing alternative fuel consumption has been gathered over the past 30 years in both companies. These invaluable experiences will play a noticeable role in the success of future alternative fuels projects in the expanding HeidelbergCement family. Also, since alternative fuel usage is a complex topic, training, education and proper know-how transfer has a high priority in the group.

Below - Figure 2: HeidelbergCement's alternative fuel use in 2014 (%).



Waste markets

One key question for new projects is the availability and market of alternative fuels; waste markets are a matter of change. The energy mix portfolio of the plants is changing with the rise and fall of environmental challenges, regulations, transport and shipping costs, competition and many other factors, as waste streams might end or change direction. For example, oil sludge from the cleaning of old oil lagoons is no longer available in the middle of Europe and has been replaced mainly by refuse-derived fuel (RDF), but today the same efforts to remediate the environment are taken in Eastern Europe and Asia. Working together with international and local NGOs, universities and European funding organisations ensure a tailored regional approach in these cases.

Looking at alternative fuels and their properties, one has to admit that co-processing is a science in itself. The biggest portion of waste fuels in the group's portfolio is taken by RDF and the overall quality of these alternative fuels has been decreasing for years. Heat value, water content, chlorine and other factors are challenging, even more so when the thermal substitution rate exceeds 50%. Trying to find a balance between handling costs and savings by fossil fuel substitution is key. Several projects are ongoing to either increase the quality of the wastes or to implement the technology to be able to use them as they are:

- Drying RDF;
- Improving the burnability by cutting/milling RDF;
- Special installations to increase the residence time of coarser RDF;
- Oxygen injection;
- Online monitoring of moisture and heat value.

These projects are settled for both cement plants in embryonic waste markets which are just starting up the use of alternative fuels and for well-equipped cement plants in mature waste markets, pushing their kilns from 75% to more than 80% fossil fuel replacement. Summarising the results of HeidelbergCement's efforts, the group successfully replaced over 2Mt of high quality coal in 2014.

Outlook

Reaching HeidelbergCement's ambitious environmental targets is a matter of long term strategy and development, since some projects need years to show the first fruitful outcome. This is especially true for projects in developing countries. Being ahead with knowledge on technical, commercial and political developments ensures and strengthens the position of HeidelbergCement in alternative fuels today and ensures the company will be prepared for a future without fossil fuels, in line with the COP21 outcome.

Right: HeidelbergCement's Lengfurt cement plant in Bavaria, Germany was the company's top alternative fuels user in 2015.

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Dr Dominik Aufderheide, Dr-Ing Luigi Di Matteo, DI MATTEO Group

Increased availability of high-precision dosing systems by remote maintenance

This article provides an overview of the concepts and methods for the use of remote maintenance procedures at cement plants in order to drive efficiency and cost reduction. The technical aspects for the realisation of remote access solutions are described against the background of the heterogeneous IT infrastructures and security found in modern cement plants. Corresponding possibilities for a proactive service and maintenance concept are also introduced. It can be shown that the implementation of such services leads to large cost-reductions and a parallel increase in plant availability.

This article looks to achieve the reasonable goal of increasing the availability of technical systems, such as the systems that cater for alternative fuel handling in cement plants. The availability of a technical system is often measured by using the definitions of the VDI 3423 as released by the Association of German Engineers (VDI), in which:

$$Availability = \frac{(Total\ time\ of\ evaluation\ period - Down\ time\ in\ evaluation\ period)}{Total\ time\ of\ evaluation\ period}$$

However, for a practical evaluation of the availability of alternative fuel feeding installations, the down time needs to be separated into scheduled and unscheduled periods. Scheduled downtimes should not affect the availability measured. For this reason the definition of the inherent availability (A_i), which can be considered as the steady-state availability after the initial commissioning process and the typical adaption period are successfully completed. If the availability is defined as a time-dependent function A(t) (often referred to as the instantaneous availability), the steady-state availability (See Figure 1) can be defined as:

$$A(\infty) = \lim_{t \to \infty} A(t)$$

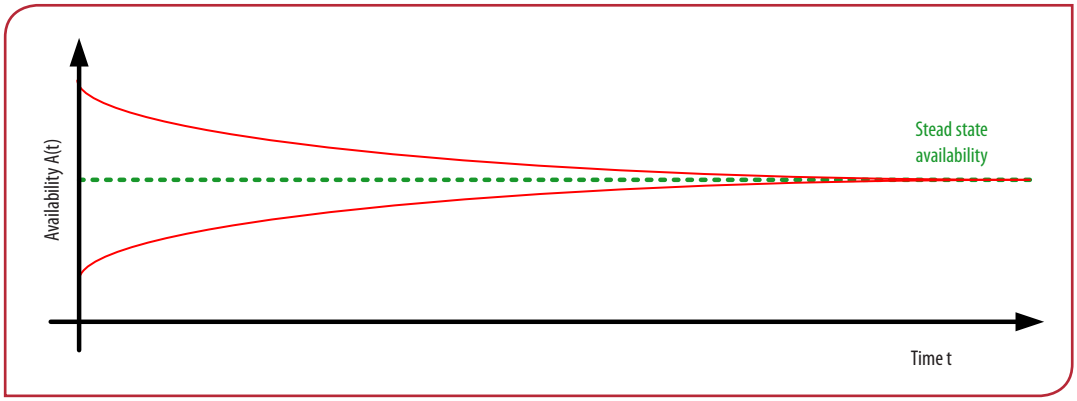
The exponential curve of A(t) after the initial commissioning process can have a negative or positive slope, as the negative effects of an initial instability during the adaption process and the benefits from a complete new installation can be combined in either direction.

Due to the fact that it is rather difficult to define the exact transient behaviour of A(t) for real installations, a more practical approach towards a definition of the availability is shown in the following equation:

$$A_i = \frac{MTBF}{MTBF + MTTR}$$

Here, the mean time between failures (MTBF) and the mean time to repair (MTTR) are used to define the inherent availability (Ai). A_i is used for complex technical systems where availability is not determined by any single component but as a consequence of the interactions between numerous complex technical entities. It can be increased by either increasing the MTBF, decreasing the MTTR, or both.

While the MTBF depends mainly on adequate engineering decisions and reasonable proactive service actions, the MTTR value is influenced by more complex factors. These include training of service personnel, accessibility of different system components and the usability of the software. Even if the



Right - Figure 1: Steady state availability.

definition above appears simple, we must remember that the MTTR and MTBF are only constant once a steady-state is reached.

Remote access and maintenance

The appropriate use of remote access and maintenance solutions can help to increase the MTBF. Solutions that draw on DI MATTEO's extensive knowledge in the design, manufacture and installation of alternative fuel feeding equipment are given here as examples of how remote systems can be included in the make-up of alternative fuel dosing systems.

DI MATTEO designs, produces and installs a variety of conventional feeding systems like the ODM-GraviSCALE and its innovative ODM-WeighTUBE, which, due to the fact that the load cells are completely separated from the bulk-material, allows for very accurate dosing and an increase in MTBF - See Figure 2. The group has also conducted intensive research into the handling and classification of alternative fuels, developing its Seven Stage Concept (SSC) for alternative fuel handling: Reception; Preparation; Storage; Transport; Metering; Feeding to the kiln and; Combustion.

The SSC shows that the metering device is one of the most critical parts of the whole alternative fuel conveying line. Therefore, the availability of the dosing unit is often critical to the overall reliability of the installation. For a dosing system, it is important to avoid not only downtime but also periods where the dosing accuracy is not within the required range.

A malfunction

Unfortunately, for many service and maintenance personnel on the ground, alternative fuel dosing systems can be 'black-boxes.' It can be difficult to fully understand the inner reasons for malfunctions. This can make it difficult to resolve problems without the help of a service technician, leading to increased MTTR times.

For this reason DI MATTEO has developed a full modular hardware and software concept for the control of gravimetric dosing controllers, the ODM-GravitAS control system. This concept implements a modular hardware approach, which is based on off-the-shelf products from widely accepted vendors of automation products. Furthermore the software implementation is based on common open standards for PLC languages, such as IEC 61131-3, or quasi-industrial PLC standard language sets (e.g.: STEP7 from Siemens).

Due to the fact that service personnel can identify and resolve problems by using the tools and systems that they are already used to, the MTTR may be drastically decreased in-house. Furthermore it is possible to include a remote access option to immediately connect to the control system from anywhere in the world.

Above - Figure 2: ODM-WeighTUBE® – High precision tubular weigh feeder.

Remote access and maintenance as a tool for increasing availability

For years DI MATTEO has also offered modular concepts for the integration of remote access (RA) solutions within its control and automation systems of complete installations. One prominent example is the GravitAS-RA remote access module, for gravimetric high precision dosing platforms, such as the ODM-WeighTUBE®.

The ODM-GravitAS RA remote access and maintenance solution is based on the integration of a GravitAS-RA industrial router within the control cabinet of the dosing device. The router is responsible for the management of the connection to the local PLC, which can be done using a variety of standard languages depending on hardware to be used. An example set up is shown in Figure 3.

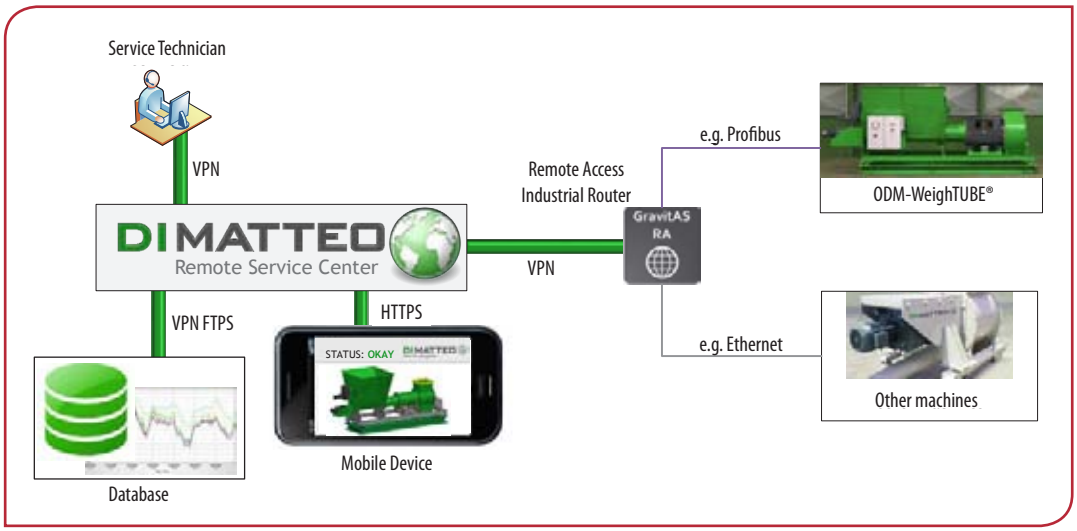
The same variety of interfaces is also available for the connection of the module to the internet. In all cases the connection between the internet and the module is not continuously available, but will be only established by special control instructions (e.g. by text message) by DI MATTEO automation technicians or by request from the plant. Doing this reduces the cost of the connection and enhances security.

Let us assume that the technical system is not operating due to a malfunction. For this reason a maintenance action needs to be executed, the duration of which will be affected by different factors. The overall downtime (t_d) is affected by the physical characteristics of the system, spare part availability, repair crew availability, human factors and environmental factors to name a few. We can divide t_d into two categories:

Waiting downtime (t_{dw}): The time during which the equipment is neither in operation nor undergoing any kind of repair or service. This could be due to the time it takes for replacement parts to be shipped and administrative processing time.

Active downtime (t_{da}): This is the time during which where service personnel are actively working on the machine.

Of course... $t_d = t_{dw} + t_{da}$



Right - Figure 3: Remote service and maintenance architecture with dedicated DI MATTEO remote service centre.

If these times are measured for a number of interventions, the typical MTTR of an installation can be estimated by means of statistical modelling. The MTTR can then be interpreted as a measurement on how well an organisation can respond to a problem with a given machine, providing insight into avenues for possible future improvement.

Both t_{dw} and t_{da} can be reduced if a remote access system is being used. The most obvious time savings are associated with the fact that specialised personnel from the supplier do not need to travel to the plant to assess the problem. This means that all problems related to software glitches can be solved from a distance. If a mechanical problem is the root cause of the downtime, the waiting time can still be reduced. This is because the system allows the technician to do an in-depth analysis of the problem using archived process values.

In DI MATTEO's experience, this has led on numerous occasions in which service technicians in the plant were able to resolve the problem on their own based on detailed 'how-to' descriptions delivered from DI MATTEO remotely. If a spare part is needed, the detailed information about prior operating conditions will pin down the cause of faults and enable the service technician to take the correct parts as soon as it is decided that a visit is necessary.

Conclusion

The implementation of a remote access module within actual installations for alternative fuel dosing and feeding provides numerous possibilities for increasing the overall availability of the installation. If the availability is defined as a function of MTBF and MTTR, it can be shown that both indicators can be positively influenced by the use of the services included within a remote access module. Due to modern connection architectures based on virtual private networks (VPNs) and the inclusion of the DI MATTEO remote service centre as a natural firewall between the end-user and the machine itself, security concerns are no longer justified.

The smart integration of a remote access strategy can help to dramatically increase the availability of an installation and should be common sense for all planners of such machines. The relatively low integration costs are compensated in most cases during the first use of the remote access due to the enormous savings in travel and personnel costs. In this context it should be mentioned that small scale solutions can also be easily integrated within existing installations.

Right - Figure 4: Plant staff and Di Matteo operatives can access the alternative fuel feeding line using the Di Matteo App.

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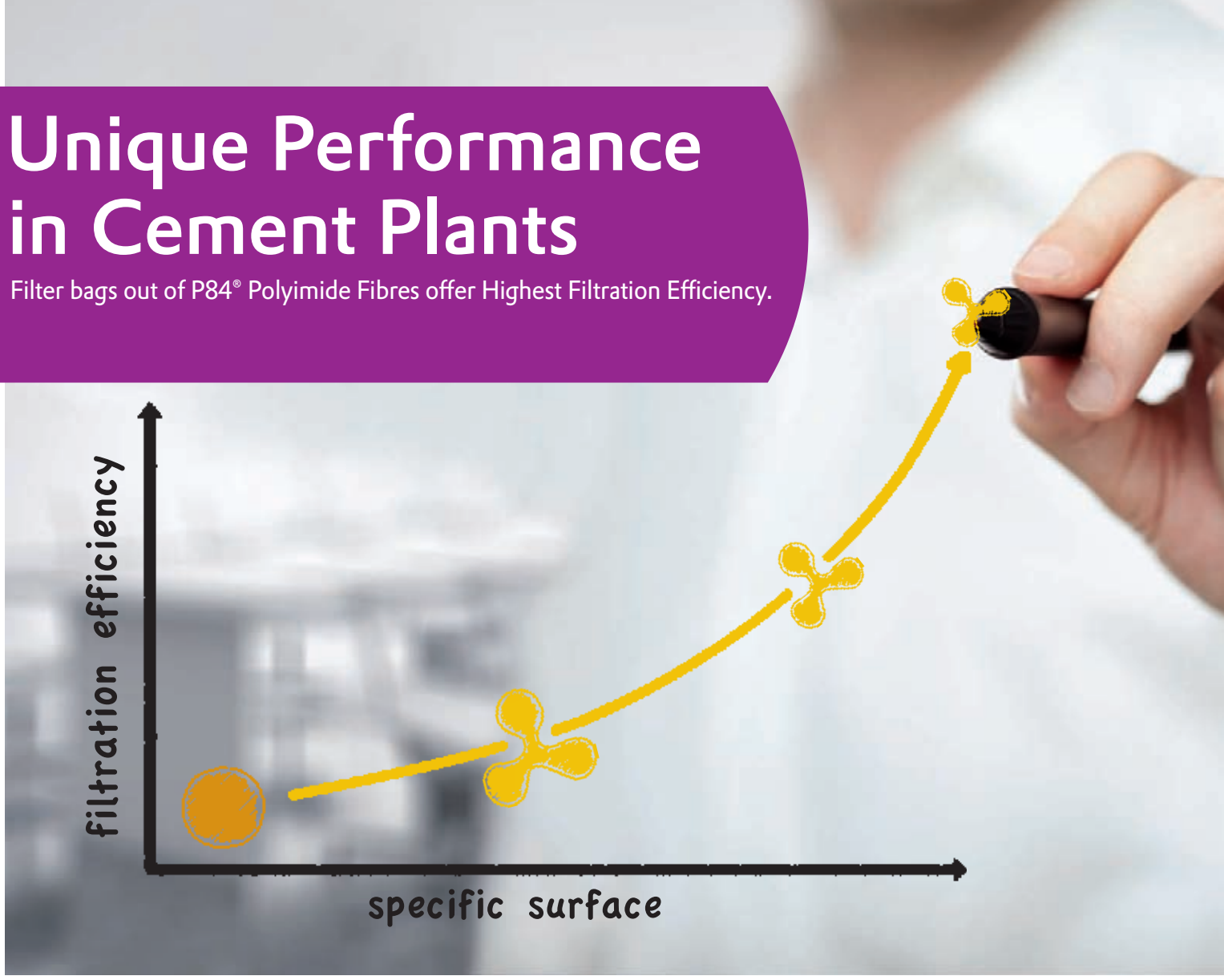

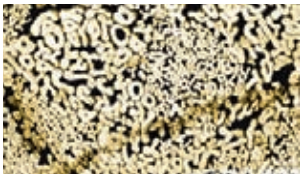

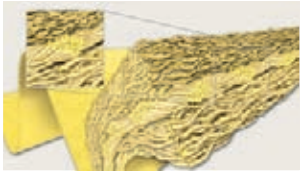

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BEUMER Group

Calucem installs a bespoke packing line for a special compound

Calucem d.o.o., a member of Calucem Group and based in Pula, Croatia, is a manufacturer of calcium aluminate cements that are predominantly used in the refractory industry. The company recently replaced its previous packaging line with BEUMER filling, palletising and packaging systems. The new pneumatic filling system will simplify the process of moving material into the packaged units and is a more energy-efficient option.

Calucem d.o.o. is one of the leading suppliers of calcium aluminate cement, which is sometimes also referred to as high-alumina cement. The company exports to more than 60 countries.

Calcium aluminates are produced when limestone or bauxite is burned in furnaces at temperatures above 1500°C. "Calcium aluminate cement is resistant to high temperatures, chemical substances and corrosion," explains Alfred Blažina, managing director at Calucem. "Due to these properties, it is used in the refractory industry, foundries, kilns and combustion chambers as well as in the building industry." Calcium aluminate cements can be found in rapid repair mortars, ceramic adhesives and sealing material.

Calcium aluminate cement is also particularly important for refractory concrete. It influences the rheology, the setting characteristics, the sifting properties and the chemical resistance. There is a growing demand for more resistant high-performance products, including HiPerCem, a recent addition to Calucem's portfolio. It is used for the formulation of highly sophisticated refractory concrete. "The very innovative concept is based on a high calcium content, combined with an optimised grain size distribution," explains Blažina.

As with Calucem's other products, HiPerCem is ground, filled into bags, then palletised, packaged in film and transported to customers and retailers. "Up until now, we had used systems that were highly energy intensive and high in maintenance," says Blažina. Calucem's employees were responsible for changing the filling system from one cement mixture to another, which was never a trouble-free process. Depending on its composition, the material can be more fine or coarse. After a mixture change, large amounts of dust were generated, meaning that material was lost. In search of a new solution and a suitable business partner, Calucem quickly found BEUMER Group. "Our product has very specific properties," explains Alfred Blažina. "We needed a supplier that could develop a tailored solution."

"We installed the entire line," says David Žargi, BEUMER representative for the Western Balkans and supervisor for the Pula cement plant. "Calucem needed compact systems that work efficiently, require little maintenance and can be operated intuitively by the employees," says David Žargi.

"The cement industry normally uses turbine filling machines," explains Stefan Bonenkamp, commissioning engineer at BEUMER. "They are particularly suited for free flowing products, such as cement." However, HiPerCem can be finer than regular Portland cement, but it can also be pulverised or gritty. In the case of Calucem, BEUMER installed a BEUMER fillpac filling machine with two spouts that operates according to the air filling principle. This guarantees loss-free filling of varying compositions.

Air filling machines are often used in the food industry. They use a blower to fluidise the material

Right: The Calucem cement plant in Pula is located directly next to the sea.

that is to be filled, e.g. flour or cacao powder. These products can then be filled into bags, gently and precisely, without mechanical stress and at minimal air consumption.

The product is filled according to the gross weight principle, i.e. the bags are weighed during the filling process. The BEUMER fillpac is therefore equipped with calibration-capable weighing equipment. This electronic weighing ensures exact filling. Software supports permanent communication between the balance and the filling spout. The product is then

transferred through a rotary flap into the filling boiler. The ventilation of the boiler floor and of the upper part of the boiler can be regulated separately, which guarantees a continual product discharge. It creates a steady product flow with minimal compressed-air consumption. A special filling nozzle is equipped with a vent duct and an ejector that operates in cycles, extracting air from the bag during filling.

After each filling process, the filling nozzle is cleaned using pressurised air. This prevents the filled bag from being soiled. "The quantity of the conveying air can be adjusted separately, depending on the product", says Bonenkamp.

Calucem also needed a compact and energy-saving solution for fully-automatic, efficient and, above all, fast palletising of the bags. For this, BEUMER provided the fully automatic BEUMER robotpac, which is able to solve complex palletising and depalletising challenges reliably and efficiently. An ultrasound system ensures the precise measurement of the bags before they are palletised. This way, the position of the item can be exactly calculated and the bags can be placed precisely and gently.

The robotpac palletises up to 600bags/hr. Two gripping tools are used, a suction gripper, which places a paper sheet on the pallet, and a fork gripper, which palletises the bags in the exact position on the carrier. The robotic palletiser is very robust, which ensures a secure operation even under extreme conditions. This means high reliably, high efficiency and low noise.

The line is completed with an adapted BEUMER stretch hood. A new film transport system, which is particularly gentle on the material, introduces the previously formed film hood into the system. On its way to the crimping and stretching unit, the sealing seam on the film hood cools down so that it can be crimped without losing time.

Left: The cement industry normally uses turbine filling machines. However, Calucem opted for a BEUMER fillpac air filling machine, because its cement compositions can vary greatly and are often finer than that of traditional cement.

The pallets are packed in a shorter cycle time, which increases the packaging capacity at a lower air consumption rate. Economical motors and a lower demand in compressed air lower the overall energy requirement.

Left: Minimal dust is generated when using the BEUMER fillpac for filling.

Left: The new BEUMER stretch hood A packaging system has a high packaging capacity at a low energy consumption rate.

Easier maintenance

In order to facilitate the work for the maintenance personnel and to ensure high system availability, the new packaging system no longer needs a platform. Maintenance work, such as changing the blades or the sealing bars, is now handled at floor level. The operator opens a drawer, providing free access to blades and sealing bars. Other benefits include the compact design, low height and small footprint.

Oversight

The entire line is controlled by a BEUMER Group Human Machine Interface (HMI). This newly-developed operator panel has an optimised user interface and graphical navigation for operating the system. This easily understood and intuitive interaction concept helps to define efficient working sequences. The soft-touch panel uses pictograms to guide the user through the machine control menus. The panel also gives the operator access to all required training programmes and content.

Sabrina Santarossa, Turboden

The Organic Rankine Cycle in practice at Rohožník, Slovakia

After the successful start-up of the Turboden organic Rankine cycle (ORC) waste heat recovery (WHR) unit in 2012 for Holcim Romania, Holcim Slovakia (now part of the CRH Group) decided to increase the efficiency of its 3600t/day cement plant located in Rohožník, through a further ORC installation. The ease of operation, along with minimum maintenance requirements and wide range of operations, are some of the characteristics that drove the company to install an ORC-based WHR plant, rather than a traditional steam-based system.

Turboden's credentials in the field of ORC WHR includes 25 plants in locations such as Italy, Germany, Finland, Singapore and Morocco. The first of these was installed in Italy to recover waste heat from an internal combustion engine and later on from industrial process such as glass, steel and cement production. Most of the ORC WHR plants are based on the traditional scheme with an intermediate loop (e.g. thermal oil, pressurised water, saturated steam) between the hot gas and the thermal oil, and then exchanging the heat with the organic fluid. With the direct exchange scheme, the ORC working fluid exchanges heat directly with the heat source. The ORC-based direct heat exchange WHR scheme was already employed for the heat recovery from internal combustion engines and in a steel production plant demonstrating flexible and reliable operation. In addition, a further three ORC units are under construction to exploit waste heat from gas turbines and burning biomass. All of Turboden's previous tailored WHR applications prove the viability and efficiency of individual solutions based on each facility's unique properties.

Briefly, the upsides of using a direct heat exchange solution are as follows: A more compact layout; Lower operational and maintenance costs; Higher electrical output and; Lower investment costs. A direct heat recovery exchange solution, if compared to a traditional thermal oil based solution, will lead to a 5-15% greater net output and the expected saving from costs are in the same range. This leads to an overall expected improvement (in terms of Euro/kW) between 10 to 30% compared to traditional solutions. On the downside, the main barrier to implementing a direct exchange solution is the correct positioning of the heat exchanger, which must be relatively close to the ORC skid.

Rohožník case-study

The Rohožník cement plant burns petcoke and alternative fuels. After the rotary kiln, the exhaust gases leave the pre-heater cyclones at 360°C, while hot air from the clinker cooler is also available for heat recovery at a temperature around 310°C.

Two separate heat exchangers are installed, coupled to each heat source, with different technical features due to the different characteristics of the exhaust gases. The gas from the preheater is sticky and the dust from the clinker cooler is abrasive.

The heat contained in the exhaust gases is transferred indirectly, via a thermal oil loop, to the ORC plant. The two thermal oil streams are put together to feed a single ORC unit and an open cooling water circuit is then used to condense the organic fluid.

Optimisation of performance and cost were done together with the supplier of the heat recovery exchangers and the Holcim team. During the bidding phase, several solutions were considered in order to optimise the plant. As a result, the WHR plant was

Below: Overview of the cement plant at Rohožník, Slovakia. At the time of the installation of the ORC WHR unit from Turboden the plant was part of Holcim Slovakia. In 2015 ownership of the plant passed to CRH Group as part of the divestment programme implemented by the former Lafarge and Holcim to secure approval for the formation of LafargeHolcim.

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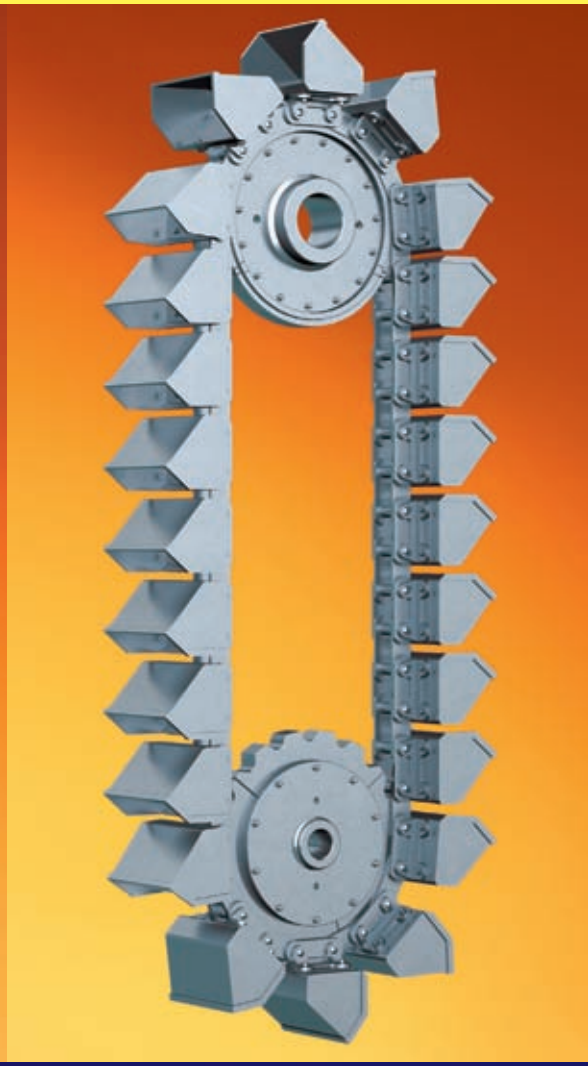

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Left: Outside the ORC building at Rohožník.

integrated with an innovative process for dust treatment that needs a small amount of hot thermal oil. Since dust treatment has a variable need for thermal power, it benefits from the flexibility of the ORC, which can work at different loads with similar efficiency.

The size of the ORC installed is 5MWe and the unit has been in operation since the beginning of 2014. Furthermore, the actual power output is higher than expected, thus leading to higher savings than had been expected by the plant.

The WHR plant was completed in less than 24 months, in contrast to the general need of 47 months for such project. Generally, a period of 12 months is needed for the delivery of the ORC to the site, plus 34 months for erection and one month for commissioning. The on-site erection of recovered heat exchanger consumes more time and the connection process mainly depends on whether the cement plant is shut down.

The quality of the water in wet cooling towers is continuously monitored in order to avoid potential fouling or clogging of the ORC condenser. In addition, the positioning of the wet cooling towers shall be carefully studied as a further precaution to avoid any clogging.

By the end of 2015, the heat recovery plant had completed over 10,000 working hours with a gross electric energy production of 42.3GWh. Furthermore, about 31,500t of CO_2 emissions have been saved throughout this process. The availability of the plant since start-up has been more than 95%.

Besides the Rohožník plant, Turboden has supplied other ORC units to the cement industry. Firstly, a 2MWe unit was installed in Moroccco for Italcementi. Two 4MWe ORC units were installed and are running in Romania at the Holcim Aleşd and HeidelbergCement Fieni plants respectively. Additionally, a 7MWe ORC unit was delivered to Canada and a 2.4MWe ORC to be fed by pressurised water is under construction for a cement plant in Switzerland.

TASIO Project

New solutions for numerous applications, heat recovery from cement plants in particular, with the aim of minimising investment costs while increasing electrical efficiency, is continuously studied by Turboden.

TASIO, a European project, acknowledges Turboden as one of its industrial partners to develop an ORC for power generation through direct heat exchange with hot gas streams typically present in cement plants. ORC for direct heat exchange in the cement field will leverage the technical solutions already available on WHR systems for cement plants (through using thermal oil, pressurised water or saturated steam as the heat carrier), together with the features developed for other applications of the direct heat exchange solution. The peculiarities of cement hot gas streams such as high dust content, possible peak operation, type of dust (sticky or abrasive) are thoroughly examined and taken into consideration throughout the design process.

Left: View of the ORC set-up at the Rohožník plant.

Conclusion

ORC WHR systems are recognised as a mature and reliable technology for the application of cement heat recovery. The Turboden ORC plant installed in Rohožník, Slovakia is a good example. The direct heat recovery exchange solutions, currently being studied by Turboden and provided to the TASIO project, could bring the heat recovery systems for cement plants with ORC systems to a more competitive level in terms of investment cost and efficiency. Meanwhile, the direct heat exchange system promises to keep the typical advantages of ORC systems such as ease of operation, low maintenance and great flexibility to meet load variations from different heat sources.

Contents
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Sweden: Report into protection of paper sacks

A recent investigation conducted by the Swedish research and technology institute Innventia has found very low damage rates to paper sacks on the way from the filler to the retail store. It found that most product losses occur due to poor handling practices at retail sites and can be avoided by informing and educating the staff responsible.

Based on the research work by Innventia, which tracked sacks from the point of fill to the point of sale, the level of damage to paper sacks for cement and other powdered building materials does not exceed 1-2%. The investigation looked at the DIY and builders' merchant retail supply chains for paper and plastic form-fill-seal (FFS) cement sacks. The spoilage rates observed for FFS bags are comparable to those of paper sacks. "This finding refutes the recent claims that FFS bags are impaired less than paper sacks," said Stina Blombäck, Senior Adviser at CEPI Eurokraft and EUROSAC, the associations that commissioned the investigation. Among the major causes of damage are incorrect palletisation and forklift operations like snagging or forklift penetration. The level of spoilage varied greatly from store to store, suggesting that different procedures and handling practices have a significant impact on the sacks and can thus be prevented by education on best practices.

Germany: bauma establishes Charity Alliance

bauma has launched the new bauma Charity Alliance, which aims to highlight the fact that companies in the construction and construction machinery sector are actively engaged both in combating hunger and poverty and in promoting education and the environment in the Third World, in addition to their day-to-day business. The launch will be held at bauma 2016, to be held in Munich, Germany from 11-17 April 2016.

Germany: Vortex appoints German representative agent

Vortex Global Limited, a European solids and bulk handling components company, has appointed the team of Adams Industrievertretungen as its exclusive agent in Germany. The company has a strong presence throughout Germany, which includes locations in Gernsbach, Mönsheim, Heilbronn, Augsburg and Ludwigshafen.

"Adams Industrievertretungen has valuable knowledge in the food, chemical, plastic, cosmetic, mineral and pharmaceutical industries," said Laurence Millington, International Sales Manager of Vortex. "They are dedicated to offering our clients the best processing solutions on the market. We believe Adams Industrievertretungen will be an excellent strategic supplier for Vortex."

Germany: Beumer celebrates 80 years of business

Beumer Group celebrated its 80th anniversary on 9 December 2015. The conveying, loading, palletising, packaging, sortation and distribution manufacturer was originally founded by Bernhard Beumer on 9 December 1935 with four employees. In 2014 Beumer Group reported a turnover of Euro680m and today it has around 4100 employees.

"The success is primarily due to the familial spirit. We have consistently held to our motto 'We are looking for the long-term success, and not for the short-term profit'," said Christoph Beumer, Chairman and CEO of Beumer Group. Beumer is the third generation of his family to manage the business and has held the post since 2000. Beumer attributes the long-term success of the company to manageable growth, a large range of products and a global market presence. Beumer machines and systems are in use at a variety of locations around the world.

Conveying technology formed the foundation of Beumer Group's business when Bernhard Beumer started the company in 1935. His eldest son, also named Bernhard Beumer, took over the company in 1981 and promoted the development of bucket elevators leading to the company's belt bucket elevators. By the mid-1980s, the supplier had installed about 100 systems altogether, while in 2007 and 2008 there were about 450 installed per year. Besides product development in the field of conveying technology, Bernhard Beumer Jr. also continued the initial development of loading systems and steered Beumer's international growth with the foundation of companies in Brazil, the USA and Asia.

In the 1960s, Beumer laid the foundation for curved belt conveying systems. The first theoretical designs on the market were from the company's Department for Research and Development. Today this group is one of the technological leaders for these systems, either as troughed belt conveyors with open design or as pipe conveyors. In the field of loading technology, Bernhard Beumer Jr. developed new products, such as the three-dimensional loading machine for loading cement bags onto trucks. In the 1970s, the engineers further developed this machine until it became completely automated. The stationary palletiser is a result of this development.

Beumer took over the Danish sortation technology specialist Crisplant in 2009, followed later by companies in India, the US and Belgium. It acquired Enexco Technologies in India, a manufacturer of grinding systems and packaging machines for the cement industry, in 2011.

"I view the company as a little jewel case," said Beumer when speaking of the company history. "When my grandfather founded it, it was no more than a little wooden box. He added some velvet lining to it and then handed it over to the second generation, my father, who added some more and embellished it further."

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UK: Hope celebrates third anniversary

On the anniversary of its third year in business, Hope Construction Materials announced plans to open new depots and extend existing sites in Dagenham (London), Southampton (Hampshire), Stratford (East London), Theale (Berkshire) and Woodham (Buckinghamshire). Details of the latest developments, all of which are expected to be open for business during the first quarter of 2016, are:

- Dagenham: A new rail-linked cement distribution depot and state-of-the-art packing facility that will, for the first time, see Hope's cement supplied in its own branded bags.
- Southampton: A new ready-mix concrete plant and rail-linked aggregates depot to receive concreting aggregate for this site and Hope's other concrete plants in Hampshire.
- Stratford: A new rail-fed aggregates depot adjacent to the Olympic Park which is the result of a partnership with rail freight operator DB Schenker. Hope is bringing high quality crushed rock to the East London market as well as supplying its own depots in the area.
- Theale: Already a rail-linked cement depot, the site is now home to a rail-fed aggregates facility and a ready-mix concrete plant supplying both materials to the Reading market.
- Woodham: Part-way between Aylesbury and Bicester, Hope's Woodham depot will supply ready-mix concrete across North Buckinghamshire.

The Hope cement plant first opened more than 80 years ago. Today, it supplies >15% of the UK's cement. More than two thirds of Hope's cement is distributed by rail. Hope also transports much of its aggregate by rail.

"Hope has been growing steadily since its launch three years ago and these latest depots are the culmination of our strategy to develop our plant network and improve the service we are able to give our customers. Together these developments represent a major investment in the business and their South East locations mean that they are sure to add value in the future," said CEO of Hope Construction Materials, Chris Plant.

Germany: HeidelbergCement and Joule announce carbon-neutral fuel partnership

HeidelbergCement and Joule have announced a partnership to explore the application of Joule's technology to mitigate CO_2 emissions in cement manufacturing.

A successful partnership could result in the co-location of Joule's Helioculture technology at one or more of HeidelbergCement's global sites. The cement plant's CO_2 emissions could provide Joule with the waste CO_2 required for its Helioculture platform. The process directly and continuously converts sunlight and waste CO_2 into infrastructure-ready fuels, including ethanol and alkanes that serve as highly blendable feedstock for diesel and jet fuel products. The process only requires sunlight, brackish or sea water and waste CO_2.

News in brief

Germany: HeidelbergCement issues debt certificates

HeidelbergCement has successfully issued Euro625m of debt certificates. Due to high demand, it was possible to significantly increase the issue volume from Euro400m to Euro625m. The proceeds will be used to pre-fund the upcoming Italcementi acquisition and reduce the volume of the bridge financing from Euro3.3bn to Euro2.7bn.

Luxembourg: Cement carrier fleet joint venture

Algoma Central has entered into a 50:50 joint venture agreement with Nova Marine Holding and its subsidiaries to create a global fleet of cement carriers under the name NovaAlgoma Cement Carriers (NACC).

Netherlands: World's first LNG-fuelled cement tanker

Ferus Smit delivered its first liquefied natural gas (LNG) powered cement tanker MV Greenland to JT Cement on 23 December 2015. The vessel is the first ever dry cargo vessel with an LNG-fuelled propulsion system and LNG tanks integrated inside the hull. The unique design incorporates a pressurised LNG tank positioned in the foreship. While sailing on LNG, the vessel will meet high emissions criteria.

Poland: Higher cement sales forecast for 2016

Poland's Association of Cement Producers (SPC) has estimated that Polish cement producers will sell 15.8-16Mt of cement in 2016, up from the 15.4Mt expected to be sold in 2015. The SPC has also predicted that, in 2017-2018, domestic cement sales growth in the country will increase. Cement sales were earlier expected to exceed 15.4Mt in 2015, but sales in September 2015 rose only slightly, while in October 2015 they shrank.

Ukraine: HeidelbergCement appoints Board Chairperson

Dnipropetrovsk-based HeidelbergCement Ukraine has appointed Silvio Thiede as the Board Chairperson, with effect from 11 January 2016.

Italy: Italcementi to shed stakes in Italgen

Italcementi's board has approved the sale to its parent company, Italmobiliare, of non-core assets, namely the stakes held in Italgen and Bravosolution and a property in Rome. Italgen operates in the renewable energy sector, while Bravosolution is active in e-procurement. The total value of the assets has been estimated at Euro241m. The sale is envisaged in the agreements signed by Italmobiliare with HeidelbergCement and will be completed once the deal between those two companies is finished.

UK: Cemex and Cape Industrial Services fined Euro1.74m following death of scaffolder

Cemex and Cape Industrial Services both pleaded guilty to health and safety violations after a scaffolder fell to his death at the Cemex cement plant in Rugby, Warwickshire in 2012. The companies have been fined a combined Euro1.74m.

John Altoft fell to his death after being struck by falling debris at the plant on 18 January 2012. The accident occurred when a team from Cape Industrial Services was installing an access scaffold to enable the relining of the inside of a 'steel plated tapered cylindrical structure' that forms part of the pre-heater tower.

Warwick Crown Court heard that the team was working inside the tower when a fall of heavy concrete debris caused Altoft to fall 7m to the bottom of the structure, suffering fatal head injuries. A colleague of his, Ty Smart, was also seriously injured. He suffered serious wrist and arm fractures and has been unable to work since the incident. A Health and Safety Executive (HSE) told the court that both Cemex UK Operations and Cape Industrial Services Scaffolding should have co-ordinated and planned the work to protect workers from the risk of falling materials.

Cemex pleaded guilty to breaching Section 3 of the Health and Safety at Work Act and was fined Euro938,539 and ordered to pay Euro121,719 in costs. Cape Industrial Services admitted breaching Section 2 of the Health and Safety at Work Act and was fined Euro804,684 and ordered to pay Euro121,747 in costs.

"If both companies had planned the work and managed the risks to the required standard, this incident would not have happened. This was an entirely preventable situation and proper planning and protection from the foreseeable danger of falling material would have prevented this tragedy," said HSE inspector Sue Thompson.

The Cemex cement plant in Rugby, Warwickshire, as seen from above.

Spain: Matteo Rozzanigo appointed as new President of the AFCA

The CEO of FYM, Italcementi's Spanish business, Matteo Rozzanigo, has been elected as the President of the Cement Manufacturers Association of Andalusia (AFCA), replacing Isidoro Miranda, the CEO of LafargeHolcim in Spain.

The AFCA is associated with cement manufacturers in Andalucia, namely FYM, Cementos Cosmos and Cementos Portland Valderrivas, in order to promote and support the industrial sector in the community and collaborate with the Public Administration to encourage the production and consumption of cement in Spain and abroad.

Rozzanigo will lead the proposals of the cement sector to boost activity in the region. After the severe crisis that has affected the sector in the last seven years, the development of the cement industry is considered key to economic recovery and job creation in Andalusia. The AFCA has stressed the need to continue working to improve the competitiveness and sustainability of the industrial sector.

Matteo Rozzanigo is an industrial engineer from the Polytechnic University of Milan. He developed his career in the industrial sector, mainly in Italcementi, where he has held various positions.

Matteo Rozzanigo is the new President of the AFCA.

Ireland: CRH spent Euro8bn on acquisitions in 2015

CRH spent Euro8bn on acquisitions and disposed of Euro1bn worth of assets in 2015.

The company made Euro430m from the sale of its clay and concrete products operations in the UK and its clay business in the US in 2015. It also gained about Euro530m through several additional divestments across Europe and the Americas. These included the sale of its 45% stake in French builders' merchant Doras and its 25% stake in Israeli cement producer Mashav. CRH had come under fire from some shareholders for retaining its stake in Mashav, as the company's cement has been used for a widely condemned security wall that divides Palestine and Israel.

During 2015, CRH completed 20 bolt-on acquisition and investment transactions. The company said that these deals, along with the acquisition of assets from Lafarge and Holcim, the CR Laurence acquisition and net deferred consideration payments, brought its development spend for 2015 to about Euro8bn.

"We are pleased with our progress in 2015, which brought cumulative proceeds from our multi-year divestment programme to almost Euro1.4bn, while our targeted bolt-on investments strengthened our existing businesses and complemented the major acquisition activity, which saw a total acquisition spend of Euro8bn in 2015," said CRH's Chief Executive, Albert Manifold. "Portfolio management, and in particular the reallocation of capital from low growth areas into core businesses for growth, is a cornerstone of our value creation model."

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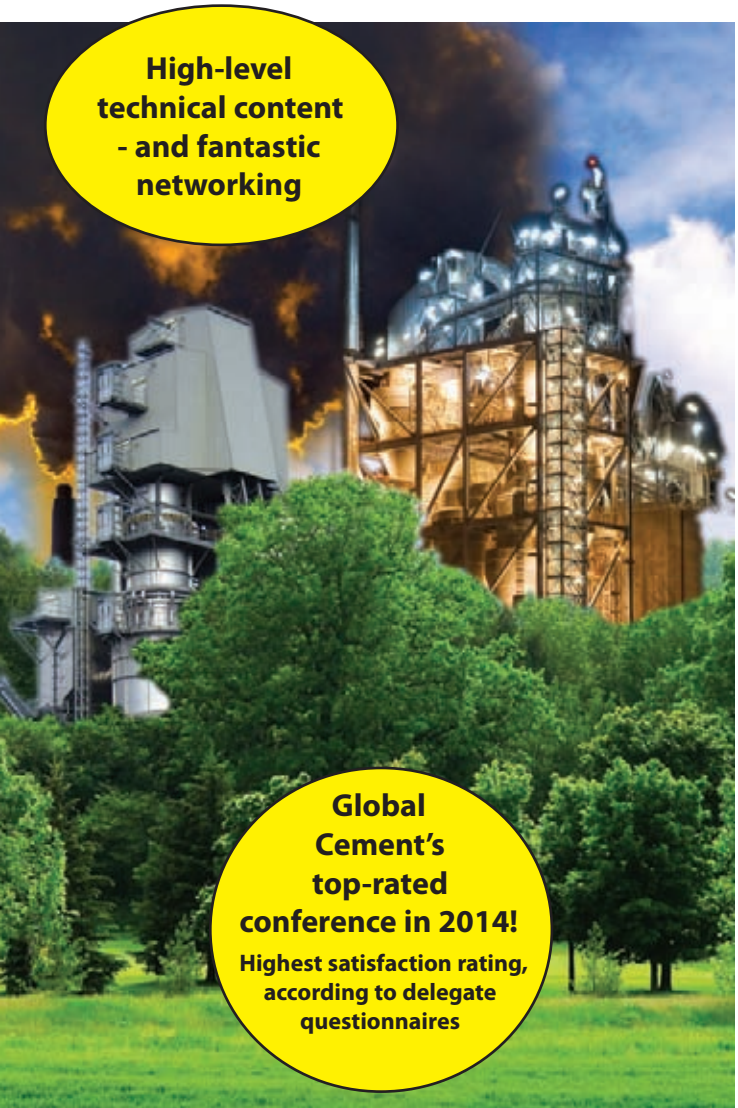

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- Congratulations, it was a good conference
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Belarus/Russia: Belarusian cement plants and Eurocement sign deal

Two Belarusian cement plants and Eurocement have signed an agreement for 2016, according to Yevgenia Filimonova, Press Secretary of the Belarusian Architecture and Construction Ministry.

The document was signed by Eurocement Group President, Mikhail Skorokhod, Director General of OAO Belarusian Cement Plant, Igor Lozhechnikov, and Director General of OAO Krichevcementnoshifer, Vladimir Korchevsky. The agreed volume of shipments is expected to satisfy demand for Belarusian cement on the Russian market. In addition, a working group was established to oversee pricing practices.

"For the last few years, we've been vigorously and fruitfully cooperating with Eurocement. I am convinced that the agreement will once again confirm the reliability and integrity of the partners," said Belarusian Architecture and Construction Minister Anatoly Cherny. Skorokhod said that he was glad to continue the cooperation with Belarusian manufacturers. "Belarusian cement manufacturers have been and remain our strategic partner," he said. The Belarusian cement plants and Eurocement started cooperation negotiations in 2012 and trade operations began in 2014.

World: White cement report published

A multi-client market report by OneStone Consulting S.L., of Barcelona, Spain was released on 15 December 2015.

According to the report, the white cement market has seen a recovery after years of slow growth. "The global annual growth rates are projected to increase from 2.5% in 2010-2015 to an average annual growth of 3.8% by 2020, with lowest growth in China," said Research Analyst Joe Harder. In 2015, global trade was improving. However, capacity utilisation rates of many producers remained low. New projects are in the pipeline, overcapacity issues will continue, prices continue to be under pressure and the global trade share is forecast to decline.

The White Cement Outlook 2020 report analyses the global white cement industry. The data includes global and regional markets, market trends, the installed production base of all producers, regional market shares of the major producers, net trade and total trade, regional imports and exports, consumption by countries, market drivers, price trends, economies of scale and various benchmarks of the top producers, including Aalborg, Birla White, Çimsa, Federal White, JK White, RAK White and Sotacib. In the new report the latest data is available with data sets for 2015. The market report provides a five-year projection with an outlook of the market to 2020, including regional production and consumption, per capita consumption cement trade, cement capacities and a number of identified white cement projects.

Denmark/Irleland: FLSmidth takes process and quality optimisation order from the CRH

FLSmidth has been awarded a contract for process and quality optimisation for 17 cement plants acquired by the CRH Group in 2015. FLSmidth's ability to deliver the large number of systems within 14 months was a factor in the order.

The order is the largest advanced process optimisation project ever awarded to FLSmidth and includes process optimisation of 12 kilns and 40 grinding mills, as well as quality optimisation of 14 raw mills. In addition, the order includes a service agreement, covering all 66 applications, where FLSmidth will provide support and ongoing remote monitoring and optimisation by its process specialists.

The contract uses FLSmidth's ECS/ProcessExpert and QCX/BlendExpert products. The ECS/ProcessExpert system aims to improve plant performance by stabilising the process of the plant, optimising the production, managing and correcting process disruptions and minimising wear on plant equipment.

The QCX/BlendExpert system controls the proportioning of raw material feed to raw mills to obtain the desired chemical product quality with respect to chemical constraints, process constraints and material costs.

CRH is the third largest building materials supplier in the world and has more than doubled its cement production volume due to the recent acquisition of 34 plants (including grinding stations), divested as part of the LafargeHolcim merger in 2015. Many of the plants are already using optimisation systems, but CRH chose to standardise on FLSmidth's ECS/ProcessExpert and QCX/BlendExpert solutions.

Turkey: Aşkale Çimento orders KHD grinding units for two plants

Aşkale Çimento has placed orders with KHD for new cement grinding systems at cement plants in Akoluk and Bilecik. Commissioning of both COMFLEX® systems is planned for the first part of 2017.

At Akoluk the new COMFLEX system will be installed in front of a new 100t/hr ball mill. At Bilecik the COMFLEX unit will allow Aşkale Çimento to increase the existing capacity from 100t/hr to 210t/hr at 3800 Blaine. Between 2006 and 2011 KHD supplied three kiln lines to Aşkale plants in Askale, Van and Gümüshane.

KHD's scope includes engineering as well as the supply of mechanical and electrical equipment. KHD will also supervise erection and commissioning of the new systems.

The core equipment of the COMFLEX SC16-3500 clinker grinding system includes: Roller Press RPS 16-170/180 with ROLCOX® system for control and monitoring; Cascade separator, type VS 618 as static classifier; High efficiency separator SEPMASTER, type SKS-VC 3500 as dynamic classifier; System fan HKSK 212/275.

With this new order KHD has now sold six COMFLEX plants in Turkey. Other COMFLEX systems are in operation in Denizli, KCS, Aslan and Batisöke.

The Global Cement Directory 2016

The Global Cement Directory 2016 is now available

- Up-to-date listing of all global cement plants*
- Cement grinding plant section
- Basic process information (wet/dry, number of kilns)
- Contact details: Telephone and Fax numbers
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Italy: Cementir Holding plans to buy Sacci's cement operations

The board of directors of Sacci has resolved to include Cementir Italia's offer for the acquisition of one of Sacci's business divisions as an integral part of Sacci's composition agreement with creditors, replacing the previous offer made by another industry operator.

The offer, which covers Sacci's operations in the cement, ready-mixed concrete and transport sectors, was submitted by Cementir Italia on 26 November 2015 and was declared to be binding on the condition that it was formally made an integral part of Sacci's composition with creditors by 31 December 2015.

Sacci's composition with creditors was submitted to the vote of the creditors at a hearing set for 18 January 2016. In early January 2016, the hearing was postponed to 21 March 2016 . If the vote by Sacci's creditors is favourable, it will then be subject to endorsement by the Court of Rome.

Sacci has five cement production facilities in the central and northern regions of Italy (Testi-Greve in Chianti, Castelraimondo, Cagnano Amiterno, Tavernola Bergamasca, and Livorno), three terminals in Manfredonia, Ravenna and Vasto, ready-mixed concrete plants mainly located in central Italy, a transport service and the equity interests in the consortium companies Energy for Growth, San Paolo and Fenicem.

The price of the acquisition was set at Euro125m and includes an initial component, which will be paid by Cementir Italia upon closing when the business transfer is made, and a deferred component, which will be paid 24 months after closing.

Cementir Holding will finance the transaction through new and existing credit facilities. The transaction is conditional upon several events, including the endorsement with creditors and authorisation from the Italian Anti-Trust Authority.

The acquisition would enable Cementir Holding to shift its focus of production and distribution towards central and northern Italy, covering new market areas with higher growth potential in the medium to long-term and greater profitability. It would also generate industrial synergies linked to the streamlining of the distribution network for the new facilities and those already belonging to the group, enabling it to respond to any recovery in the Italian market with a broader and more efficient industrial base. The largest synergies are expected to come from the operational side in the area of sales, purchasing and logistics.

The business division subject of the acquisition generated net revenues of around Euro98m in 2014. The closing of the transaction is expected in the first half of 2016.

Amy Saunders, Global Cement Magazine

Slow growth in the Czech Republic

The Czech Republic is a landlocked Central European nation bordered by Germany, Austria, Slovakia and Poland. The country encompasses 78,866km^2 of land and had an estimated population of 10.5 million in 2015. With its advanced economy and high standard of living, the Czech Republic has a healthy but slow-growing construction sector. To coincide with the *10th Global CemFuels Conference and Exhibition* taking place in Prague, Czech Republic in February 2016, *Global Cement Magazine* has compiled a report on the country's cement industry, including the latest developments and trends.

Economy

The Czech Republic's economy was badly hit during the financial crisis of 2008. After an initially-rapid recovery, the country returned to recession in 2012-2013. In 2014, however, the economy returned to growth (Figure 2). The Czech Republic's GDP grew by 2% year-on-year to US$205bn (official exchange rate) in 2014, while GDP/capita grew to US$30,000 from US$29,500 in 2013.[1] Inflation fell to 0.4% in 2014 from 1.4% in 2013. Long-term economic challenges highlighted by the CIA World Factbook include the rapidly-aging population, funding an unsustainable pension and health care system and diversifying away from manufacturing towards a more high-tech, services-based, knowledge economy.

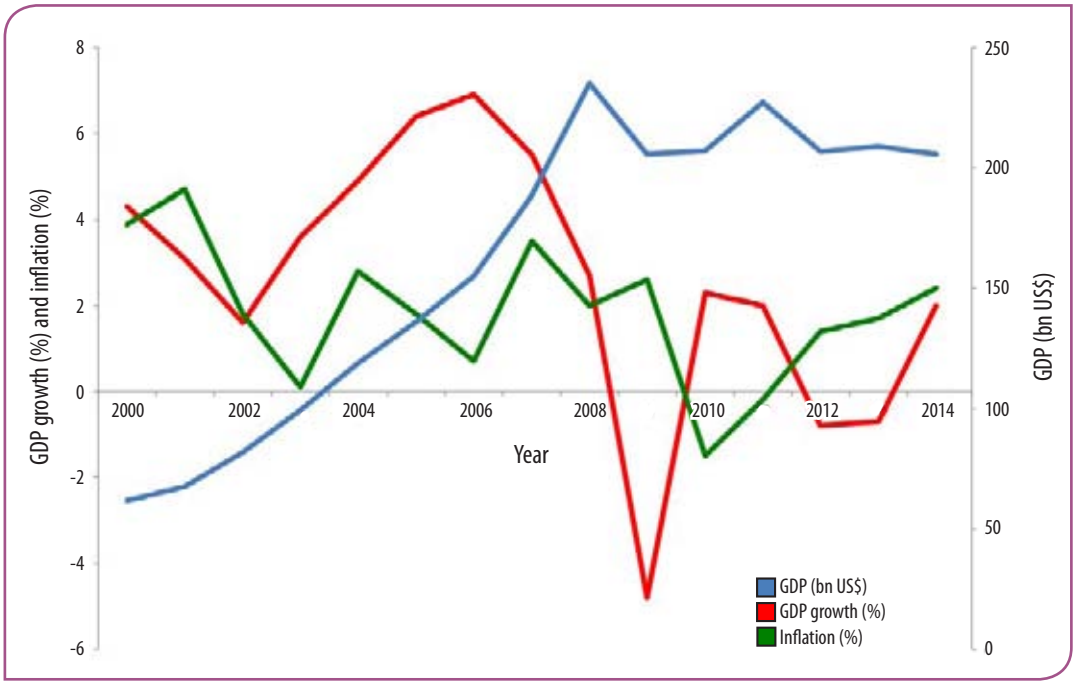
The country's 5.53 million-strong labour force works in the service sector (60%), industry (37.4%) and in agriculture (2.6%). Unemployment is reasonably low at 7.7%. Industrial production grew by 4.5% in 2014. The Czech Republic is a net exporter; in 2014, exports rose to US$111bn from US$102bn in 2013, while imports rose to US$102bn from US$95.9bn in 2013. Exports and imports were primarily machinery and transport equipment, raw materials, fuels and assorted chemicals.

Cement industry

The Czech Republic is home to four cement companies, all of which are multinational producers. The four companies operate five integrated cement plants with 5Mt/yr of cement production capacity, as well as one standalone grinding plant (Figure 3).

The minerals industry in the Czech Republic has shrunk in recent years as resources have been depleted and the country faced an economic slowdown.[2] Employment in the mining and quarrying sectors fell from 46,500 in 2011 to 43,000 in 2012. The industry contributed around Euro1.83bn or 1.04% to GDP in 2012, down from Euro2.38bn or 1.21% in 2011. The Czech Republic is home to a large number of registered reserved limestone deposits (Figure 4), in addition to a number of depleted deposits.

Right - Figure 1: Prague is the capital city and the largest in the Czech Republic. It is home to around 1.24 million people and has the lowest unemployment rate in the European Union.



Left - Figure 2: GDP (bn US$), GDP growth rate (%) and inflation rate (%) in 2000-2014 in the Czech Republic. **Source:** The World Data Bank.

According to the Czech Republic's Cement Manufacturers Association, the country produced 2.79Mt of cement and 2.09Mt of clinker in the first nine months of 2015, year-on-year increases of 6.22% and 3.01% respectively. During the nine months, domestic clinker sales rose to 12,715t from 0t in the same period of 2014 and domestic cement sales grew by 11.4% to 2.42Mt. Cement exports plunged by 99.9% to 87t and imports grew by 94.4% to 20,052t. Clinker exports fell by 11.3% to 402,134t and imports grew by 31.1% to 98,427t.

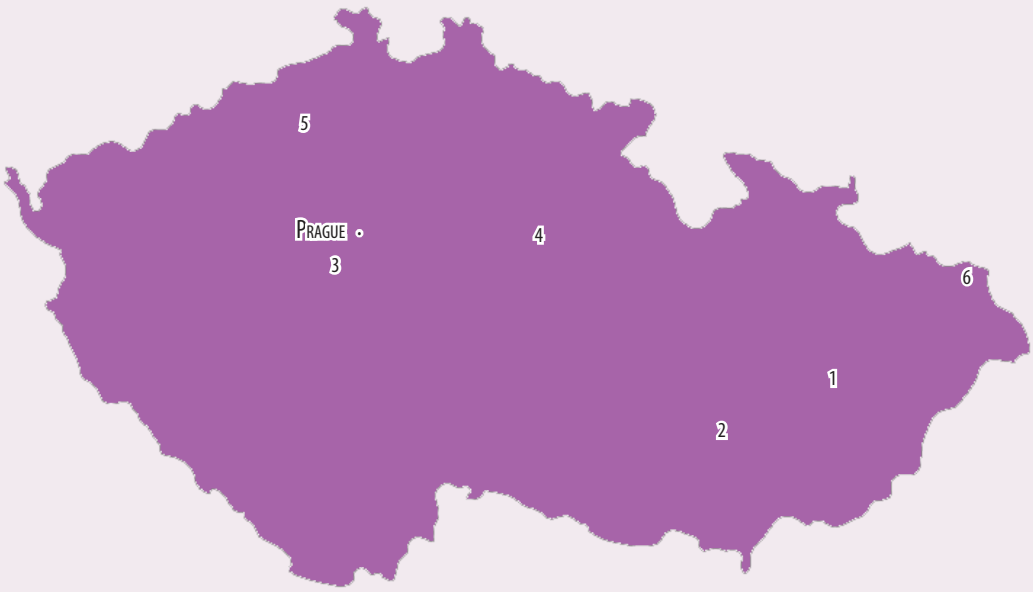
In the entirety of 2014, cement production grew by 9.3% year-on-year to 3.51Mt, exports rose by 0.8% to 602,000t and imports fell by 17.9% to 455,000t (Figure 5). Domestic cement consumption grew by 6.2% to 3.36Mt and per capita cement consumption rose by 6.3% to 320kg.

European Commission investigation

In August 2015 the European Commission (EC) closed an antitrust investigation that was originally opened in December 2010 against a number of cement companies, including Cemex, Holcim and HeidelbergCement.

The companies were suspected by the EC of colluding with rivals to fix prices in the Czech Republic, Austria, Belgium, France, Germany, Italy, Luxembourg, the Netherlands, Spain and the UK. The EC said that there had been indications that suggested possible import/export restrictions, market sharing, price coordination and information exchanges in the markets for cement, ready-mix concrete, clinker, aggregates, blast-furnace slag, granulated blast-furnace slag, ground granulated blast-furnace slag and fly ash. Inspections were carried out in November 2008 and September 2009 at the premises of cement companies in Germany, France, the UK, Belgium, the Netherlands, Italy, Luxembourg and Spain.

The EC concluded in August 2015 that the evidence obtained 'was not sufficiently conclusive to confirm these initial concerns,' adding that, 'the commission will continue to monitor closely developments in the European cement markets.'



Integrated cement plants — **Active capacity = 5.00Mt/yr**

1. Cement Hranice (Buzzi Unicem), Hranice	1.1Mt/yr
2. Českomoravský Cement (HeidelbergCement), Mokrá, Brno	1.4Mt/yr
3. Českomoravský Cement (HeidelbergCement), Radotín, Prague	0.5Mt/yr
4. Cemex Cement, Prachovice	0.9Mt/yr
5. Lafarge Cement (67.98% LafargeHolcim), Čížkovice	1.1Mt/yr

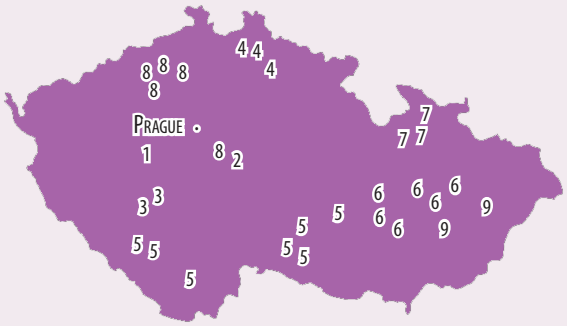
Grinding mills

6. Cemex Cement, Divize Cement, Edě, Dětmarovice

Right - Figure 3: Integrated cement plants and grinding mills in the Czech Republic in 2016. **Source:** *The Global Cement Directory 2016.*

Limestone deposits

1. Devonian, Barrandian
2. Paleozoic of the Železné Mountains
3. Central Bohemian Islet Zone
4. Krkonoše Mountains-Jizerské Mountains Crystalline Complex
5. South-Bohemian and Moravian Moldanubicum
6. Moravian Devonian
7. Silesicum and Orlické Mountains-Kladsko Crystalline Complex
8. Bohemian Cretaceous Basin
9. Outer Klippen Belt of the Western Carpathians



Right - Figure 4: Reserved registered limestone deposits in the Czech Republic in 2014. **Source:** http://www.geology.cz/extranet-eng/publications/online/mineral-commodity-summaries/MINERAL-COMMODITY-SUMMARIES-OF-THE-CZECH-REPUBLIC-2014.pdf

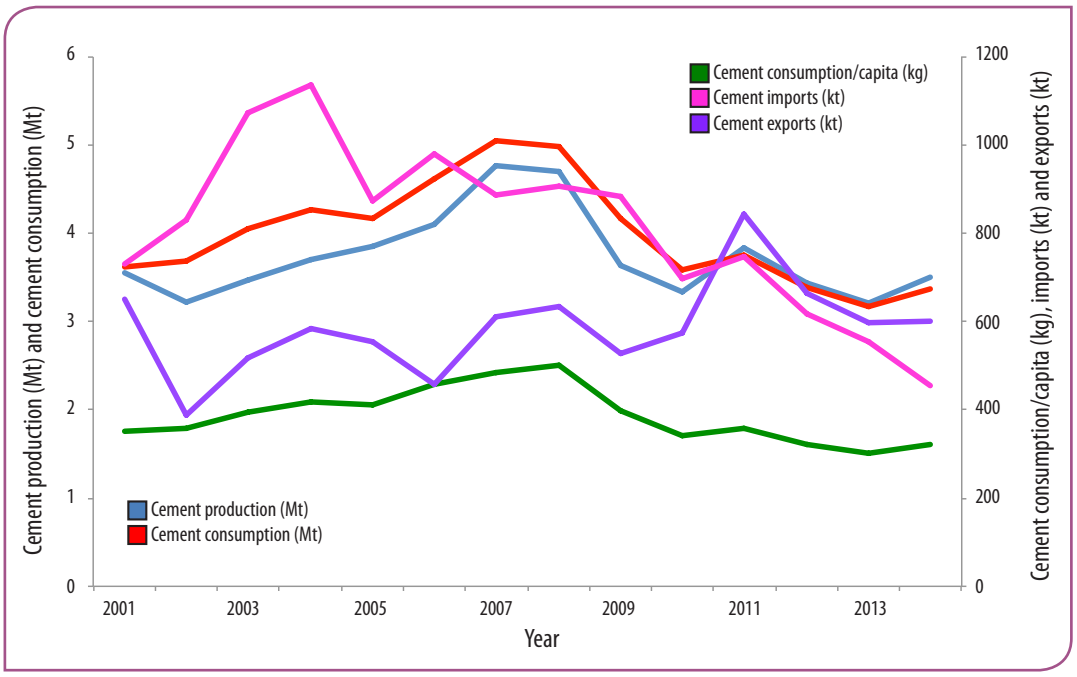
Českomoravský Cement (HeidelbergCement)

Českomoravský Cement, part of Germany's HeidelbergCement, is the largest cement company in the Czech Republic. It has two integrated cement plants in Mokrá and Radotín, which have 1.9Mt/yr of combined cement production capacity. Českomoravský Cement also operates a cement packing and shipping terminal in Králův Dvůr. It was formerly the Königshofer slag cement, Portland cement and lime plant. In 2003, cement production ceased and it has acted as a terminal ever since.

Českomoravský Cement was created in 1998 from the merger of Bohemia Cement and Cement and Lime. Today, Českomoravský Cement produces a variety of bagged and bulk Ordinary Portland Cements (OPC) and slag cement. It also imports CEM I 52.5R white cement for sale in the Czech Republic.

Českomoravský Cement's profit rose by 25% year-on-year to Euro27.2m in 2014, while its revenue grew by Euro3.69m to Euro102m. The positive results were attributed to the revival of the construction sector and favourable weather conditions. "The value of public contracts increased by 6.7% in 2014, so we can view 2015 with slight optimism," said Českomoravský Cement's Board Chairman, Jan Hrozek, at the time. The company supplied most of its products for the modernisation of the D1 motorway in 2014. Its other projects included repairs of concrete surfaces at the Vaclav Havel Airport Prague.

In the first nine months of 2015, HeidelbergCement reported that construction activity in the Czech Republic was boosted by the continued economic recovery, which resulted in an increase in cement sales. In its Eastern Europe-Central Asia operations, which includes the Czech Republic, its cement and clinker sales fell by 4.2% to 12.7Mt.



Left - Figure 5: Cement production (Mt), cement consumption (Mt), cement consumption/capita (kg), cement imports (kt) and cement exports (kt) in 2001-2014 in the Czech Republic. **Source:** The Cement Manufacturers Association of the Czech Republic.

Lafarge Cement (67.98% LafargeHolcim)

Lafarge Cement, in which LafargeHolcim has a 67.98% stake, operates one integrated cement plant in Čížkovice with 1.1Mt/yr of cement production capacity (Figure 6).

The Čížkovice plant was first constructed in 1898, although it has since seen many upgrades. In 1992, Lafarge bought a 12.5% share of the plant, which has expanded to reach 67.98% today. The plant has an alternative fuels substitution rate of 90%. Lafarge produces a variety of OPC and slag cements in the country.

A reviving building material market raised Lafarge's sales in the Czech Republic by 5% year-on-year to US$35.2m in 2014, according to company spokesperson Milena Hucanova. Profits from operations soared by 53% to US$6.55m. Hucanova attributed the growth to rising sales, an extraordinary revenue from the sale of carbon credits and operating savings. About 40% of the company's output was exported in 2014. Its investments in the Czech Republic in 2015 were estimated at US$1.09m.

Cement Hranice (Buzzi Unicem)

Cement Hranice has one integrated cement plant in Hranice with 1.1Mt/yr of production capacity (Figure 7). The plant started wet-process cement production in 1954 and in 1991 it switched to the dry process. In 1997, Germany's Dyckerhoff bought a majority share of Cement Hranice and in 2004, Buzzi Unicem acquired a controlling share of Dyckerhoff. Today, Cement Hranice produces bulk and bagged cements, dry mortars, adhesives and binders.

In 1987-1992 the plant underwent a Euro5.55m upgrade project that saw the installation of equipment to reduce dust, NO_x and SO_2 emissions, as well as the deployment of three-stage clinker firing with a pre-calciner. Cement Hranice uses alternative fuels to conserve natural non-renewable resources and to contribute to the ecological disposal of various wastes that would otherwise end up in landfills. To conserve the cement plant surroundings, thousands of trees have been planted and a system of water reservoirs has been installed. The plant purifies rainwater to

supply 83% of its water requirements.

Buzzi Unicem reported that in the first nine months of 2015, the growth of the Czech Republic's construction sector was satisfactory and that the company increased its capacity utilisation rate year-on-year. It said that, globally, its cement sales grew by 1.3% year-on-year to 19.2Mt, thanks in part to growth in the Czech Republic. However, it added that cement prices there fell slightly. In the country, Buzzi Unicem's net sales grew by 0.8% to Euro101m and its EBITDA rose by 28.3% to Euro24.7m in the first nine months of 2015. In addition, the company reported 12.7% lower fuels costs and 6.1% lower electricity costs.

Cemex Cement

Cemex Cement has one integrated cement plant with 0.9Mt/yr of cement production capacity in Prachovice, making it the second-largest cement company in the Czech Republic. It also operates a grinding plant in Edě, Dětmarovice. The company entered the Czech Republic in 2005 with the acquisition of the UK's RMC Group, including its Czech subsidiaries. Today it has 934 employees in the country and won the 'Best Employers Czech Republic, 2014' award. It produces a range of OPC, slag and limestone cement products.

In the first nine months of 2015, Cemex's global net sales fell by 7% year-on-year to Euro9.81bn (or grew by 6% on a like-for-like basis), its operating earnings before interest, taxes, depreciation and amortisation (EBITDA) fell by 1% to Euro1.81bn (or grew by 11% on a like-for-like basis) and its total cement sales grew by 1% to 49.6Mt. In Northern Europe, including the Czech Republic, its net sales fell by 22% to Euro2.12bn (or grew by 3% on a like-for-like basis), its operating EBITDA fell by 3% to Euro232m (or grew by 14% on a like-for-like basis) and its domestic cement sales volumes fell by 1%, although prices in local currency terms grew by 2%.

Cemex's global net sales grew by 3% year-on-year to Euro14.4bn in 2014. Its operating EBITDA grew by 4% to Euro2.51bn and its net loss narrowed to Euro464m from Euro771m in 2013. Although it didn't provide a breakdown of its results by region or country, Cemex's 2014 annual report said that, "The Czech Republic is a market with a strong economy and solid prospects and we expect the acquisition of assets will considerably reinforce our position in the country and in Central Europe." Cemex also said that it would sell up to Euro1.37bn of assets in 2015-2016, although it did not specify in which regions.

Cemex-Holcim deal

In August 2013, Cemex and Holcim reached a deal to conduct a series of transactions in Europe:

- Cemex would acquire all of Holcim's assets in the Czech Republic; the 0.9Mt/yr cement plant in Prachovice, four quarries and 17 ready-mix plants;
- Cemex would sell its assets in west Germany to Holcim, but retain its other German interests;
- Cemex and Holcim would combine all of their cement, ready-mix and aggregates operations in Spain. Cemex would have a 75% interest in the combined assets and Holcim would control 25%.
- Holcim would pay Cemex Euro70m in cash.

The transactions were expected to generate synergies that would result in a Euro18.3-27.4m recurring improvement in Cemex's EBITDA.

"This will be an important strategic step that should allow Cemex to improve its footprint in Europe. It will consolidate our portfolio on the continent," said Lorenzo H Zambrano, then-Chairman and CEO of Cemex (Zambrano passed away in May 2014). "This transaction will significantly strengthen our presence in Germany while at the same time giving us the necessary flexibility in Spain," said Holcim's CEO Bernard Fontana. "Overall, our footprint in Europe will be considerably strengthened."

In March 2014 the Office for Protection of Competition (UOHS) of the Czech Republic approved the deal. In November 2014 Cemex signed binding agreements with Holcim regarding the transactions, with some changes made to the Spanish operations. Under the new terms, in Spain Cemex would acquire

Right - Figure 6: LafargeHolcim's 1.1Mt/yr cement plant in Čížkovice. Learn more about the plant from Peter Edwards' plant visit report in this issue.

only Holcim's 0.85Mt/yr capacity Gador cement plant and its 0.9Mt/yr capacity Yeles grinding plant, leaving Holcim's other operations untouched. Additionally, the previously-announced payment of Euro70m to Cemex was changed to a Euro45m payment to Holcim. The transactions were completed on 5 January 2015 and on 1 March 2015, Holcim (Cesko) changed its name to Cemex Cement.

A series of management changes at Cemex was prompted by the transactions in March 2015. Hermann Dietrich was appointed as Cemex's Vice President for Strategic Planning in the Czech Republic and Slovakia. Henning Weber became the Vice President for Operation and Technology at the Cement Division, Mariusz Kostowski was named as the Trade and Logistics Director of the Cement Division and Justus Geiseler was appointed as the BSO Director. Lubos Merunka and Hana Fidrova, who were named as the Head of the Stone Aggregate division and the Company Lawyer respectively, both came to Cemex from Holcim after the deal. Cemex's General Director in the Czech Republic and Slovakia, Peter Dajko, said that the company was not planning any additional personnel changes in the foreseeable future.

In July 2015, Cemex announced that its acquisition of Holcim in the Czech Republic was expected to save it Euro7.38m. Cemex plans to invest Euro3.69m into the integration of management systems. One of the largest investments currently planned is the modernisation of the Prachovice cement plant.

Cemex's European asset divestments

In August 2015 Cemex signed an agreement for the sale of its operations in significant parts of Europe, including in Austria, Hungary, Croatia, Bosnia and Herzegovina, Montenegro and Serbia. This renders Cemex's operations in the Czech Republic a major proportion of its European assets.

Its assets in Croatia, Bosnia and Herzegovina, Montenegro and Serbia will be sold to Duna-Dráva Cement (HeidelbergCement) for Euro231m. The assets include three cement plants (which sold approximately 1.66Mt of cement in 2014), two aggregate quarries and seven ready-mix plants. Cemex's operations in Croatia, Bosnia and Herzegovina, Montenegro and Serbia had net sales of Euro124m in 2014.

Cemex's assets in Austria and Hungary will be sold to Rohrdorfer Group for Euro160m. The Austrian operations consist of 24 aggregate quarries and 34 ready-mix plants and had net sales of Euro217m in 2014. The Hungarian operations being divested consist of five aggregate quarries and 34 ready-mix plants and had net sales of Euro42.2m in 2014.

The proceeds will mainly be used for debt reduction. The closing of the transactions is subject to the satisfaction of standard conditions, including authorisation by regulators. Cemex initially expected to finalise the transactions in the fourth quarter of 2015, but it has now been delayed until early in 2016.

Outlook

According to the International Monetary Fund's (IMF) October 2015 outlook, the Czech Republic's GDP was expected to grow by 3.9% in 2015 and by 2.6% in 2016.[3] Construction output was expected to rise by 2.5% year-on-year in 2015, by 3.3% in 2016 and by 7.67% in 2020.[4] Growth in the sector will likely remain modest for the foreseeable future as public sector projects continue to be slow and private developers lack the confidence for significant investment projects.[5] This is expected to result in continued slow growth in domestic cement consumption, much the same as was reported by the Czech Republic's cement producers in 2014 and 2015.

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Amy Saunders & Peter Edwards, Global Cement Magazine

An update on Austria

Global Cement Magazine provides a summary of the Austrian cement sector to tie in with the location of the forthcoming *Global CemFuels Conference* in the neighbouring Czech Republic, which is also reviewed in this issue on pages 30-35.

The Austrian cement industry is fairly small, with nine active integrated cement plants and two grinding plants - See Figure 1. In May 2015, the Vereinigung der Österreichischen Zementindustrie (VÖZ), of which all plants are members, produced its annual review of the Austrian cement industry for 2014.[1] It said categorically that, despite the overall recovery of the European economy, Austria's cement industry had stagnated due to domestic factors.

For the whole of 2014, Austrian cement production grew by 1.1% year-on-year to 4.4Mt (Figure 2), which is down from a peak in 2008, when 5.3Mt was produced. This figure is lower than the country's 5.5Mt/yr capacity and represents a capacity utilisation rate of 80%.

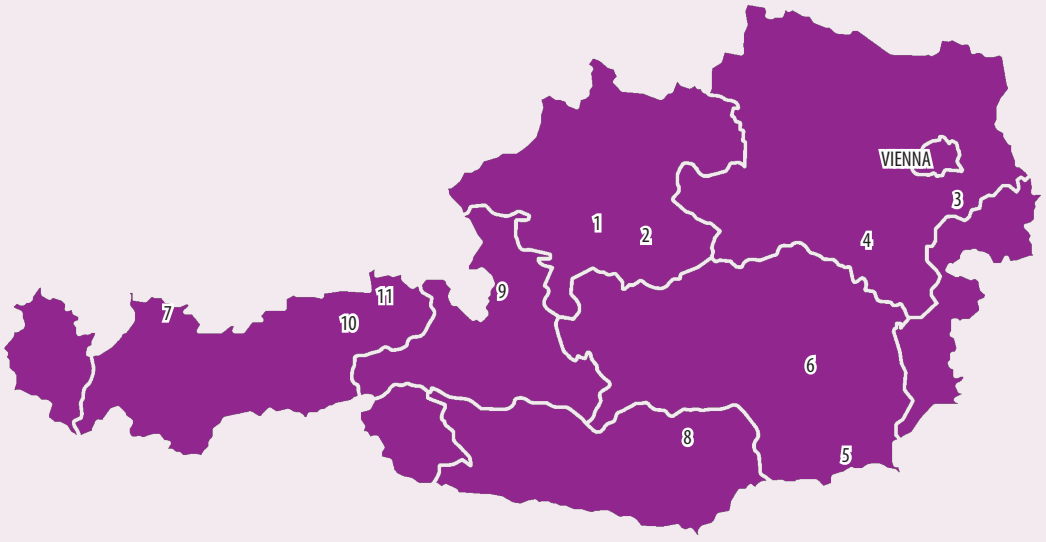
Austria has around 8.5 million inhabitants, giving it a capacity/population ratio of 647kg/capita/yr, which is fairly high by European standards.[2] In 2014 the country had apparent cement consumption of around 517kg/capita, assuming no imports/exports.

Cement sector

Austria has an unusual cement sector within the EU in that the majority of plants are not owned by major multinationals. Indeed, only three integrated facilities out of nine are run by multinational operators. The global cement industry leader LafargeHolcim operates two plants in Austria at Mannersdorf and Retznei and German regional player Rohrdorfer Group runs an integrated facility at Kirchdorf and a grinding plant at Eiberg.

Cement sector by producer

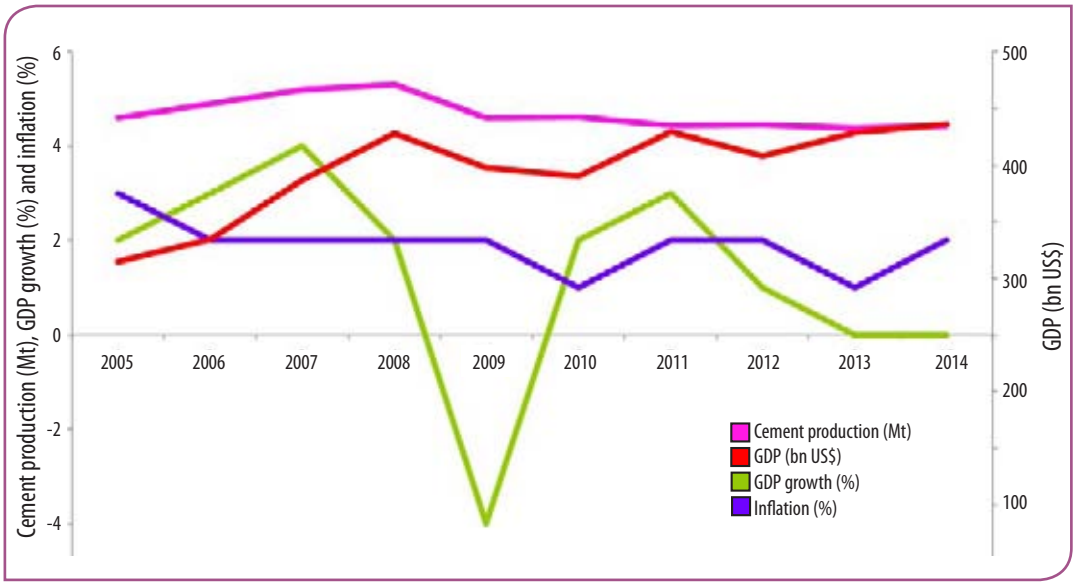
Lafarge Zement (LafargeHolcim) has a joint venture with Austria's Strabag, in which LafargeHolcim owns a 70% stake. The venture operates the 1.1Mt/yr Mannersdorf plant and the 0.5Mt/yr Retznei plant. With a combined capacity of 1.6Mt/yr, it is Austria's largest cement producer.



Integrated cement plants **Capacity = 5.5Mt/yr**

1. Gmundner Zement (Rohrdorfer Group), Hatschek, Upper Austria 0.8Mt/yr
2. Kirchdorfer Group, Kirchdorf, Upper Austria 0.5Mt/yr
3. Lafarge (LafargeHolcim), Mannersdorf, Lower Austria 1.1Mt/yr
4. Wopfinger Baustoffindustrie, Wopfing, Lower Austria 0.3Mt/yr
5. Lafarge (LafargeHolcim), Retznei, Stryia 0.5Mt/yr
6. Wietersdorfer & Peggauer, Peggau, Stryia 0.4Mt/yr
7. Schretter & Cie, Vils, Tyrol 0.3Mt/yr
8. Wietersdorfer & Peggauer, Wietersdorf, Carinthia 0.8Mt/yr
9. Leube Baustoffe, Gartenau, Salzburg 0.8Mt/yr

Grinding mills
10. Schretter & Cie, Kirchbichl, Tyrol
11. SPZ Zementwerke Eiberg (Rohrdorfer Group), Eiberg, Tyrol



Left - Figure 1: Austrian cement production (Mt), GDP (bn US$), GDP growth rate (%) and inflation rate (%) in 2005-2014. **Sources:** https://www.cia.gov/library/publications/the-world-factbook/geos/au.html, the VÖZ.

Privately-owned **Wietersdorfer & Peggauer Zement**, part of Wietersdorfer (formerly known as the Wietersdorfer Group), is Austria's second-largest cement producer by installed capacity. It owns two integrated cement plants in Austria. The plant at Wietersdorf, Carinthia, has a cement production capacity of 0.8Mt/yr, while the Peggau plant in Styria has 0.4Mt/yr of production capacity.

Germany's **Rohrdorfer Group** is active in Austria via **Gmundner Zement** and **SPZ Zementwerk Eiberg**. Gmundner Zement's Hatschek plant has a production capacity of 0.8Mt/yr and was purchased by Rohrdorfer Group in 2004. SPZ Zementwerk Eiberg, acquired by Rohrdorfer Group in 1995, operates a grinding plant in Tyrol. In November 2015 the group additionally acquired a number of Austrian aggregate and ready-mix concrete plants from Cemex, which has exited the Austrian cement sector.

Leube Baustoffe is a privately-owned Austrian producer of cement and other building materials. Leube operates a 0.8Mt/yr cement plant in Salzburg, from which it produced 486,000t of cement and binders in 2014, including white cement.

Privately-owned **Kirchdorfer Group** owns one cement plant in Kirchdorf, Upper Austria, with a capacity of 0.5Mt/yr. The company also supplies raw materials, finished parts and pre-fabricated homes to over 15 countries around the world.

Schretter & Cie owns the 0.3Mt/yr capacity Vils integrated cement plant in Tyrol and a grinding plant in Kirchbichl, Tyrol. It is a privately-owned company.

Wopfinger Baustoffindustrie operates a 0.3Mt/yr cement plant in Wopfing, Lower Austria. Wopfinger is a family-owned subsidiary of Schmid Industrie Holding.

Environment and fuels

The Austrian cement sector has some of the most stringent environmental regulations anywhere in the world. The VÖZ has compiled industry-wide sustainability reports with annual plant emissions for many years.[8] Dust, NO_x, total organic carbon (TOC) and specific CO_2 emissions have all fallen steadily since 2010 (Table 1), although SO_x, Cl, CO_2 and total metal emissions have grown during the same five-year period.

The fuels consumed by Austrian cement plants have changed significantly in the past five years (Table

Right - Table 1: Austrian cement industry emissions /t of clinker produced, total CO_2 emissions, specific CO_2 emissions /t of cement, alternative raw materials (ARM) and alternative fuels (AF) consumption /t of cement, thermal substitution and specific energy consumption /t of cement for 2010-2014. **Source:** http://www.zement.at/downloads/nachhaltigkeitsbericht__2014.pdf.

Year	Dust (g/t)	NO_x (g/t)	SO_x (g/t)	Cl (g/t)	F (g/t)	TOC (g/t)	Metals (g/t)	CO_2 (Mt)	Specific CO_2 (kg/t)	ARM + AF (kg/t)	Thermal substitution (%)	Specific energy consumption (MJ/t)
2010	11.6	912	64.4	3.30	0.207	97.1	0.095	2.442	574	397	62.8	2771
2011	8.7	890	50.1	3.32	0.198	81.2	0.094	2.467	557	412	65.3	2621
2012	6.8	810	57.8	3.95	0.227	73.6	0.122	2.494	560	446	68.4	2661
2013	8.6	835	76.7	4.07	0.250	85.2	0.114	2.456	560	479	72.4	2698
2014	6.9	776	101.3	5.71	0.252	71.6	0.180	2.462	555	485	75.5	2737

Right - Table 2: Fuel consumption by Austrian cement plants in 2010-2014. **Source:** http://www.zement.at/downloads/nachhaltigkeitsbericht__2014.pdf.

Fuel	2010	2011	2012	2013	2014
Coal (t)	124,17	101,02	98,980	83,848	77,043
Fuel oil (t)	8709	3188	1352	2835	1613
Petcoke (t)	20,969	35,845	30,325	31,465	29,543
Natural gas (m^3)	4179	4473	4543	2619	1873
Alternative fuels (t)	377,081	397,470	456,259	483,694	493,609
Electricity (MWhr)	486,59	507,73	510,72	513,56	497,92

Right - Table 3: Alternative fuel consumption by Austrian cement plants in 2010-2014. **Source:** http://www.zement.at/downloads/nachhaltigkeitsbericht__2014.pdf.

Alternative fuel	2010	2011	2012	2013	2014
Waste tyres (t)	27,088	33,967	37,305	40,245	47,903
Waste plastics (t)	203,211	233,317	273,733	277,909	293,502
Waste oil (t)	11,446	9625	6670	5935	7574
Waste solvents (t)	11,351	14,959	16,420	17,370	16,696
Agricultural wastes (t)	4598	4466	5654	3548	1492
Waste paper (t)	37,872	34,604	36,800	46,967	38,778
Other (t)	81,514	66,532	79,676	91,720	87,664

2). Coal consumption has fallen by almost a half during the period, while fuel oil use fell from 8709t in 2010 to 1613t in 2014. Natural gas use and electricity consumption also declined. In contrast, alternative fuel use rose from 377,081t in 2010 to 493,609t in 2014. By mass, waste plastics are by far the largest type of alternative fuel used in Austria, comprising 293,502t in 2014 (Table 3). This was followed by waste tyres (47,903t) and waste paper (38,778t). Alternative raw materials and alternative fuels consumption grew to a peak of 485kg/t of cement in 2014, while the industry's thermal substitution rate reached a peak of 75.5% (Table 1). Specific energy consumption rose to 2737MJ/t of cement in 2014, the highest in the previous five years.

Right: The new separator at Schretter & Cie's Kirchbichl grinding plant. Photograph shows the project during construction, prior to the erection of the housing.

Current projects

Austria's cement plants are at the forefront of continued development. Recent projects include a new separator at Schretter & Cie's Kirchbichl grinding plant, which was installed in 2015. This separator is a new development by the German-based Maschinenfabrik Köppern and replaces the old separator.

The new separator is operated in closed circuits with material from the ball mills (as before) but also from an FLSmidth High Pressure Grinding Roller (HPGR). The main features of the new separator are that it combines the static and dynamic separator sections in a very compact layout and that it has an optimised internal air and material flow. This means that it could be easily integrated into the plant's restricted buildings. Plant representatives report that the separator shows very good and promising performance both in product quality and output.

Outlook

The IMF's October 2015 forecast predicts that Austria's GDP will grow by 1.5% in 2016. In its 2014 report, the VÖZ expected the Austrian construction industry to grow by a similar amount to its GDP, by 1.3% in 2016, which is also significantly lower than the European average.[2] The association will present data for 2015 and review its forecasts for 2016 and 2017 later in 2016.

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Peter Edwards, Global Cement Magazine

Ramping up alternative fuels at Cemex Prachovice

The Cemex Prachovice plant has been in operation since the 1950s, first as a state-run wet-process plant. Since 1980 the plant has operated a single dry line. The plant was acquired by Holderbank (Holcim) in 1992 and, in January 2015, it was acquired by new owner Cemex. *Global Cement* recently visited the plant ahead of the field trip taken by delegates of the *10th Global CemFuels Conference & Exhibition* in Prague, Czech Republic. Peter Edwards spoke with Cement Operations Director Karol Czubara and Process Engineer Petr Gajdošík, who gave extensive details about the plant, its use of alternative fuels and how the change of ownership has affected the plant's day-to-day operations.

The cement plant at Prachovice has been making cement since the 1955. It was set up and owned by the state, as Czechoslovakia was a communist country at that time. The initial design included three wet process kiln lines, which operated throughout the 1960s and 1970s. They had a combined capacity of 0.6Mt/yr of cement.

In 1980 the kilns were replaced by one dry process line with a preheater tower from the Czech state company PSP, which is now part of IKN. In 1990 the plant was partly privatised after the revolution in Czechoslovakia and, like other plants, it was not long before a multinational producer stepped in.

In the case of Prachovice, the multinational was Holderbank, which later renamed itself as Holcim. It operated the plant until the end of 2014, when ownership was transferred to Cemex. This move was part of a wider asset swap between the two companies in Europe and was prior to the merger between Lafarge and Holcim.

Production and plant

The plant's captive limestone quarry is directly adjacent to the plant. There are currently seven benches. The plant is currently extracting materials from the seventh bench by blasting, which happens around once per week.

"We have many raw materials in the quarry," explains Director of Cement Operations Karol Czubara. "We have high-grade and low-grade limestone and some clay too. We also have materials that are not conducive to the cement production process such as shale, which contains a lot of sulphur. However, this can be used as an aggregate in road construction."

The plant has three raw material crushers, but only two are used for preparing material for the cement production process. The third is used to crush limestone for a third party lime plant.

"The two crushers are both hammer crushers from OKD. We run each at around 450t/hr," continues Czubara. "They are rated at 540t/hr so we don't need to run these all the time."

Next comes a 173m-long pre-homogenisation building. "We use the chevron method in our linear storage building," says Czubara. "It has a capacity of 55,000t and the scraper has a capacity of 450t/hr."

Right: View over the kiln at Cemex Prachovice.

Plant profile: Cemex Prachovice

Location:	Prachovice, Czech Republic
Founded:	1950
Dry production since:	1980
Current line since:	1980
Kiln:	PSP, 90m long, Ø = 5.6m
Line specification:	1.5-stage cyclone / shaft preheater, dry line
Capacity:	0.9Mt/yr

Left: Key facts about the Cemex Prachovice plant and its location within the Czech Republic.

The raw meal preparation area comprises two ball mills, 12m long by 4.4m in diameter. Both were, once again, manufactured by PSP at the time that it built the dry-process line. The nominal capacity of each is 160t/hr.

"Next we have our shaft/cyclone preheater," continues Czubara. "It is a very rare PSP design. It has a 'one-and-a-half' stage cyclone but the rest of the preheater is a shaft design. There are two streams, two shafts and two ID fans."

After that is the kiln, which is 90m long and 5.6m in diameter. This oversize design is also from PSP. "Past a PSP grate clinker cooler, we actually have only a very small clinker silo. It can only hold around 27,000-28,000t of clinker. This can complicate our situation and limits the speed with which we run the line if sales are low and the silo is already full."

Cement grinding is taken care of by two PSP ball mills. They are the same diameter as the raw meal mills but are 15m long instead of 12m.

There are six loading points for bulk cement for road distribution. The plant also has the ability to distribute by rail but does not do so often. Cement is also bagged and palletised on site by a Haver & Boecker Rotopacker and Beumer palletising system. Bagged cement currently represents around 10% of the plant's output.

Alternative fuels

The kiln at the Prachovice plant was designed for 2850t/day in the late 1970s. It was intended to run on heavy oil and gas. In 1994 it was converted to coal. The first alternative fuels, a few tonnes of solid recovered fuel (SRF), were tested in 1998. By the early 2000s the alternative fuel substitution rate had risen to around 20% based on using SRF and tyres.

Over the next few years the alternative fuel substitution rate was gradually increased, to around 30% in 2008. In 2009 the rate jumped to over 50% due to increased SRF supplies from Ecorec, a wholly-owned subsidiary of Cemex (and Holcim before it). Ecorec established an SRF production site 2km away from the plant in 2006, but took some years to fully ramp

"Our preheater has a one-and-a-half stage cyclone but the rest is a shaft design..."

Left: View of the Prachovice plant's preheater tower, an unusual one-and-a-half stage cyclone / shaft hybrid from PSP Engineering.

Above: Solid waste awaiting Ecorec's SRF production process.

Above right: A crane inside the Ecorec facility moves waste to the primary shredder.

Right: External view of Ecorec's 70,000t/yr SRF production facility.

up production. Since 2009 there has been a continued gradual increase in alternative fuel use to 57% in 2014 and then 63% in 2015.

"Today we use black coal as the 'main' traditional fuel. It is ground in a vertical roller mill from Gebr. Pfeiffer of Germany," continues Czubara. "Then we have 63% alternative fuels. By far the largest proportion of alternative fuels, around 60% of the plant's entire thermal energy, is from SRF."

Approximately 70% of the SRF used at Prachovice is produced by Ecorec. Its production plant has been on the same site as the cement plant since 2012. Before that Ecorec made SRF offsite. Ecorec can produce around 70,000t/yr of SRF. It takes in all sorts of waste, prepares it into SRF and feeds it to the cement plant via a tube conveyor. Ecorec also buys in around 30% of the SRF that the cement plant needs from other sources and stores it at its former plant.

The material used to make the SRF is sourced from within the region from five main suppliers and some smaller producers. Some material comes from as far away as Prague, around 110km to the west. Waste can be sourced directly from local companies, like a kitchen fitter who was unloading off-cuts from a recent job at the time of *Global Cement*'s visit.

Although the Ecorec facility has a theoretical capacity of 70,000t/yr, it is yet to realise this potential. "We are still getting the balance right between the proportions of Ecorec-made SRF and SRF from outside sources," explains Czubara. "In terms of cost, the fuels are comparable. However, Ecorec's fuel is of a better quality. Of course we have to keep external SRF coming to the plant in case the Ecorec facility goes offline for some reason or has a blockage."

Process Engineer Petr Gajdošík explains how the Ecorec facility is laid out. "Ecorec has one large primary shredder and two smaller secondary shredders, which are from Lindner recyclingtech. There are two sealed stores for the prepared material, which feed material via a tube conveyor directly to the kiln. Ecorec fills one up with SRF as Cemex empties the other, then we switch over the stores."

Aside from SRF, the cement plant also burns used whole tyres and waste oil and animal meal, when available. The plant also has an installation for chipped tyres but it is not currently used due to the price. "It is not a problem, as chipped tyres are more expensive than whole ones!" says Czubara.

The SRF, waste oil and coal go to the main burner and the plant feeds whole tyres to the bottom of the shaft preheater. Since mid-2015 the plant has also been feeding SRF at the kiln inlet. This represents around 5% of the entire fuel burn at present but it is hoped that this can be increased to around 10-15% with time.

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Right: Material ready for the primary shredder in the Ecorec SRF plant.

Far right: The two secondary SRF shredders in the Ecorec plant are from Lindner recyclingtech.

The future of alternative fuels

When asked how high he thinks the alternative fuel substitution rate could go at the Prachovice plant, Gajdošík answers with a smile. "Back many years ago, someone from the previous management said to me, '*You won't be able to get above 30%!*' Obviously we are now at double that level, so the moral of the story is to always approach alternative fuels with an open mind."

"In terms of the future, I think the realistic end-point for alternative fuels is 75-80%. We are already routinely in the top 10 Cemex plants worldwide for alternative fuel substitution rate. In November 2015 we were in the top five on the list."

Moving on to the potential barriers that may come in the way of taking the plant to 80% alternative fuels, Gajdošík identifies the kiln inlet burner as a major project that may be tricky in the absence of a precalciner. "There might be a future project with respect to modifying the preheater, not for the next year necessarily, but the preheater could become a bit of a blocking point in the longer-term."

"You always have to approach alternative fuels with an open mind..."

Emissions limits

The plant's emissions are limited according to EU-wide legislation. However, the plant uses continuous emissions monitoring systems to ensure that its actual emissions stay far below these. Limits and actual emissions of key pollutants are shown in Table 1.

"Regarding our NO_x emissions we have a selective non-catalytic reduction (SNCR) system, which was installed by Böhler Technik of Austria in 2014," says Czubara. "We have to use it around once per week at the moment to address small spikes in the emissions. Of course, our NO_x emissions are helped by the fact that we burn a lot of alternative fuels already. In the future we aim to increase these more, so NO_x should not be problematic going forward."

Products

The Prachovice plant makes nine types of cement, which includes types from CEM I to CEM V. The main type is CEM I 42.5R, which constitutes 60% of the plant's output. The other eight types are made less frequently, some as little as 5000t/yr. The plant also makes a product for road binder, which is used for stabilisation of the soil in highway projects.

Right: Storage area for correctives. As well as virgin resources, the plant uses alternative raw materials. Iron sources are obtained from local steel plants and sand comes from foundries and the glass industry. The slag used is dried on-site in a dedicated slag drier.

Far right - Table 1: Emissions limits and actual typical emitted values for major pollutants at the Cemex Prachovice plant.

Pollutant	Limit ($mg/Nm^3/yr$)	Typical value ($mg/Nm^3/yr$)
NO_x	500	470
SO_2	300	215
Dust	30	3
VOC	20	6
HCl	10	5

The asset swap

At the start of 2015, Cemex took over the Prachovice plant from the former owner Holcim as part of a larger European asset swap. This provided Cemex with its first cement plant in the country, which it has since been using to support its extensive ready-mix concrete operations. (Lafarge)Holcim also benefitted from the acquisition of former Cemex assets in the west of Germany.

As a near-30-year employee of the Prachovice plant, Petr Gajdošík is well placed to assess the changes that have taken place at the plant over the course of the first year of Cemex ownership. "For us on the ground, the changes have not been that big. Production increased in 2015 quite significantly compared to the previous year and the positive trend will continue in 2016 as well."

"The customer base has also changed. Cemex is the number two for ready-mix concrete in the Czech Republic and so we have more internal sales now. We also have our in-house transport arm Cemex Logistics, which transports bulk cement to the customer. We have also started clinker transport, which is ground at the Cemex Dětmarovice grinding plant. The clinker for that facility is transported by train."

Conclusion

Gradually improving market conditions in 2016 should help the Prachovice cement plant to raise production and provide opportunities to test its new alternative fuel burning capabilities, especially with respect to continued work on the kiln inlet burner. With a new alternative-fuels-savvy owner in Cemex, the Prachovice cement plant continues to look at ways to enhance its environmental credentials through the even greater use of waste-derived fuels.

Left: The Cemex Prachovice cement plant from a distance.

Interview by Peter Edwards, Global Cement Magazine

LafargeHolcim Čížkovice: A long history of production for a new group

The LafargeHolcim Čížkovice cement plant is located near a village of the same name in the north west of the Czech Republic. Over nearly 120 years of production, the plant, like many, has undergone major changes to fit the shifting requirements of the local market and to increase production efficiency. This included a very early switch, in 1910, to dry process production and more recently included the introduction of alternative fuels in 1997. Today the plant boasts one of the highest alternative fuel substitution rates in the world. *Global Cement* was recently able to visit the plant ahead of the field trip taken by delegates of the *10th Global CemFuels Conference & Exhibition* in Prague, Czech Republic.

History and introduction

***Global Cement (GC):* Can you outline the history of cement production at this site?**

Jiří Brokl, Process Manager (JB): The plant was established in 1898, pretty long ago. It started as a wet plant but what is quite interesting is that already by 1910, the plant was converted to produce cement by the dry process.

When the Second World War ended, the plant was nationalised, along with all industrial facilities in the former Czechoslovakia. Everything was state property but the plant and process were unchanged until the 1970s. At that point a new kiln, heat exchanger and much of the processing line was built or rebuilt.

In 1991, two years after the revolution in Czechoslovakia, the company became private once again and in 1992 the French multinational Lafarge entered the company. It was a very quick move by Lafarge but, then again, all plants were acquired pretty rapidly at that time.

For the plant it was good, because Lafarge made investments to improve performance on various levels. It invested in complete reconstruction of the kiln line, almost everything was new. The plant got a new clinker cooler in 1995 and a 100m high preheater in 1997. Lafarge also automated the plant properly for the first time. The line you see today is essentially that line from the 1990s. We added a urea dosing system for lowering NO_x in 2005 and upgraded the bagging and palletising system in 2008.

In 2015 the Čížkovice plant became part of the LafargeHolcim group, upon completion of the merger between Lafarge and Holcim.

Production process

***GC:* Can you take us through the production process as it stands in 2016?**

JB: Certainly. Our starting material is unique in that the marl and limestone in our quarry already has the

Right: Aerial view of the LafargeHolcim Čížkovice cement plant in the Czech Republic.

Plant profile: LafargeHolcim Čížkovice

Location:	Čížkovice, Czech Republic
Founded:	1898
Dry production since:	1910
Current line since:	1997
Kiln:	PSP, 72m long, Ø = 4.4m
Line specification:	5-stage preheater with calciner
Capacity:	1.1Mt/yr

Left: Key facts about the LafargeHolcim Čížkovice plant and its location within the Czech Republic.

right balance of minerals to make cement, albeit of a fairly low quality. To increase the quality of cement, we actually have to add corrective limestone, not iron, alumina or silica sources.

Christopher Ehrenberg, Plant Manager (CE): The material is also very easy to burn. When I first came to work at this plant, I heard old stories that all you need to do is lay the marl in the sun for a few hours and you got clinker!

JB: This is a great benefit logistically because we don't need to source additives from outside, except for synthetic gypsum from the desulphurisation process at power plants. We actually make the lime that is used in the desulphurisation towers as a side product, so materials go in a loop.

Back to the process, we extract the marl using three excavators and three dumpers and take it to a mobile hammer crusher from Krusnohorske strojirny. It has a capacity of 850t/hr. After that step the material is transported by a 2.5km belt conveyor to the plant site. Upon arrival it is taken to a secondary hammer.

To homogenise the raw meal, we don't actually have a traditional homogenisation silo. Due to the fact that material is already fairly homogeneous, we have nine normal silos. We fill one silo with raw meal and take the kiln feed from all of them. From a power consumption point of view, this is good. The homogenisation is reliable and to a standard that the downstream process can handle.

The preheater has five stages and is monostream, although the first cyclone stage is doubled. There is a calciner channel that was constructed in 1997. It underwent a significant lengthening project in 2013 to extend the residence time to over six seconds. The kiln is 1974 vintage from PSP Engineering. It is 72m long and 4.4m in diameter.

The clinker silo is very small, just 35,000t. Then we have two mills. For dispatch we have nine large silos and three loading stations for trucks, although we can also load to rails. We have a bagging machine that has 10 spouts and fills 25kg bags. There is also a palletiser from Beumer.

GC: **What types of cement are made here?**

Jan Špaček, Geocycle Resource Recovery Manager (JS): We have two types of clinker, from which we make a lot of different types of cement. Some are standard, some are 'to order.' We have normal clinker and reduced alkali clinker, with alkalis below 0.8. We only make CEM I from the reduced alkali clinker. It represents around 10-15% of production. The rest is cement based on our normal alkali clinker.

Alternative fuels

GC: **Can you describe the development of alternative fuels at Čížkovice?**

JB: The plant first started to use alternative fuels at the time of the new line from PSP. At first we used whole tyres at maybe around 2% substitution. In 2002 the plant took quite a big step, from heavy oil to lignite. At this point we started with solid shredded waste (SSW). The burner actually has a very large central pipe for this fluffy material.

In 2008 we installed receiving facilities for liquid wastes, which are not used at present. This included lipix, a dense residual from the production of edible oils in the past but market conditions mean that liquid fuels are hard to come by these days.

In 2010 we installed a waste receiving station for the calciner that we call Waste City Hall. We receive and mix it by loader. We have two weighfeeders from Schenck and a closed belt conveyor from Beumer Group that takes the blended material to the calciner. It is here that we take impregnated sawdust, rubber, plastic and whatever else we can secure.

In 2011 we completed a chloride bypass to increase the level of SSW in the system. In 2013, as I mentioned above, we prolonged the calciner significantly. It is a riser duct with a goose-neck. Due to this investment we obtained permission to use SSW in the calciner, which was a major advance.

GC: **What is the current fuel mix?**

JB: As of now we are burning lignite, SSW, impregnated sawdust and shredded tyres. On the main

Right: Unprocessed alternative fuels are mixed by loader inside Waste City Hall prior to firing in the calciner. The dark material in the centre is waste from contaminated oil ponds, a left over from past times. The other material shown is SSW.

Far right: "When you have material coming in at a specification of 'less than 20mm' in diameter and you get half a metre of tape or a massive wooden chair leg it is a problem. However, we are able to handle even this."

"We are able to use any alternative fuel that is available..."

Right: The plant can also use waste rubber seals, a by-product of the significant Czech motor industry.

Far right: The plant's liquid waste fuel handling facilities currently stand idle, ready for a change in the market.

burner we run lignite as the main fuel and SSW as a supplementary fuel. The burner also has a number of adaptations to burn animal meal (MBM) and a range of liquids. Around 60% of the calorific load is in the calciner, 40% in the main burner.

In terms of alternative fuel substitution rate we have increased significantly in recent years. We are at 100% alternative fuels to the calciner and overall we have a substitution rate of 90%.

GC: **That's really impressive. How much is SSW and how much are the other alternative fuels?**

JB: The SSW is around 50% of the alternative fuels and the other 50% is from other alternative fuels. I can't go too much into more detail because there is a competitive market for alternatives in the Czech Republic and it is also a rapidly changing situation.

GC: **How has the alternative fuel substitution rate changed over the years?**

JB: From a low percentage of tyres in the late 1990s we were able to introduce SSW in the early 2000s. This made for a rapid increase in the substitution rate to around 18% by 2000. By 2005 other fuels took the rate to 56%, to 68% in 2010 and to 90% in 2015.

JS: The really difficult step was going from 65-70% substitution up to 90% in the past two years or so. To do this we made not only the calciner modification but also installed a new belt dryer.

JB: The belt dryer is a short belt that is permeable to air. Waste air at around 90°C is taken from the cooler and is forced through SSW on the belt. The residence time of the SSW is 10 to 15 minutes and it takes the moisture content down to around 3% of the total weight.

GC: **What has been the most difficult fuel to burn?**

JS: We are able to burn all kinds of fuels but in general the higher moisture and higher particle size fuels are the most difficult.

JB: At the moment we only have solid alternative fuels and this can be a problem with respect to the size of

Right: The mixed alternative fuels from Waste City Hall are dosed to the calciner by two Schenck weighfeeders.

Far right: A massive snaking tube conveyor from Beumer Group takes the fuel mix to the calciner.

Left: SSW dosing equipment to the main burner.

the material. When you have material coming in at a specification of 'less than 20mm' in diameter and you get half a metre of tape or a massive wooden chair leg it is a problem. However, we are able to handle even this.

CE: A very important strength of the plant is that it can handle all kinds of different fuels, as soon as they become available in the market. The staff understand the production process very well, they understand the dosing requirements very well and this means that we can adapt quickly to rapidly-changing situations.

JS: We are able to use any alternative fuel that is available in the market.

GC: **Do the types of fuels that are burned change with the seasons at all?**

JS: No. We base our fuels on the cost it takes to get them. However, if we have to introduce a totally new fuel we need to get permission. That usually takes about 12 months.

GC: **Are there any more alternative fuel-related improvements coming for the plant soon?**

CE: It is well known that cement plants are suitable for burning some specific alternative fuels that meet certain parameters. The way we are able to do it is safe and at the same time environmentaly friendly. We have reached the ceiling in terms of alternative fuel substitution rate and we really can't go much higher. The focus now is on cost optimisation. In the future we have to focus on developing our ability to burn lower-quality alternative fuels. What does that mean? Fuels that are less prepared. This is why we installed the dryer belt and Waste City Hall. These investments mean that we can take on some of the processing steps that that waste processor might 'traditionally' do. Our fuel costs can be even lower.

"The really difficult step was going from 65-70% alternative fuels up to 90% in the past two years..."

Markets and distribution

GC: **Where is the plant's natural market?**

Left: View over the kiln at night with tertiary air duct and bypass.

Right: In the control room. At the time of *Global Cement*'s visit, the NO_x emissions from the plant were being reduced by a rare use of the plant's selective non-catalytic urea injection system. From January 2017, when NO_x emissions will be limited to 450mg/Nm^3 rather than the current 500mg/Nm^3, the plant staff anticipate a small increase in urea usage.

CE: Čížkovice is around 65km from Prague, but also very close to Germany so we also export cement to the German states of Bavaria and Saxony. The plant was in fact concieved together with German investors from Dresden to also serve the German market.

***GC:* What are the main types of customers?**

CE: Our two biggest customer groups are pre cast concrete manufacturers as well as ready-mix concrete producers but we also sell a significant amount of cement in bags to the retail market.

***GC:* How is demand for cement in the Czech Republic and south east Germany at the moment?**

CE: It is no secret that both the Czech Republic and this plant have overcapacities, so we have to run the plant to fit the conditions of the market.

Milena Hucanová, Communications Manager (MH): We expect slight growth in 2016, which we already saw a bit at the end of 2014 and also in 2015.

***GC:* In the longer term, will the market require full production from this plant again?**

CE: We hope so.

LafargeHolcim merger

***GC:* What effects have you seen as a result of the recent LafargeHolcim merger?**

MH: Overall we have seen positive changes so far. We are now part of an even larger group and can draw on experience from within that group. The technical population has more opportunities to exchange information than ever before. We have some new group plants that are quite close to us and it has been interesting to see how they are running the plant and what challenges they are facing.

CE: On a more day-to-day level we certainly see that things are moving forward following the merger. For example the group is currently evaluating the best tools and software to use in its plants around the world. Due to that there will be new software in the Čížkovice plant.

***GC:* What change(s) would you like to see in the Czech cement market to ensure the plant's future?**

MH: Outdated legislation causes great trouble during planning and execution phases of major infrastructural works and other projects. It is necessary to improve and speed-up the process of public procurement, which is currently administratively exhausting and prolonged. There is also an urgent need to eliminate never-ending problems with land purchases.

The start of Public Private Partnership (PPP) projects could help significantly, mainly via the civil engineering market. This would also be a great opportunity to start the construction of concrete roads.

Opportunities for the future include the completion of a network of expressways including the Prague City Circle, high speed railways, water management and flood-protection structures, as well as projects related to water retention. There are also social housing projects and renovations with a view to saving energy.

***GC:* Thank you all very much for your time!**

CE: You are most welcome!

Right: The marl and limestone quarry at Čížkovice is very well suited to the production of cement in terms of its chemical composition and burnability.

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US: Portland Cement Association celebrates 100th anniversary

The year 2016 marks the centennial anniversary of the Portland Cement Association (PCA), the US' leading advocate for America's cement manufacturers. Widely recognised as an authority on the technology, economics and applications of cement and concrete, the PCA is a vocal advocate for sustainability, economic growth, sound infrastructure investment and overall innovation and excellence in construction.

In celebrating its 100th year, the PCA will be involved with as well as hosting several events throughout the year, including:

- World of Concrete, Las Vegas, Nevada. The official launch of Centennial Celebration;
- PCA Spring Congress, Chicago. Main centennial celebration for PCA membership;
- 2016 DC Fly-In, Washington, D.C., Reception for Members of Congress, Congressional staff, agency officials and allied groups in conjunction with transportation fly-in.
- Open house at PCA Skokie headquarters and CTL Group to showcase campus to local politicians, government officials, local construction and business leaders, CTL Group clients and potential clients.

US: SRF plant breaks ground in the USA

A waste-to-solid-fuel plant has broken ground in West Virginia. Its developers say it is the US' first resource recovery facility that employs mechanical biological treatment (MBT).

The waste-to-solid-fuel plant in Martinsburg, West Virginia, called Entsorga WV, is expected to be operational in early 2017. Entsorga WV is a joint venture between Apple Valley Waste Technologies, Entsorga USA and Chemtex International.

By utilising the HEBioT MBT system, Entsorga WV will recover biomass, plastics and other carbon-based materials from the mixed municipal solid waste (MSW) stream and convert them into an alternative fuel. When processing the MSW, Entsorga WV will remove other recyclable commodities like ferrous and non-ferrous metals. The MSW received will be converted to solid recovered fuel (SRF), which will be used as an alternative to fossil fuels.

The plant will produce 50,000t/yr of SRF, which will be delivered to the Essroc Cement plant and used in conjunction with coal. The companies have entered into a long-term contract for the provision and acceptance of the SRF.

The reduction of waste that will be disposed of in landfills as a result of the Entsorga facility will result in a greenhouse gas emission reduction of 28,000t/yr of carbon dioxide equivalent. There are currently more than 330 MBT plants in operation throughout Europe, processing more than 30Mt/yr of municipal solid waste.

News in brief

Brazil: Cimpor suspends US$145m cement plant project

Cimpor has suspended its US$145m, 1.2Mt/yr cement plant project in Itaiacoca, Paraná due to the ongoing economic crisis in Brazil. The company has not disclosed any details about a new timetable for the project, but has confirmed that it is still in plans for expansion in the coming years.

Colombia: FLSmidth to supply mill system to Cementos Argos

FLSmidth and Cementos Argos have signed a contract for a new OK 33-4 cement mill system to be installed at a cement plant in Sogamoso, Boyac, Colombia. This marks the fourth OK mill purchased by Cementos Argos. The mill system will include cement storage, Ventomatic packing plant, MAAG gear, Airtech filters and auxiliary equipment.

Ecuador: Hormicreto orders two calciner burners

Hormicreto has ordered two calciner burners and a hot gas generator for its swing mill application, for alternative liquid fuels firing, with a thermal capacity of 5.2MW, including the complete fuel pumping, heating and valve train, from FCT Combustion for its cement plant in Cuenca, Ecuador.

Caribbean: Luis Ali named new Group Finance Manager of TCL

Trinidad Cement Limited (TCL) recently appointed Luis Ali as Group Finance Manager, effective from 4 January 2016.

US: One dead after accident at Continental Cement

One person is dead following an accident on 15 December 2015 at Continental Cement in Buffalo, New York. A worker at the quarry was struck by a boom on a tow truck and transported to the hospital with head trauma. He later died at the hospital. The incident is being investigated by the Mine, Safety and Health Administration, the Scott County Medical Examiners Officer and the Buffalo Police Department.

Mexico: Elementia pays remaining US$45m for Cementos Fortaleza

Mexican construction group Elementia has paid the final US$45m instalment for the acquisition of a 47% stake in Mexican cement producer Cementos Fortaleza from Switzerland's LafargeHolcim.

Cementos Fortaleza was a joint venture company formed in 2013 by Elementia and Lafarge prior to the latter's merger with Holcim. Lafarge agreed to sell its stake for US$225m in 2014. Elementia was required to pay 80% of the purchase price, or US$180m, in December 2014 and the remaining 20% in December 2015.

Paraguay: Cimpor Cimentos sells its 16% stake in Yguazu Cementos

Portugal's Cimpor Cimentos de Portugal has sold a 16% interest in Yguazu Cementos, a Paraguay-based producer of cement, for US$35m.

With the conclusion of the deal, Cimpor will retain control of Yguazu Cementos with its remaining 51% stake. The transaction will allow Cimpor to strengthen its capital structure, increase profitability and to focus on its strategic development.

US: Demand for fibre cement products set to grow

US demand for fibre cement products is forecast to grow by 5.8%/yr until 2019 to 270Mm^2 (2.9Bnft^2), valued at US$2.2bn.

Accelerating construction expenditures, specifically in new housing, will spur demand for the construction material product. Siding is by far the largest application for fibre cement and demand will benefit from the popularity of fibre cement sidings in the south and west of the US, the regions that will experience the strongest growth in population and housing starts in the future. These and other trends are presented in 'Fiber Cement,' a new study from The Freedonia Group, a Cleveland-based industry market research firm.

The residential market accounts for the majority of fibre cement demand. According to Construction Group Leader Tom Bowne, while new housing demand for fibre cement products will rise at the fastest pace through 2019, residential improvement and repair will continue to account for a larger portion of residential demand. Sales of existing housing will generate demand for fibre cement products as homeowners look to increase the value of their properties before going to market.

Exterior fibre cement products have seen increasing use in the non-residential market in recent years, particularly in the form of fibre cement backer-board products. Fibre cement product demand in the non-residential market is forecast to grow by 5.4%/yr until 2019 to 62Mm^2 (670Mft^2). Rebounding non-residential building construction demand will primarily drive gains. In addition, fibre cement siding and exterior trim will benefit from a design trend in commercial buildings that favours an exposed-wood appearance for exteriors. Fibre cement product manufacturers have responded to this demand by developing new wood-like products aimed at commercial buildings.

Siding accounts for over 70% of fibre cement product demand. Fibre cement manufacturers have found a great deal of success in this application, managing to penetrate a competitive market and becoming a major material option in siding over the course of a couple of decades. Backerboard is the second-largest application for fibre cement in the US and is expected to post above average growth in the forecast years.

US: Lone Star working with IDEM to track unauthorised dumping in landfill

The unauthorised dumping of a non-hazardous waste material in a landfill meant for cement kiln dust has prompted a state environmental investigation of Lone Star Industries' Buzzi Unicem USA in Greencastle, Indiana.

Lone Star has been cooperating with the Indiana Department of Environmental Management (IDEM) on the reported dumping, which occurred in the summer of 2015, of more than 300t of wastewater treatment filter cake intended for use as an alternative raw material in the cement kiln.

The environmental impact of the dumping remains unknown, according to the IDEM. "That is a part of the investigation that is still ongoing," said the IDEM's Barry Sneed. "We are working to understand the composition of the materials and their chemical make up, the relationship between the disposal areas and existing groundwater monitoring devices on site, as well as existing surface water management devices. At this point we are not aware of any groundwater impacts."

The material was reportedly removed from a storage building and placed in the landfill between 27 August 2015 and 25 September 2015, according to a letter to the IDEM submitted by Lone Star Industries' Plant Manager, John Kass. A letter dated 16 October 2015 to the IDEM from Kass said that the internal investigation at Lone Star Industries began on 28 September 2015. Employees had reportedly made telephone calls to the IDEM from 23 September 2015 about the unauthorised dumping. Kass wrote that the company attempted to recover the material. It did recover about 39t from the quarry reclamation area.

Kass said that the incident was 'a misguided effort by two supervisory personnel to free up space' in a storage area. The employees involved were placed on indefinite suspension without pay, pending the investigation, according to Kass. A follow-up letter to the IDEM on 17 November 2015 revealed that another unauthorised dumping of the same material had occurred in early 2012. That material was located and recovered.

Kass said that, since October 2015, the company has met with all supervisors and most employees to conduct refresher training for the management of alternative fuels and raw materials. "I am personally distressed that these activities occurred," Kass wrote, "I am just as distressed that no one reported them to me, or to either of the Plant Environmental Engineers. Had they done so, I am sure the activities would have been dealt with immediately, as they were in late September 2015 when we first learned that this had been done."

News in brief

India: Jaiprakash to sell Jaypee Bhilai stake to Shree Cement

Jaiprakash Associates has signed an agreement with Shree Cement to divest its stake in the 2.1Mt/yr Bhilai Jaypee Cement plant for US$314-329m. Jaiprakash Associates is finding it difficult to service its debt for various reasons, including an economic slowdown and some of its projects failing in terms of revenue generation.

Thailand: Siam City Cement's CEO to resign

Vorathep Rangchaikul will resign from the position of CEO at Siam City Cement. The resignation takes effect from 7 April 2016.

India: Petron Engineering wins Ramco Cements contract

Petron Engineering Construction has received a Letter of Intent from Ramco Cements for civil and mechanical works to upgrade line 1 at the cement plant and captive power plant at Jayanthipuram, Andhra Pradesh for US$3.36m.

Nepal: US$140m plant proposal approved

The Investment Board of Nepal (IBN) has approved a US$140m investment proposal by a Chinese company to set up a cement plant in the country. The company is looking for a site in the eastern, central and western regions to set up the 1.1Mt/yr plant, according to IBN's CEO, Radhesh Pant.

India: Prism Cement appoints Joydeep Mukherjee as CEO

Prism Cement has appointed Joydeep Mukherjee as its Chief Executive Officer (designate) and Key Managerial Personnel with effect from 16 December 2015.

China: TCC expects 2015 loss

TCC International expects to swing to a net loss for 2015 from a net profit of US$265m in 2014. TCC said that the expected loss was due to a 26% decline in the average selling price of its cement products and the weakening Chinese Yuan against the US Dollar during the year.

India: Andhra Cements acquisition talks intensify

Sagar Cements is in advanced talks to buy Jaypee Group's Andhra Cements. JSW Cement is another potential contender. The enterprise value of the deal is expected to be around US$162-169m, a steep discount of about 30% in comparison with recent cement deals.

Andhra Cements has two plants in Andhra Pradesh with a combined cement production capacity of 2.6Mt/yr. It also has a 25MW captive power plant under construction. It had a debt of US$118m at the end of its 2015 fiscal year. If the deal transpires at US$162m, it will translate into an enterprise value of US$64/t of cement capacity. This is lower than the average valuations of US$100/t of the recent deals in the sector.

"We would like to clarify that, though the company does hold discussions internally now and then in an informal way on expanding its operations through organic and inorganic routes, no particular entity has yet been identified for a possible acquisition," said an Andhra Cements spokesperson.

For Sagar Cements, the deal presents several long-term synergies. The acquisition would enhance its current capacity of 3.8Mt/yr by 2.6Mt/yr. Secondly, Sagar Cements would add the capacity at a time when the creation of two new states, Telangana and Andhra Pradesh, is expected to generate an incremental cement demand of 30Mt in the region in the next five years.

China: China Resources Cement expects 2015 net profit to have plunged

State-owned China Resources Cement said that it expects its 2015 net profit to have fallen sharply year-on-year due to lower selling prices and exchange losses from foreign loans, following dismal data for the first nine months of 2015.

Its net profit for the first nine months of 2015 fell by 60.6% year-on-year to US$165m, as its exchange loss from non-Chinese Yuan net borrowings surged four-fold year-on-year to US$83.8m. Cement and clinker also suffered from narrow gross margins of 24.1% and 11.3% for the nine months that ended on 30 September 2015 compared to 34.6% and 13.9% from the same period of 2014.

India: New complaint against India's producers

The Competition Commission of India (CCI) is examining a fresh complaint of alleged unfair business practices made against cement makers, according to CCI chairman Ashok Chawala. The development comes against the backdrop of the quashing of a US$949m fine imposed on them by the regulator in a previous case.

The Confederation of Real Estate Developer's Associations of India (CREDAI), which has about 10,000 members, approached the CCI against the Cement Manufacturers' Association (CMA) in September 2015. In October 2015, the CREDAI said that the association had filed a complaint against the CMA as prices have risen sharply despite low demand for cement.

"To control the cost of construction and make home prices work for the common man, the CREDAI has moved the CCI against cement manufacturers who have been unduly increasing the cost of cement," said the CREDAI. Despite low demand, the association said that cement prices had jumped by 20-40% in major cities across India since October 2015.

Indonesia: ABB wins order for PT Semen Bosowa

ABB, a power and automation technology group, has won an order from Tianjin Cement Industry Design & Research Institute Co. Ltd, a subsidiary of Sinoma Group, for a variable-speed drive solution for a dual pinion ball mill at the PT Semen Bosowa Maros cement plant in Indonesia.

The equipment will be delivered in March 2016 and commissioned in the third quarter of 2016. ABB was selected for the project because the end customer is satisfied with earlier deliveries for the first grinding line at the plant, including a gearless mill drive (GMD) and a vertical mill with ABB slip ring motors.

"ABB's solution was favoured for several reasons, not least because of the high level of efficiency offered by the permanent magnet motors used and the absence of a gearbox in the system, which maximises availability and reliability," said Rachid Hamdani, Project Director of PT Semen Bosowa Maros.

Tajikistan: Cement exports commence to Afghanistan

Tajikistan has reportedly started to export cement to neighbouring Afghanistan.

According to the press centre of the Customs Service under the Government of Tajikistan, 12 trucks carrying 370t of cement proceeded via the Panji Poyon border crossing on the Tajik-Afghan border in late December 2015.

Huaxin Gayur Cement Co., Ltd in Yovon, Khatlon reportedly signed an agreement with the Afghan construction company Shamal Sharq in early December 2015 to supply 500t of cement to Afghanistan.

India: Emami Cement orders third Gebr. Pfeiffer mill

Emami Cement has awarded three recent orders for mills to Gebr. Pfeiffer. The first Gebr. Pfeiffer mill is for its greenfield cement plant in Chhattisgarh, which is currently under construction. The second is destined for a standalone grinding unit in West Bengal. This order is currently being processed.

The latest mill order is for a grinding plant in Odisha. The order covers a MVR 6000 C-6 mill with an installed drive power of 6700kW. This mill will be capable of producing 335t/hr of ordinary Portland cement (OPC). The grinding plant will be designed in a way to allow fly ash cement and granulated blast-furnace slag to be ground to a fineness of 3800cm^2/g and 4000cm^2/g according to Blaine, respectively.

The MVR 6000 C-6 mill, with its six rollers, has an actively redundant system. In case of an unplanned outage of one grinding roller, it allows the mill to continue in operation with four rollers while the roller swung out of the mill is being worked on outside of the mill. When it comes to cement grinding, where regular and planned maintenance works are scheduled for the regeneration of the grinding elements, this concept offers the customer the option to carry out maintenance works on two rollers outside the mill while at the same time cement can continue to be produced, albeit at a somewhat lower capacity.

Thanks to the modular design of the MVR mills, the essential components, such as bearings, seals of the grinding rollers and the tension system, as well as the gear units of the mill main drive, will be designed so as to be identical to the parts of the MVR mills that have been supplied to Emami Cement previously, i.e. an MVR 6000 R-6 and an MVR 6000 C-6. This will enable Emami Cement to manage with a small pool of strategic spare parts, which can be used with all the MVR mills.

Gebr. Pfeiffer SE will supply the core components of the mills and the gear units from Europe. Its Indian subsidiary, Gebr. Pfeiffer (India) Pvt. Ltd., will provide components such as the housing of the mill and classifier, the steel foundation parts as well as all static and dynamic interior parts of the classifier and, in addition, supply some of the equipment required to complete the grinding plant. Moreover, the Indian subsidiary will do the plant layout and advise Emami Cement on the equipment it must procure itself.

China: Capacity utilisation at 65%

China's cement industry has been trapped in sharp profit decline and its capacity utilisation has declined to 65%, according to a report from Economic Information Daily.

Industry insiders believe that previous high speed development has led to oversupply of cement and that closing obsolete cement capacity and promoting mergers and restructures will be the new orientation for the industry. At least 500Mt/yr of low-grade cement capacity will be eliminated.

The number of loss-making cement companies has reached 1339 and accounted for 40% of the total, according to Kong Xiangzhong, Executive Vice President and Secretary General of the China Cement Association. Cement companies lost US$2.63bn in the first three quarters of 2015 and among the profit-making producers, many were suffering 'invisible losses.'

India: Cement Corporation of India to be revived

The Government has prepared a revival scheme for the Cement Corporation of India (CCI). The scheme, which was approved by the government and ordered by the Board for Industrial & Financial Reconstruction (BIFR), envisages the expansion and modernisation of three operating units and the closure and sale of seven non-operating units.

Out of the seven non-operating units, six units have been closed with effect from October 2008. The Adilabad unit could not be closed due to an interim order of the High Court of Andhra Pradesh. Action for the expansion and modernisation of the operating units was taken. However, the results of the entire scheme for revival of the CCI could not reach the desired level because of the non-sale of the assets of non-operating units of the company, which has caused a shortage of funds.

India: LafargeHolcim to exit

Lafarge India has submitted a revised proposal to the Competition Commission of India (CCI) to sell its entire 11Mt/yr of cement production assets in India.

The decision comes after the company's plan to sell its 5.15Mt/yr cement capacity in Chhattisgarh and Jharkhand to Birla Corporation for US$749m ran into trouble. Investment bankers said that Birla Corporation was facing challenges in securing limestone mining rights for the two units.

In order to approve the LafargeHolcim merger in India, the CCI had asked Lafarge India to sell its 5.15Mt/yr of capacity in eastern India by 31 December 2015. In August 2015, Birla Corporation agreed to buy the assets along with brands Concreto and PSC and mineral rights for adequate reserves of limestone. The deal was conditional on Birla Corp being able to secure mining rights that Lafarge had.

"Lafarge India has sought an extension of its deadline from the CCI to complete its divestment," said an unnamed investment banker. "Lafarge India has now put the entire company on the block, as the sale of the entire company will include transfer of mining rights."

Vietnam: Farmers use cement as fertiliser for rice

Vietnamese farmers in many localities have used cement as fertiliser for their rice fields after a farmer in Lai Vung, Dong Thap said that the move had helped him raise his yield.

Several months ago, when building a new house, Le Van Nuoi from Long Hau noticed that vegetables planted near a place where building workers washed their utensils grew well without any fertiliser. Nuoi thought that the vegetables developed thanks to the mortar and cement stuck on the utensils of building workers.

Nuoi made a test with rice. He put down urea mixed with cement on a small area of rice and discovered that the rice in this area grew better than others in the same field. Nuoi's initiative was transferred to other farmers in the region, who have reached the same conclusion as Nuoi.

Mai Quoc Hau, Head of the Agriculture and Rural Development Division of Lai Vung, said that the local authorities have known about the local farmers' initiative. The division has sent experts to work with the farmers. He said that he would report the case to the higher authorities for consideration because using cement as fertiliser was 'very strange.' Experts have warned that spraying cement on rice fields will make the land unsuitable for crop cultivation.

Uzbekistan: Ahangarancement increases cement production by 4.1%

Eurocement's Ahangarancement JSC increased its cement production by 4.1% to 1.77Mt in 2015. Its clinker production grew by 3.4% to 1.28Mt. In 2015 the company sold 1.77Mt of cement, a 3% year-on-year increase.

Iran: Gas shortage cripples 35% of Iran's cement production

About 35% of Iran's cement kilns, or 30-35 of a total of 97 kilns at 71 cement plants, are not working due to the gas shortage and technical problems, reported Abdolreza Sheikhan, Secretary of Iran's Cement Industry Employers Association on 2 January 2016.

Iran's cement sector is suffering a gas shortage, according to Sheikhan. He said that the country's cement output has decreased by 10-12% in 21 March 2015 to 21 November 2015. Sheikhan has forecast that Iran's annual cement output will fall by some 12% compared to the preceding fiscal year, which ended on 21 March 2015. During the year, Iran produced over 61Mt of cement.

The National Iranian Gas Company has stopped supplying gas to a number of cement plants due to a wave of cold weather. However, the ongoing problem is not due to output shortage, but because of a delay in inaugurating a projected compressor station, according to Iranian media. It was already planned that the country's gas transmission capacity would increase by 80Mm^3/day in 2016 by installing five compressor stations en route to the transmission pipeline, but the stations have not become fully operational yet.

China: Shanshui Cement takes over 100 plants from Shandong Shanshui

Shanshui Cement took over 100 factories that belonged to Shandong Shanshui, including the Shandong Cement Factory, as of 31 December 2015.

At the time, 'the former directors of Shandong Shanshui, namely Zhang Caikui, Zhang Bin and Huang Kehua, still illegally occupied the head office and five factories of Shandong Shanshui and illegally retained important documents, including but not limited to, seals, chops and books,' according to local media. As the company documents were illegally retained, the Jinan Administration for Industry & Commerce refused to proceed with the application for the change of directors of Shandong Shanshui.

Indonesia: Tianjin Cement Industry Design & Research Institute orders two Loesche LM 53.3+3 CS mills for PT Semen Baturaja

Tianjin Cement Industry Design & Research Institute Co., Ltd. has placed an order for two type LM 53.3+3 CS Loesche mills for clinker grinding for PT Semen Baturaja. Each of the mills has a designed capacity of 175t/hr and material is ground to a fineness of 3400 Blaine. Each mill is fitted with a gearbox with a power of 4200kW. The lead time for the main components of the mill is nine months and the gearboxes are supplied within 12 months.

Top 100 cement companies ❁ Top cement-producing countries ❁ Map of global capacity ❁ Global per capita capacity trends

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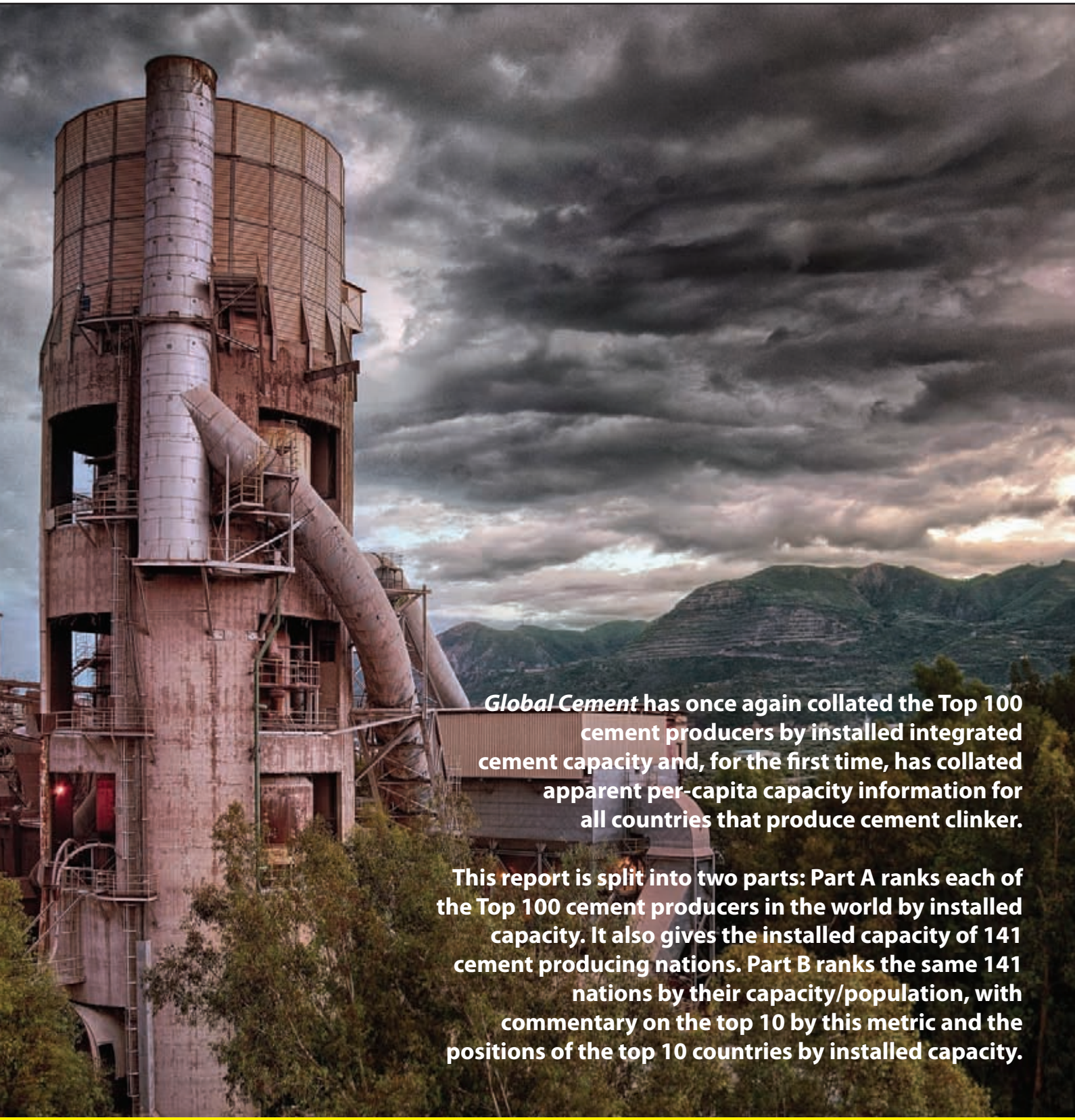

Global Cement **has once again collated the Top 100 cement producers by installed integrated cement capacity and, for the first time, has collated apparent per-capita capacity information for all countries that produce cement clinker.**

This report is split into two parts: Part A ranks each of the Top 100 cement producers in the world by installed capacity. It also gives the installed capacity of 141 cement producing nations. Part B ranks the same 141 nations by their capacity/population, with commentary on the top 10 by this metric and the positions of the top 10 countries by installed capacity.

www.globalcement.com/reports/top-100-report

Photo credit: Paul Touliatos, Titan Cement Drupano

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Cameroon: Mira to build 1Mt/yr plant

Mira plans to build a 1Mt/yr cement plant in Douala for an estimated cost of US$53m. The Swiss engineering firm has reportedly signed an agreement with the Government of Cameroon, according to sources at the Ministry of Industry, Mining and Technological Development. The plant will create about 1600 direct and indirect jobs.

Once built, the new plant will be the fifth in Cameroon. Existing cement plants operating in the country include LafargeHolcim's CIMENCAM, CIMAF, Dangote Cement and Eren Holdings' Medecem Cameroon. Total cement production in Cameroon is estimated at around 3.5Mt/yr and domestic demand is estimated at 5Mt/yr.

Iran: Iran starts deepwell cement plug production

Iran's Research Institute of Petroleum Industry (RIPI) has broken a US monopoly on the production of deepwell cement plugs.

Previously, only American companies manufactured the plugs used for solving deepwell problems like lost-circulation, sidetracking or directional drilling, according to RIPI. "The technology is of great significance in oil and gas drilling projects," said Talat Khalkhali, Director of the project to develop the technology at RIPI. The plugs are used to inject wellbore fluids and slurries during cementing operations in order to prevent them from mixing together. "Sidetracking incurs serious costs on cementing operations and the new plugs help reduce the cost to a considerable proportion," said Khalkhali, who added that properly placing the cement plug helps reduce non-productive rig time, minimises wasted material and mitigates the need for additional cementing services.

National Iranian South Oil Company tasked RIPI with carrying out studies for developing and formulating the plugs in 2010. RIPI reverse-engineered cement plugs produced in the US. The high pressure, high temperature (HPHT) plugs can be used for wells up to 4500m deep. According to Khalkhali, their American rivals can only be used for up to 2500m deep wells. The Iranian plugs have been tested several times at numerous wells across the country at various depths and have proven successful.

Africa: Limak Cement plans US$1bn African acquisition

Turkey's Limak Cement is in talks on the acquisition of cement operations in Africa, which could be worth up to US$1bn.

Limak, which already has interests in Mozambique and Ivory Coast, has signed a confidentiality agreement regarding the purchase from an international cement company, though the outcome of the talks will not be known for several months. Limak Cement Group's General Coordinator, Gultekin Aksuyek, did not say which company Limak was looking to buy the assets from, but said that it had operations in more than one African country.

"A global cement firm is considering selling its facilities in three African countries. We are seriously interested and have signed a confidentiality agreement," said Aksuyek. "I think we will know in five to six months." He said that Turkish companies have ground to make up in the continent, which has good growth opportunities.

Other overseas expansion plans are also in the works. "We are also studying a possible acquisition in one of the Latin American countries," said Aksuyek. "We may make an acquisition there in the next five years." Limak has 10 cement plants in Turkey and is building cement grinding and packaging facilities in Mozambique and Ivory Coast, which are expected to come online in 2016 and 2017. Limak Cement's sales volume is expected to grow by around 4% year-on-year in 2016 to 8.8Mt.

Saudi Arabia: Estanda completes cement ball mill commissioning

Estanda has successfully completed the commissioning of a cement ball mill for a cement plant in Saudi Arabia. The project was carried out on cement mill line 2, which operates in parallel with cement mill line 1, which had already been renovated and updated by Estanda in 2013.

The renovation of the cement mill affected all interior steel components of the mill involved in the grinding process; inlet headwall liners, lifting liners of the first ball mill chamber, the intermediate diaphragm, the second chamber classifying liners and the outlet diaphragm. The designs and materials were according to Estanda technical specifications. An improvement in productivity of more than 15%, a reduction in wear on the steel components leading to less maintenance and greater profitability were achieved.

Turkey: Batisöke Söke Çimento orders entire line of vertical roller mills from Loesche

A new kiln line is being developed at the Batisöke Söke Çimento Sanayii TAS cement plant.

Batisöke Söke Çimento has ordered a type LM 56.4 Loesche mill with a capacity of 500t/hr at a fineness of 12% R at 90µm for grinding cement raw material. The gearbox of this mill has a power of 3400kW. Magnetic separators, metal detectors, refined parts for the mill fan and the engineering of the cyclone are also included in the scope of supply. The lead time for this vertical roller mill is 10 months. The new kiln line will be fitted with a type LM 28.3 D Loesche coal mill with a capacity of 40t/hr at a fineness of 5% R at 90µm for grinding solid fuels. The gearbox has a power of 700kW. For this mill, the further scope of supply includes magnetic separators, metal detectors, process filters, refined parts for the mill fan and explosion flaps. For grinding clinker, a type LM 53.3+3 CS Loesche mill with a capacity of 200t/hr CEM I with a fineness of 3500 Blaine will be used. The gearbox has a power of 4700kW.

The commissioning of the new mills is planned in the second quarter of 2017.

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News in brief

Saudi Arabia: Qassim Cement's profit grew by 4% in 2015

Qassim Cement's net profit during the fourth quarter of 2015 grew by 4.69% year-on-year to US$37.4m. For the entirety of 2015, its net profit grew by 4.05% to US$156m, its gross profit grew by 2.33% to US$168m and its operating profit grew by 4.49% to US$160m.

Kenya: India's UltraTech may buy stake in ARM Cement

UltraTech Cement may buy a controlling stake in Kenya's ARM Cement. ARM announced on 23 December 2015 that it was in talks with an unidentified institutional investor about a US$125m investment.

Democratic Republic of Congo: Lafarge to increase exports

Lafarge Zambia and Zambia Railways Ltd (ZRL) have collaborated to increase cement exports to the Democratic Republic of Congo (DRC). A policy directive is being followed by the government to increase exports and help stabilise the local currency. Lafarge will start to export 400t/week of cement to the DRC in 2016 and will multiply its exports to Malawi by a factor of four.

Nigeria: Dangote donates 150 trucks to distributors

Dangote Cement has provided more than 150 new trucks to ease the distribution and availability of cement across Nigeria. The trucks are at no cost to distributors, although the distributors must reach a certain volume of sales within three years.

Egypt: Arabian Cement expects 2015 sales to hit US$294m

Arabian Cement Company expects its 2015 sales to reach US$294m, according to CEO Jose Maria Magrina. It has also finished converting its cement plant to use coal.

Kenya: Pokot Cement plant moves closer to construction

The contractor for the US$117m, 1.2Mt/yr Pokot Cement plant has finally begun to ship in materials for the project. The project was commissioned by the then-Prime Minister Raila Odinga in 2010.

Zimbabwe: Sino Zimbabwe to launch 42.5 OPC

Sino Zimbabwe Cement Company will launch 42.5 grade Ordinary Portland cement (OPC) for the construction of tall structures, bridges and roads in the first quarter of 2016.

The cement company, a joint venture between the Industrial Development Corporation and China Building Materials Corporation (CBMC), already offers 22.5 grade masonry cement, which is recommended for masonry work, brick, mortar, plastering and general building and 32.5 grade Portland composite cement, which is used for the construction of high strength structures.

Wang Yong, Managing Director of Sino Zimbabwe Cement Company, said that the company was now awaiting certification from the Standards Association of Zimbabwe (SAZ) before they could make the product available on the market. "We have already applied for the licence for us to introduce 42.5 grade cement on the market and I believe it will be issued after SAZ, which has already collected some samples, has certified the product," said Yong.

Malawi: LafargeHolcim and CDC Group to scale-up an affordable low-carbon construction solution

LafargeHolcim and CDC Group, the UK's development finance institution, have signed a Memorandum of Understanding to set up a company to produce an affordable low-carbon construction solution, earth-cement bricks, for developing countries. The technology was launched by LafargeHolcim in Malawi in 2013.

The manufacture of burnt bricks, the main building material in Malawi, is a significant contributor to the country's greenhouse gas emissions as a result of the wood-fired clamp kilns used in the production process. LafargeHolcim has developed an alternative solution to burnt bricks. Durabric is produced from a mixture of earth and cement compressed in a mould and left naturally to cure in the sun without firing. Durabric contributes to a reduction in greenhouse gas emissions and the deforestation associated with wood fuel consumption. The bricks are also more resistant than fired bricks and reduce construction costs.

More than three million of these bricks have already been produced in Malawi and have been used in around 500 buildings. A brick production plant is being built to increase the availability of Durabric in Malawi.

Ghana: Chinese cement imports cost Ghana industry US$13m according to CMAG

Ghana has lost over US$13m due to imports of around 500,000t of bagged cement, according to the Cement Manufacturers Association of Ghana (CMAG).

The association is fighting imports of bagged cement into the country, principally from China, because local cement production exceeds demand. Local cement production capacity is 7.4Mt/yr, current consumption is 5Mt/yr and this leaves a surplus of 2.4Mt/yr.

"It's mind-boggling to see the ascendancy of imports of bagged cement from China despite persistent petitions that the manufacturers have installed capacities to meet local demand," said the CMAG Chairman, George Dawson-Ahmoah. The association has been lobbying government bodies in Ghana since April 2015 on the issue of imported bagged cement from China. Local producers affected by the imports include Ghacem, Diamond Cement Ghana, Savanna Diamond Cement and Western Diamond Cement.

Here ***Global Cement Magazine*** presents its monthly review of global cement prices, in US$ for easy comparison. Much more price information (including the latest information on prices and market trends throughout the global cement industry from our price correspondents) is only available to subscribers of ***Global Cement Magazine***.

To get additional prices, you should subscribe - **See page 64**. In this issue subscribers receive information more information from India as well as Argentina, Nepal, Honduras, Sri Lanka, Thailand and others.

India: Average cement prices across India declined sharply by 7.3% in December 2015 compared to December 2014, mainly due to weak demand. All India average cement prices currently hover at around US$4.21-4.28/bag (50kg) compared to an average price of US$4.55/bag in December 2014, according to a report by Reliance Securities.

Northern and western regions have witnessed the largest declines, of 10-12%. However, Eastern and Central regions altered less dramatically year-on-year, by 6-10%.

Prices remained resilient in the southern markets despite poor construction activities, with the exceptions of Andhra Pradesh and Telangan. The region witnessed marginal 1.4% increase in prices from US$5.10/bag in December 2014 to US$5.18/bag in December 2015.

Prices in the western region were down by 7% month-on-month due to low activity and producers pushing out existing stock.

The demand environment continued to remain dismal, mainly on account of low private investment, labour and water issues in many areas, negligible pickup in real estate activities and delays to regulatory clearances across the country, according to Reliance Securities' Research Analyst Binod Modi.

Cement prices are expected to recover from January 2016 onwards as many dealers believe that prices have bottomed out. Demand is expected to pick up in 2016 and 2017, according to Modi.

Meanwhile, the Union Ministry of Road Transport and Highways (MoRTH) has started price negotiations with cement companies for supply to concrete road projects through INAM-Pro, a web-based portal for infrastructure and materials providers.

"The new price will be for a period of three years starting 1 April, 2016," said Sanjay Saju, Director of National Highways & Infrastructure Development Corporation Ltd, which runs the portal. "Negotiations were held with over 25 cement companies that will supply specific quantities of cement at an agreed price for customers ordering through the portal." There are 500 buyers registered with INAM-Pro.

The price of cement ordered through the portal ranges between US$2.43-3.09/bag (50kg ex-factory), far below the market price.

Egypt: Prices of Portland cement as at 21 January 2016. Arabian Cement = US$68.73/t; Building Materials Industries Co = US$65.16/t; ASEC Cement = US$65.54/t; Lafarge Cement Egypt = US$69.37/t; Sinai White Cement = US$65.16/t; National Cement = US$64.26/t; Portland Torah Cement = US$66.44/t; Helwan Cement = US$66.44/t; Misr Beni Suef = US$67.46/t; Swedi Cement = US$69.37/t; South Valley Cement = US$65.16/t; Arish Cement = US$65.54/t; Misr Cement Qena = US$65.44.

White cement prices as at 21 January 2016. Sinai White Cement = US$155.87-160.98/t; El Menya Cement - Royal = US$151.78/t; Menya Helwan Cement = US$152.03/t.

Blended cement prices as at 21 January 2016. National Cement Altawfir cement = US$59.41/t; Helwan Awaha cement = US$61.07/t.

Sulphate-resistant cement prices as at 21 January 2016. Cemex Almukawem cement = US$73.21/t; ASEC Cement Asic Sea Water cement = US$70.27/t; Lafarge Kaher Albehar cement = US$74.10/t; Suez Cement Alsuez Sea Water cement = US$70.27/t.

Prices are for cement in metric tonnes, unless stated otherwise. Where a source has given a range, the published price is the minimum value.

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CIF {+ the named port of destination} = Cost, Insurance and Freight: The cargo insurance and delivery of goods to the named port of destination (discharge) at the seller's expense. Buyer is responsible for the import customs clearance and other costs and risks.

ASWP = Any safe world port.

Conversions to US$ from local currencies are as at the time of original publication.

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When does courtesy turn into casual sexism?

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

I was at an industry dinner the other day and was chatting to a senior figure who happens to be male. He happened to mention something that happened to him recently that might have lessons for us all. He said to one of his female colleagues, in a meeting with a number of other colleagues, that he considered that she was wearing a pretty skirt, in words close to 'That's a pretty skirt you're wearing.'

He thought nothing more about it until about a week later, when the head of Human Resources (whom he happened to be senior to in the company in question) called him in for a one-on-one meeting. "You can't say that," she said to him, "it's inappropriate and sexist." He argued that he was just paying a compliment and that he should not be upbraided for commenting on someone's personal appearance in a positive manner. The CEO, who outranked them both, was called in to adjudicate, and left him in no uncertainty. It was wrong for him to make the comment, particularly to a member of staff who was junior to him.

He was outraged at this turn of events, and was sounding off to me at the unfairness of the thing. "I mean," he said, "if I had complimented a man on his tie, or on his shoes or the cut of his suit, I think that no one would have said a thing. In fact, next time, I might compliment all the gentlemen on something, and leave out the woman, and see if she likes that. Or compliment them, but ask her if she's put on weight."

Obviously, this is *not* the right thing to do.

Giving someone a compliment is a kind, positive thing to do, and it could help the atmosphere in the office, or meetings, or it might diffuse previous tensions. However, usually in any work relationship, one or the other is in a more senior position, so it might be difficult to avoid any accusation of either using your position to curry favour with a senior colleague or to exert some sort of power over a more junior one.

A good recent example was on LinkedIn, when a junior female lawyer requested a link with a very senior lawyer from another company. He accepted, but in his reply, he complimented her on her 'stunning' profile picture. She took umbrage at this un-requested comment, and went public with her annoyance, accusing him of sexism. Unfortunately, it did not work out well for anyone involved. The senior male lawyer was forced to make a grovelling apology, with his reputation in tatters. She was accused of committing 'career suicide,' with other companies telling her that she would not be in line to receive legal work from them.[1] As I always like to remind myself, as Confucius said, 'When setting out on a road of revenge, first dig two graves.'

Another example of a compliment going awry, was when President Barack Obama called California Attorney General Kamala Harris "the best-looking attorney general." The people in the room at the time seemed to recognise this immediately as an inappropriate thing to say, and the POTUS was forced onto the back foot, forced to defend his remarks. Which begs the question, when can you make a comment?[2]

One of the most active discussion threads that we have had on the Global Cement LinkedIn site was that on the problems of encouraging more women into the industry. None of them mentioned casual sexism from co-workers as a complaint - perhaps seeing any such ribaldry as part of the rough and tumble of any dynamic workplace. It's recognising when joshing steps over into bullying that is the tough part. Opening a door for someone? That's courtesy. Hanging around in order to open the door for someone? That's more like being creepy.

This kind of thing does happen - and according to some reports - such as the Everyday Sexism Project[3] - it happens a lot. People just don't think about the impact of their words or actions on others (an old Sioux saying suggests that 'Of the axe and the tree, it is the tree that does not forget'). As galling as it might sound, perhaps it is time for us all to consider some kind of training to be able to identify when behaviours are acceptable to new norms of political correctness - and when they are not. Obviously what passes for PC varies from country to country - for example from the USA to Saudi Arabia, from Germany to Italy.

Perhaps the best thing to do is just to say nothing at all to anyone at any time about their physical appearance or clothing. Then nothing can be misconstrued. It's a shame though, since the world will be a duller, greyer less amenable place without the sincere courtesies of old-fashioned mannerliness.

1 http://www.theguardian.com/technology/2015/sep/10/law-firm-partner-says-no-more-briefs-for-linkedin-sexism-row-barrister

2 https://www.washingtonpost.com/blogs/compost/wp/2013/04/04/after-president-obama-calls-kamala-harris-the-best-looking-attorney-general-when-can-you-compliment-a-womans-looks/

3 http://everydaysexism.com/

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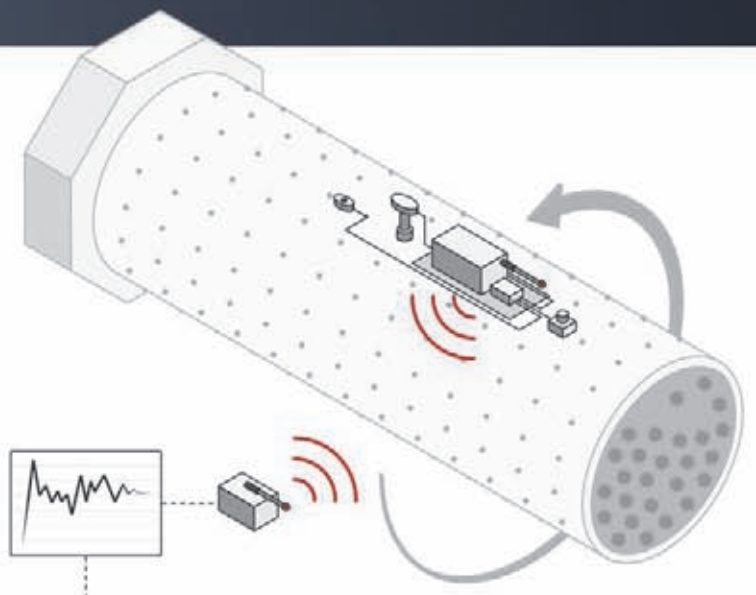

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