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JULY-AUGUST 2015

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This issue's front cover...

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global cement MAGAZINE

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Dear readers,

Welcome to the July-August 2015 issue of *Global Cement Magazine* - the world's most widely-read cement magazine. In this issue we bring news of several new projects and expansions across the world, some in unusual locations. One plant will come to Honduras courtesy of Italy's Goldlake Group, with construction due to start in July 2015. Over in Kyrgyzstan, China's Quilianshan Cement will build a plant at Osh. In Ethiopia, Nigeria's Dangote Cement started production from its new facility in May 2015. Brazil's Votorantim will expand its Turkish presence and there is also news of a 'mystery' new grinding plant for Kenya. A common theme with all of these plants is the often large distance between the country where the plant will be and where the plant owner is based. This is a sign that, amid all the distractions of the LafargeHolcim merger, the total number of multinational cement players continues to rise, not fall.

Of course, this issue also features the latest news on the LafargeHolcim merger. This includes the news that CRH, in addition to acquiring Euro6.7bn of Lafarge and Holcim assets, is also toying with major acquisitions in India and South Korea. The LafargeHolcim merger is also the subject of the article that kicks off this issue, taken from the *Global Cement LafargeHolcim Merger Report*. Turn to Page 8 to read how the merger of these two cement industry giants will affect the global cement picture,

Our technical articles in this issue include a number of alternative fuels features: A look at the possibilities of using oil refinery wastes as alternative fuels for the cement sector (Page 22); Improving the efficiency of solid alternative fuel production (Page 14) and; A summary of alternative fuel use by the cement producers of Hungary, Serbia and Slovenia (Page 18). We also have an account of a packing control system retrofit in Brazil by local firm Automaton (Page 12). Elsewhere, our comprehensive country reviews in this issue are of cement industries at completely opposite ends of the scale, namely Afghanistan and China. While China is the world's biggest cement producer and user (See Page 46), most of Afghanistan's cement plant projects have never made the transition from concept to reality, in a country that has suffered near constant political and military disruption in recent decades (See Page 54). We reviewed the country's only operational cement plant in the June 2015 issue of *Global Cement Magazine*, but this plant might not be alone for long. Several Canadian businessmen have stated their intention to invest in a new cement plant in Samangan Province, yet another example of long-distance foreign investment in the cement sector.

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

Dr Peter Edwards
Editor

abc Cement Industry Suppliers' Forum

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European cement

Cement in the Americas

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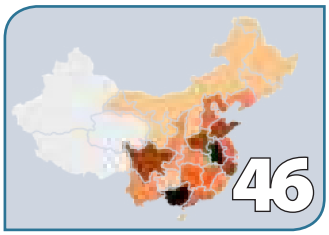

Middle East and African cement

Regulars and comment

13th TÇMB International Technical Seminar & Exhibition
7-10 October 2015, Antalya, Turkey
www.tcma.org.tr/ENG/index.php

15th Global Gypsum Conference & Exhibition
26-27 October 2015, New Orleans, USA
www.GlobalGypsum.com

20th Arab-International Cement Conference & Exhibition
10-12 November 2015, Cairo, Egypt
www.aucbm.org

11th Global Slag Conference & Exhibition
17-18 November 2015, Bangkok, Thailand
www.GlobalSlag.com

2nd Global Boards Conference & Exhibition on cement-bonded boards
January 2016, London, UK
www.GlobalBoards.com

10th Global CemFuels Conference & Exhibition
22-23 February 2016, Prague, Czech Republic
www.CemFuels.com

1st Global CemCoal Conference & Exhibition
March 2016, London, UK
www.CemCoal.com

3rd Global EnviroCem Conference & Exhibition
May 2016, London, UK
www.Environmental-Technology.com

1st Global CemProcess Conference & Exhibition
June 2016, London, UK
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17-18 November 2015, Le Méridien Plaza Athénée, Bangkok, Thailand

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Peter Edwards, Global Cement Magazine

The Lafarge Holcim merger: Report summary

The LafargeHolcim merger will be the largest combination of companies ever seen in the global cement industry. As such, it will dramatically alter the landscape of the sector in many countries, although there are also plenty of jurisdictions in which the sector will see little or no net change. Here, Peter Edwards summarises the key events in the making of the deal, the key market changes around the world and how LafargeHolcim will be positioned post-merger. All information is taken from the detailed 52-page *Global Cement Lafarge-Holcim Merger Report*, which is available separately (See Page 10).

A brief history of the LafargeHolcim deal

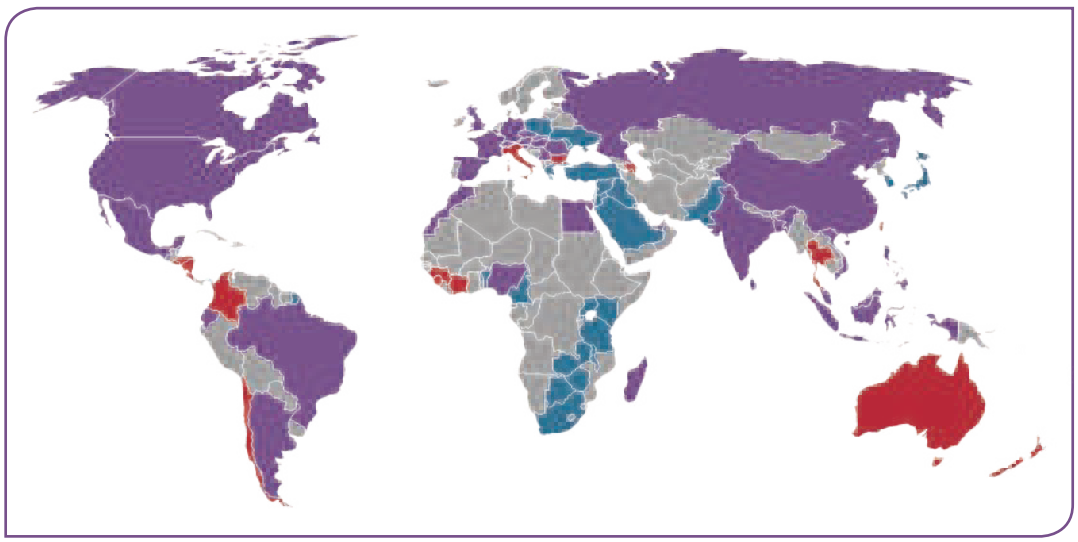
The LafargeHolcim merger was first announced on 7 April 2014 as a 'merger of equals,' with a proposed share ratio of 1:1 and a completion date of June 2015. Approval of the deal would require 66% support or greater from the shareholders of both Lafarge and Holcim. From the outset it was clear that divestments would be necessary in a number of markets to stave off uncompetitive situations. The markets in which Lafarge and Holcim made cement in 2014 are shown in Figure 1, which also shows the markets where their influences overlap. (Note that this is ***not*** a map of LafargeHolcim's assets).

By July 2014 Lafarge and Holcim set up a joint Divestment Committee, which proposed a series of divestments in Austria, France, Germany, Hungary, Romania, Serbia, the UK, Canada, Mauritius, the Philippines and Brazil. In the majority of the above countries, it was proposed that either Lafarge or Holcim assets be sold.

In the second and third quarters of 2014, Lafarge and Holcim sought and obtained approval for the merger in a number of key markets, including the EU. During the summer of 2014 a number of 'pre-emptive' deals also were conducted. These saw Lafarge sell its assets in Ecuador and consolidate its position in Africa by merging its Nigerian and South African arms into 'Lafarge Africa.' Holcim took over control of Bamburi Cement in Kenya from Lafarge and Lafarge sold its assets in Pakistan and Mexico. Approval from Brazil, India, the USA and Canada were granted in 2015, subject to the sale of various assets.

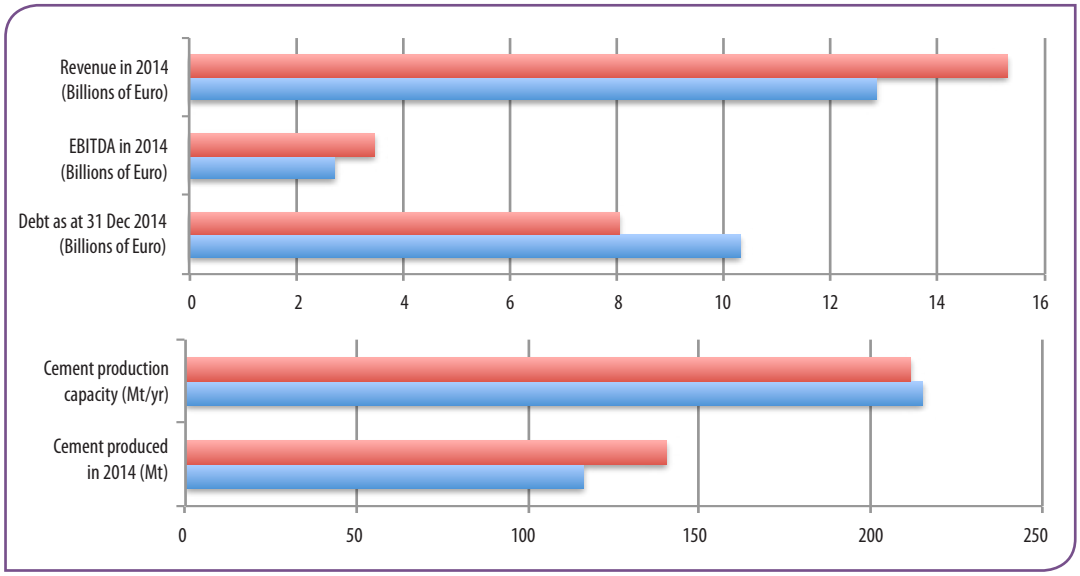
As well as news of the approval processes around the world, the third and fourth quarters of 2014 were awash with rumours regarding those candidates most likely to acquire the LafargeHolcim divestments. Prominent players from India (Aditya Birla Group), Brazil (Votorantim), Ireland (CRH), Turkey (Oyak Group) and Nigeria (Dangote Cement) threw their hats into the ring. Lafarge and Holcim received dozens of non-binding acquisition proposals.

Indeed, 2015 started fairly well for the proposed merger, with Ireland's Cement Roadstone Holdings (CRH) selected as the purchaser of Euro6.5bn-worth of Lafarge and Holcim's divestments at the start of February 2015. This includes 24 cement plants with a combined 25Mt/yr of capacity, as well as numerous ready-mixed concrete, aggregate and asphalt assets.



Right - Figure 1: Countries in which Lafarge, Holcim or both had cement interests as of 31 December 2014.

Source: 2014 Lafarge and Holcim Annual Reports.



Left - Figure 2: Summary financial and cement production data for Lafarge and Holcim in 2014.

Lafarge

Holcim

Source: 2014 Lafarge and Holcim Annual Reports.

14 of the 24 cement plants are in Europe. CRH is also linked with a separate deal to acquire selected assets of Lafarge India, which are not part of the larger deal.

Later in the spring of 2015, however, Lafarge and Holcim published their 2014 Annual Reports. These showed significant divergence between the two companies' financial performances, a trend that had been observed (but broadly dismissed as transitory) in the latter stages of 2014. Holcim had out-performed Lafarge drastically, as shown in Figure 2.

In the face of escalating divergence, however, the shareholders of Holcim - including vastly influential 20.1% owner Thomas Schmidtheiny - stated that they could not accept the 1:1 merger as originally proposed. During March 2015 there were separate and joint discussions before it was agreed that the ratio should be 10 Lafarge shares to every nine Holcim shares. This gives Holcim shareholders 55% of LafargeHolcim and Lafarge shareholders 45%.

In an associated disagreement, it was also decided that Lafarge CEO Bruno Lafont, who Holcim shareholders saw as responsible for Lafarge's poorer performance, should not take the position of CEO of LafargeHolcim. This has since been filled by Eric Olsen, another Lafarge employee.

In April 2015 CRH was approved as the purchaser of the Euro6.5bn-worth of assets in the EU and on 27 May 2015, Lafarge and Holcim entered a binding agreement with CRH regarding the sale. On 1 June 2015 Holcim launched a public exchange offer for all Lafarge shares at an exchange ratio of nine Holcim shares for 10 Lafarge shares.

LafargeHolcim's global position

At the time of the announcement of their planned merger Lafarge and Holcim were the two largest multinational cement producers. Lafarge was the largest, with 215Mt/yr of cement capacity and Holcim was the second-largest cement producer with 211Mt/yr.

When it is formed, LafargeHolcim will be by far the largest cement producer, around 2.5 times larger than the next-largest multinational Heidelberg Cement and larger than all of China's domestic giants. The group will have in the order of 340Mt/yr of cement production capacity in 62 countries. The capacity it holds represents around 18% of global cement capacity outside of China.

The LafargeHolcim position will be unchanged relative to the prior Lafarge or Holcim positions in 44 countries by dint of there being only Lafarge or Holcim assets in those countries prior to the completion of the merger. LafargeHolcim will have to sell selected assets in 10 countries in which both Lafarge and Holcim had previously operated. Many of these are in Europe, where Lafarge and Holcim are historically based.

LafargeHolcim will take on the full assets of Lafarge *and* Holcim in eight countries, mainly very large markets in which neither Lafarge nor Holcim has historically been a major force. It will have entirely departed from three further markets that previously had Lafarge or Holcim capacity.

Europe will be home to 18 of LafargeHolcim's 62 domestic markets, where it will have 59.2Mt/yr of cement capacity. It will be present in three countries in North America (36.2Mt/yr), eight in South America (20.8Mt/yr), 21 in Africa and the Middle East (64.4Mt/yr) and 12 in Asia (169.8Mt/yr).

North America is where LafargeHolcim will wield the most power relative to its competitors, with the largest shares of the US and Canadian markets and the second-largest stake in Mexico after Cemex. South East Asia is another fairly powerful region for the new player, although it does not have many assets in Indochina or northern Asia.

Northern parts of the Middle East are strongholds for the new venture. This is mainly thanks to former Lafarge assets but it will be less well represented on the Arabian Peninsula.

LAFARGE + Holcim

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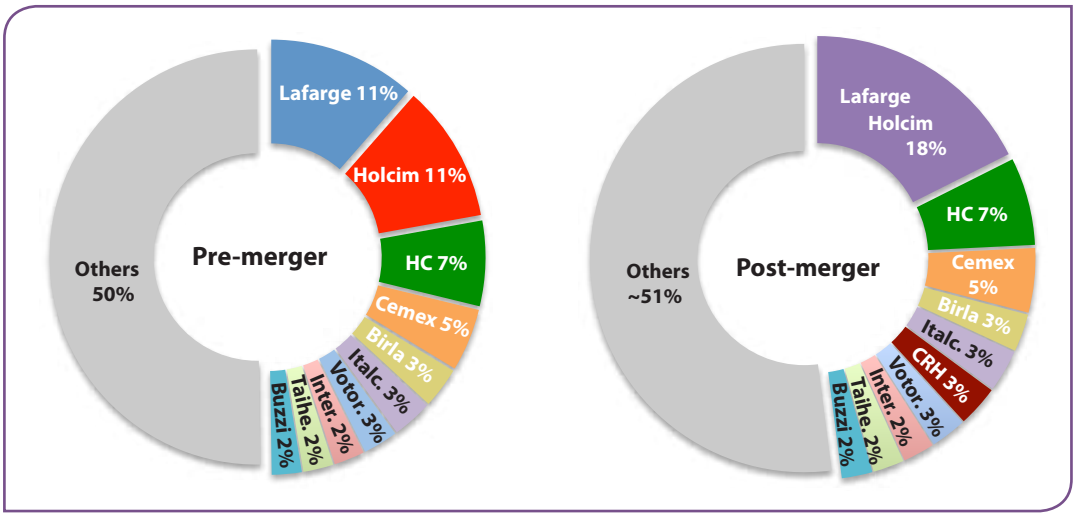

Left - Figure 3: Approximate proportions of global cement production capacity (integrated and grinding) held by multinational cement producers before (left) and after (right) the completion of the LafargeHolcim merger.

HC = HeidelbergCement.
Italc. = Italcementi.
Votor. = Votorantim.
Inter. = Intercement.
Taihe. = Taiheyo.
Buzzi = Buzzi Unicem.

In Europe, LafargeHolcim's assets will be spread evenly due to the high level of overlap between Lafarge and Holcim assets prior to the merger, which has led to many divestments.

As a whole, the African market is best described as 'patchy,' although this is the case for all other producers too. It has a focus in western and southern Africa, as well as in selected northern markets like Egypt and Morocco.

For its part, South America is the continent with the least LafargeHolcim influence. While it has a dominant position in a few small markets it is up against the dominant regional power Cemex in many Spanish-speaking nations, as well as Cementos Argos in Colombia. LafargeHolcim will only have a small stake in the continent's largest market Brazil, which is dominated by domestic producers InterCement and Votorantim.

The rest of the global cement industry

The merging of Lafarge and Holcim to form LafargeHolcim fundamentally changes the dynamics of the international cement market. It will be transformed from having two large main players to just one. The list of the top cement producers will be shuffled around. HeidelbergCement rises from third to second (128Mt/yr, 7%), Cemex rises from fourth to third (94Mt/yr, 5%). Birla Group and Italcementi also rise.

CRH (55.4Mt/yr, 3%) will come from 'nowhere' straight into sixth position. It will have acquired around 25.4Mt/yr of capacity from Lafarge and Holcim, with an existing ~30Mt/yr of cement capacity across its operations in Europe, North America, India and China.

Conclusions

Different national markets and companies will be affected to differing extents by the creation of LafargeHolcim. Despite this, however, many markets will remain unchanged and divestments have only been required in 10 out of 62 countries. A further three markets will have been left (or already have been left) by LafargeHolcim.

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Giancarlo Borges Avelar, Automaton Integração de Sistemas, Brazil

Cement packing machine re-vamp: A case study

A Brazilian cement plant recently underwent a filling and bagging control system upgrade by Automaton Integração de Sistemas, also based in Brazil. Here the project coordinator Giancarlo Borges Avelar describes the reasons behind the upgrade, the work conducted and how the plant has benefitted from the installation.

There are now about 90 cement plants in Brazil, which are operated by 15 cement companies. The plants are responsible for distributing cement in a country with a land area in the order of 8 million km^2. The distribution radius of a particular plant can vary from 300km in the south and southeast regions up to 1000km when it comes to the northern-most region of the country.

According to the Sindicato Nacional da Indústria do Cimento (SNIC), about 20% of Brazilian cement is distributed to concrete producers via bulk trucks and around 80% goes to distributors and end consumers in bags. Around 95% of the cement produced is distributed by road.

The importance of the bagged sector in Brazil

In a country where 80% of cement consumption is in the form of bags, plants with modern bagging and shipping systems that are easy to maintain and less susceptible to faults will be a step ahead of competitors. An outage due to old or inefficient packing systems will not only damage sales and affect delivery commitments, but may also cause damage to a company's image.

Half of the existing cement factories in Brazil today started operation before 2000 and broadly maintain the same functional and operating characteristics from that time. It is not rare to find that these older units use discontinued process controllers and programming software that is obsolete or no longer supported. This can make it very difficult to check and solve a problem. For example, a production stop that might normally require just a few minutes to be resolved can sometimes go on for hours due to the obsolescence of the control system.

Modernisation of a control system

In late 2014 Automaton, a Brazilian company that specialises in systems integration, modernised a cement extraction line and associated four-line bagging system at a Brazilian cement plant. The control system comprised electrical panels (See Figure 1) and operating stations that had been installed in the 1990s. The main problems to be solved were:

- Components discontinued: Difficult and expensive to acquire;
- Obsolete programming software: Used MS-DOS operating system;

Right - Figure 1: The old programmable logic controller and its electric panel.

Right - Figure 2: The new programmable logic controller and its electric panel.

Left - Figure 3: A view of the packing line shortly after start-up.

- Obsolete computers without spare parts and obsolete software (Windows NT).

The modernisation of a control system is a complex and time-consuming task, where planning and experience of retrofit projects is essential. In the case described here, the following steps were necessary in order to perform the modernisation:

- Evaluation of the existing facility;
- Hardware specification and necessary software;
- Development of new control software;
- System halt for hardware change;
- Verification and start-up of new system.

It is very important to correctly assess the necessary changes to the existing facility as this can greatly reduce the amount of downtime required.

As the electrical signals of the four packing lines were not separate in the panels, it was necessary to shut down all of the packers at the same time in order to do the job. Each signal from the old hardware control was disconnected and reconnected to the new hardware (See Figure 2).

The sequence of the electrical connections was maintained and the new equipment was identified exactly as the previous equipment. This meant that it was not necessary to make any revision in the electrical drawings. The new control software that had previously been developed was downloaded and testing / verification of the connections was performed.

The work was completed over two days working 24 hous per day. Shortly after start-up the four bagging lines were already operating at their rated capacity (See Figure 3).

In one of the bagging lines the control system for a bag applicator was also revamped. The downtime for the modernisation of this applicator was 24 hours, during which obsolete hardware was exchanged for new components and mechanical adjustments and alignments were made to the machine (See Figure 4).

Conclusions

The advantages of the new system are:

- A modern control and computer hardware with spare parts and lower maintenance costs;
- Reduction of downtime expected due to precise diagnostics and easy problem identification;
- Easier to implement expansions and improvements thanks to the new, user-friendly control software.

In both the bag system software and the bag automatic applicator system, features were developed that did not exist in the previous set-up. These improvements have more flexibility in identifying defects as well as in equipment tests and adjustments that are made periodically for maintenance.

Left - Figure 4: A bag applicator was also upgraded.

Peter Streinik, UNTHA shredding technology

Analysing the energy efficiency of SRF production

The manufacturing of solid recovered fuel (SRF) in a single pass is not a new concept. However, with the environmental efficacy of alternative fuel production under increasing scrutiny, a one-step process is of growing importance. Here Peter Streinik, Head of Business Unit Waste at UNTHA shredding technology, explains why.

There can be no disputing that alternative fuel production is becoming increasingly acknowledged as a valuable part of the global resource agenda. While it has long been a staple energy source in parts of continental Europe, its value is now being embraced in other parts of the world too.

In developing countries in parts of Asia for example, where waste streams are less refined and waste management infrastructures not as established, the role of solid recovered fuel (SRF) is coming to the fore. Solutions are even being developed for materials like mixed textile and rubber footwear products, which would be considered a challenge to process in many more developed markets.

It seems a number of cement producers are taking proactive steps to improve the waste-to-energy landscape too. In south east Asia, for instance, UNTHA has seen a growing number of cement kilns shortening the supply chain by opening their own waste plants. By closing the loop, they are ensuring the security of their input energy materials, safeguarding the specification to which their SRF is produced, and making productive use of resources that may otherwise be dismissed simply as 'rubbish.'

Whilst SRF specifications are defined in every instance, the globalisation of alternative fuel production does seem to present differing terminologies and opinions as to what constitutes SRF. A 50mm particle size can suffice for some calciners, for example, with others stipulating 30mm. Elsewhere, some main burners require 30mm in three dimensions, which could mean an output size as low as 15mm. It all depends on the technology being used. However, with calorific values typically rising as the output size requirement is lowered, the cost of production will also increase.

Production efficiency is key

One thing that remains an increasingly common priority worldwide, however, is the need to produce alternative fuels in the most efficient way possible, without compromising on fuel quality or the safety of operatives. Inevitably, as the global spotlight shines more brightly on SRF, the environmental efficacy of its production seemingly attracts greater scrutiny.

This is perhaps unsurprising. SRF production and usage must reap commercial advantages of course. But to truly commit to and improve our worldwide sustainability agenda, those involved in the market should also consider the energy efficiency of waste to energy technologies, not just outputs and the bottom line.

If electricity consumption during the production process is excessive for instance, the parasitic load of

Right: An UNTHA SRF production system featuring the XR Cutter.

Above: Reducing the number of processing steps in SRF production can result in massive energy and cost savings for processors and cement plants alike.

waste to energy plants has to be questioned. On the other hand, by designing processes and commissioning technologies that lessen electricity consumption, SRF manufacturers can maximise the net environmental gain of their operations. And organisations with a watchful eye on costs will reap the financial benefits that come with energy savings too.

Increasing SRF production efficiency

There are a number of ways to achieve greater energy efficiency within an SRF production plant, and feed-in arrangements seem the obvious starting point. If pre-sorted input materials can be fed into an SRF shredder using just one wheeled loader rather than two pieces of plant such as a grab and shovel, this reduces the amount of diesel – not to mention labour – required to power the kit.

This benefit is magnified if SRF can be manufactured in a single step shredding process, as the cost to procure and run one machine is naturally less than it is to operate both a pre- and post-shredder. It is not uncommon for a dual-stage diesel-fuelled SRF production process to run at Euro35-48/t in operating costs alone, for instance.

However, replace with electrically-powered shredding technology, or better still a single electric-drive machine that can produce SRF without the need for two shredders, then such energy consumption and associated costs are soon eroded.

Water-cooled synchronous motors play a significant role here. In UNTHA's new waste shredder for example, it has implemented an Eco Drive concept that has taken four years to engineer, develop, trial and roll out. This enables the motors to work continually without overheating. The machine can achieve the same tonnage as traditional static shredders, but with 50% less power consumption. When compared with mobile diesel shredders, the power savings can attain 220%. This enhances the environmental efficacy of the operation and could equate to electricity savings in excess of Euro700,000 over the lifetime of the machine.

In terms of the wider plant, by taking advantage of ever-more sophisticated sorting technologies, it is possible to produce a high quality, well-defined fuel using pieces of equipment. Yes, in some instances a simple conveyor, over band magnet and wind shifter may be required, in addition to the shredder and in-feed/out-feed kit. However, with experience and innovation, increasingly refined plant designs are possible. Gone are the days of multiple machines and auxiliary equipment and with them otherwise avoidable energy consumption.

This goes to show that the drive to adopt a more environmentally-sound approach to SRF production should not restrict producers with unnecessary 'red tape', nor should it erode their margins. On the contrary, more energy-efficient considerations should reduce unnecessary financial spend, not to mention the impact on the environment.

It could also be argued that thinking about SRF production from this perspective will 'future-proof' operators from potential industry developments beyond their control. It must be acknowledged for example that, in reality, the alternative fuels market is in its infancy at present. As it grows and matures, the regulations that govern it will undoubtedly evolve too. So, as with any business environment, the waste to energy sector will require increasingly sophisticated methodologies if operators are to thrive commercially, while remaining compliant.

Being more environmentally responsible now will perhaps help to ensure greater compliance when waste to energy production protocols inevitably become more stringent.

Global Cement staff

Loesche Seminar 2015 - Reviewed

The Loesche Seminar 2015 *'Step by step towards alternative fuels'* took place on 6-8 May 2015 in Vienna. The event comprised presentations and two site visits: One to the Rohožník cement plant in Slovakia and one to the Wietersdorf cement plant in Carinthia, Austria. The event, jointly organised by Loesche GmbH and A TEC Production and Services GmbH attracted 80 attendees from 20 countries.

1: Matthias Mersmann presented twice. He gave delegates an introductory talk and also explained process optimisation for the cement industry by aixergee GmbH.

2: Delegates visited the Rohožník cement plant just over the border from Vienna in Slovakia. The plant is a leader in alternative fuels use, with a thermal substitution rate of higher than 80%.

3: Silos for the bypass dust, the source material for the ReduDust system at the Rohožník cement plant.

4: The waste heat recovery (WHR) system at Rohožník has been in place since 2014.

The future of the alternative fuel sector, development in the cement and lime industry as regards solid alternative fuels, and solutions to challenges arising from operation with a high proportion of alternative fuels in the combustion process, were all presented at the Loesche Seminar 2015. In addition, experiences gained in the preparation of alternative fuels in a new chain beater mill, the Rocket Mill from A TEC, were addressed.

After a Vienna city welcome tour and Danube dinner on 6 May 2015, the seminar programme commenced on 7 May 2015 after an introduction by Dr Thomas Loesche, with a presentation *'Step by step towards alternative fuels'* by Matthias Mersmann.

The second presentation, by A TEC's Dr Stefan Kern, tackled the present trend towards ever stricter emissions regulations, which can pose great challenges to plant operators, especially when firing alternative fuels. Kern addressed the new strict 200mg/Nm^3 emissions limits for German cement plants coming in 2018. He explained not only the mechanisms of NO_x formation during combustion in cement plants but also NO_x decomposition mechanisms. This served as a basis to explain the correct design of staged combustion in a calciner, as an effective measure to reduce the NO_x emissions to a low level without employing either ammonia or urea. Should the NO_x value subsequently be above the limit, then an SNCR system can be employed.

The 'ReduDust' concept was presented by Dr Ernst-Michael Sipple from Holcim Eastern Europe and Johannes Müller from A TEC. This involves complete recycling of the bypass dust via the ReduDust process. Initial operational experiences in the Holcim cement plant in Rohožník, Slovakia, have demonstrated that around 4000t of salable salts can be produced from 20,000t of bypass dust every year. The chloride salts that cling to the bypass dust are dissolved in a salt solution and separated from the purified bypass dust (Cl^- free) by means of a filter. After purifying the salt solution, these can be crystallised into KCl and NaCl separately.

A very recent A TEC project featuring the increased use of alternative fuel was presented by Harald Durstberger, also of A TEC. His paper *'Calciner modification including a new hot gas chamber at Buzzi Cement Hranice'* demonstrated the reconstruction of the cement plant in Hranice, Czech Republic, where A TEC, in cooperation with Czech partner Aliacem, designed and built a calciner. A TEC was responsible for the engineering and supply of the components, while Aliacem was responsible for steel construction, refractory lining and construction work on site. The benefit here is that the design of the combustion chamber functions without hot meal, thus allowing alternative fuels of very low quality and very low calorific value to be employed.

After a networking coffee break, the programme continued with a further presentation by Matthias Mersmann. He explained process optimisations for the cement industry by aixergee GmbH. Mersmann explained aixergee's modus operandi, illustrating every aspect of the pyro-process through CFD mod-

5 + 6: The Rohožník cement plant has a ReduDust bypass, which removes salable salts from the bypass dust. The cement mills all have third generation separators and one is equipped with an ARGO press.

7: In discussion during a coffee break. From left to right: Dr Thomas Loesche (Loesche), Johannes Müllner (A TEC) and Hans-Joachim Grieb (A TEC).

elling. He rounded off his presentation by looking at selected optimisation case-studies.

Georg Lechner from Scheuch then explained the latest trends in filter technology. The focus was on Scheuch's new technology for combined denitrification 'De-NOX' and for the removal of CO. This 'DeCONOX' system is currently installed in the Kirchdorf cement plant in Austria. The different process variants of SCR denitrification systems were also explained.

Dr Hansjörg Diller from MVW Lechtenberg und Partner then imparted his knowledge in his presentation *'What will be the future of alternative fuels?'* about the current and future trend of using alternative fuels globally. He focused especially on Egypt and Europe.

In the afternoon a number of participants travelled by coach to the Rohožník cement plant in Slovakia. The ReduDust concept, which makes it possible to efficiently recycle 20,000t/yr of bypass dust, was presented in depth during the plant tour.

In the evening, the guests looked back at the day at a convivial dinner on Kahlenberg hill with a splendid view from 484m above Vienna.

Second day

Michael Suppaner from A TEC started off the second day with his presentation *'Ultimate cement kiln process technology,'* which gave participants an overview of pyro-process design requirements. He also presented the A TEC Post Combustion Chamber (PCC), which is reported to positively benefit reduction of CO and NO_x emissions and through which alternative fuels and petroleum coke performance increases.

In the next presentation, A TEC's Johannes Uttinger detailed the experience gained by the company using the new chain-beater mill - Rocket Mill - which was first presented at the Loesche Symposium in 2014. The many reported advantages of this mill compared with conventional shredders and cutting mills can, in principle, be summarised as follows: Crushing is possible in one step from <300mm to <15mm, appropriate for main burner fuel. At the same time as being crushed, the material is dried and inorganic components - ash - are separated. With the crushing technology, a product with a particularly high specific surface area is reportedly generated, giving a very positive effect on ignitability and burnout.

It was also reported that the mill had achieved considerable operational cost reductions after just a few weeks in operation and that the substitution rate of alternative fuels was significantly increased owing to enhanced fuel quality.

The new burner from A TEC Greco, the Flexiflame EcoPro, which was designed with up to 100% solid alternative fuels utilisation in mind, was presented by Martin Willitsch of A TEC GrecoCombustion Systems Europe. The presentation also offered insight into the main burner combustion phases and processes.

The seminar's final presentation entitled *'Mercury emission reduction in cement kilns'* featuring the new 'ExMercury' system for mercury emissions reduction was presented by Friedrich Willitsch of A TEC. This system was jointly developed by A TEC, Scheuch and the W&P Wietersdorf cement plant. In this system the mercury cycle in the raw meal / filter dust is broken by treatment of the filter dust. This dust is heated, which causes the mercury to vaporise. The dust can be reused in the system. The mercury vapours are adsorbed by activated carbon. The low energy and low activated carbon requirements are reportedly a special feature of the system.

This presentation set the tone for the plant visit which directly followed. Participants travelled by coach to the Wietersdorfer & Peggauer GmbH cement plant in Carinthia. After a hearty lunch on-site, not only were the operational experiences with the chain-beater mill - Rocket Mill - and the Flexiflame EcoPro burner presented, but also the 'ExMercury' system was shown in operation. Participants had the opportunity to pose detailed questions directly to the cement plant operators and were reportedly impressed by the positive operating results.

8: A presentation about the Flexiflame EcoPro Burner was delivered by Martin Willitsch of A TEC Greco.

9-11: Delegates tour the Wietersdorfer cement plant in Carinthia, where they viewed the operation of its Rocket Mill, Flexiflame EcoPro Burner and ExMercury system.

Amy Saunders & Peter Edwards, Global Cement Magazine

Global CemFuels focus: Central Europe - Part 2

Central European countries like Hungary, Serbia and Slovenia have made great strides in the use of alternative fuels in the past 20 years, with some plants entering the hard-to-reach >80% bracket. However, while there is often technical excellence, many plants are suffering from irregular supplies and the influence of the voracious waste-to-energy sector.

Hungary

Cement production

Hungary has six cement plants that are run by four cement companies and have a combined production capacity of 5.27Mt/yr (See Figure 1). The latest consumption volumes from the Hungarian Cement Association (MSCZ) show that domestic cement consumption peaked in 2006 at around 4.3Mt and has since fallen steadily, reaching approximately 2.5Mt in 2010. According to CEMBUREAU, the Hungarian construction market grew by 9.6% year-on-year in 2013 following several years of decline.

Alternative fuels background

The MSCZ reports that environmental concerns are a prominent priority among Hungarian cement producers. In 2000, Hungary's average alternative fuel substitution rate was 0.6%. This grew to 3% by 2006. Hungary's use of cement additives such as flue-gas desulphurisation (FGD) gypsum, blast furnace slags, fly ash and pozzolana was 20% in 2006.

Alternative fuels used by cement producers

NOSTRA Cement: NOSTRA Cement (70% Lafarge / 30% Strabag), which operates Hungary's most modern cement plant in Baranya, has 0.85Mt/yr of cement production capacity. Although it doesn't currently use alternative fuels for cement production, it started working with the WWF to locate sources of biomass waste for use as alternative fuels in 2013. The waste was to be non-indigenous invasive plants.

Duna-Dráva Cement (HeidelbergCement): Duna-Dráva Cement operates two cement plants in Hungary with a combined production capacity of 2.8Mt/yr, making it Hungary's largest cement producer by installed capacity. The 1.4Mt/yr capacity Vác plant in Pest was modernised by Éltex in 2012 to increase its alternative fuel use and a 30,000t capacity waste processing plant was installed on-site. The alternative fuel substitution rate was 30% in 2012.

The 1.4Mt/yr capacity Beremendi cement plant in Baranya uses biomass and waste tyres, among others, as alternative fuels for the production of cement. The plant underwent an extensive upgrade in 2009 in order to increase its alternative fuel substitution rate, which is now at over 80%.

Outlook

The IMF has forecast that Hungary's GDP will grow by 1.7% in 2015 due to rising domestic demand and an improved labour market. Hungary's government is expected to increase its public sector spending as the economy strengthens.

However, Hungary is likely to continue to be a difficult market for cement producers for some time, with rising fuel prices and an energy sector that relies heavily on imports. Alternative fuels and cement producers may both find Hungary a challenging but rewarding market in which to operate.

Below: The skyline of Budapest, capital of Hungary. The imposing Hungarian Parliament Building can be seen in the far left, with the Széchenyi Chain Bridge in the foreground.

Serbia

Cement production

Serbia's cement industry consists of three integrated cement plants with a combined production capacity of 3.45Mt/yr that are operated by three producers. The industry was state-run until 2002 and is still undergoing development.

Cement consumption patterns in Serbia are typical of transitional economies, according to the Association of the Cement Industry of Serbia (CIS). Sales of bagged cement dominate over bulk cement due to the large number of individual construction sites and the low number of government-funded projects from years of economic constraints.

Alternative fuels background

As for much of Europe, waste is a major concern of the Serbian government. The country's current waste management schemes are in need of urgent updating

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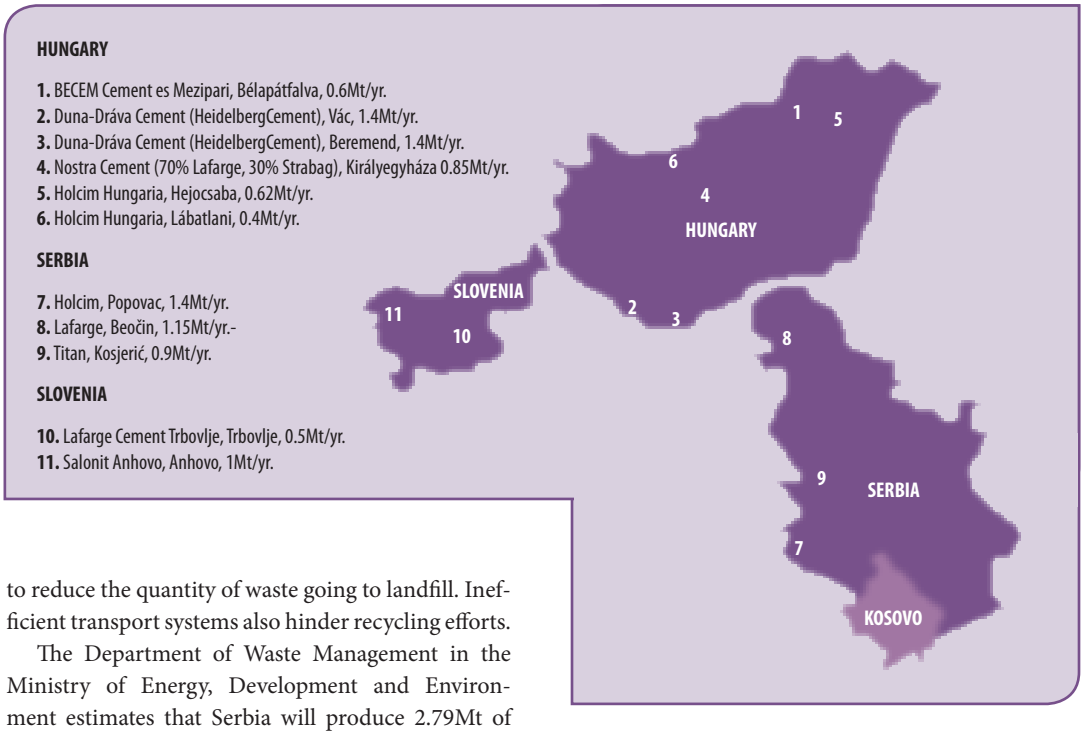

Left- Figure 1: Map of Hungary, Serbia and Slovenia, showing location of integrated cement plants. **Source:** *Global Cement Directory 2015.*

to reduce the quantity of waste going to landfill. Inefficient transport systems also hinder recycling efforts.

The Department of Waste Management in the Ministry of Energy, Development and Environment estimates that Serbia will produce 2.79Mt of solid municipal waste in 2014 and 3.27Mt by 2019. Quantities of household waste are projected to reach 2.37Mt in 2014. This includes 1.75Mt of biodegradable municipal waste, 30,000t of waste tyres, 160,000t of sewage sludge and 296,000t of animal waste. Accordingly, the Department plans to harmonise the country's waste collection system with the establishment of 12 regional control systems and to increase waste collection to cover more than 75% of Serbia's waste. In particular, it plans to set up a system for the collection of hazardous, pharmaceutical and animal wastes.

The Department of Waste Management also intends to encourage the use of waste as an alternative fuel for cement and power plants with Euro958m of investments between 2010 and 2019. As well as improving waste management systems, the funds will be used to provide loans to industrial plants, to enable the ability to use waste as alternative fuels. Ultimately, Serbia aims to reduce the amount of waste that it sends to landfill by 95%.

Alternative fuels used by cement producers

Lafarge: Lafarge's 1.15Mt/yr Beočin cement plant in South Bačka has used waste tyres since 2008, waste oil from 2010 and biomass from 2010. In March 2011 Lafarge invested Euro2m to establish a solid and municipal waste processing plant, the products of which are used as an alternative fuel for cement production.

The wastes consist of 'pre-selected and hard chopped municipal and industrial waste.' The plant was the first of its kind in Serbia and can produce 24,000t/yr of alternative fuel. In Serbia alternative fuels now comprise around 25% of Lafarge's fuel mix. The alternative fuels cost around Euro1.3/GJ, a third of that of coal, providing both economic and environmental benefits. Lafarge is also persuing further modernisations and has applied for a Euro58m loan from the EBRD in order to increase its alternative fuel substitution rate to 50%.

Left: The cement plant in Beočin was nationalised by the Serbian government in 2002. It was bought by Lafarge.

Holcim: Holcim's 1.4Mt/yr capacity Popovac cement plant is also a significant user of alternative fuels. The plant is partnered with Ecorec. In 2011 the Popovac plant used 121Mt of coal, 5.87Mt of petcoke, 439,721t of natural gas, 173,753t of diesel, 147,940t of waste tyres and 632,949t of solid recovered fuel (SRF) as fuel for cement production.

Titan: Titan's 0.9Mt/yr capacity Kosjerić cement plant does not currently utilise alternative fuels. In 2013 the plant used 72% petcoke, 12% lignite, 11% coal, 4% fuel oil and 1% diesel. In the future it aims to use SRF comprising non-hazardous industrial and municipal waste.

In 2013 the Kosjerić plant was granted approval from the Ministry of Energy, Development and Environmental Protection for a study to assess the

Right: View over Lake Bled, northern Slovenia.

environmental impact of the use of secondary recovered SRF. The project will use a 26% substitution rate and ultimately plans for the consumption to 25,000t/yr of SRF.

Outlook

Serbia's ongoing economic development and rapidly-expanding industrial sectors will lead to both short- and medium-term growth within the construction industry. GDP is expected to grow by 1.5% in 2015. A Euro400m investment for the rehabilitation of roads across most of Serbia was announced in July 2014. Works are expected to continue for two to three years. The government has also embarked upon a plan to construct more affordable housing, while a new thermal power plant is set to be built in Kostolac, Braničevo District, in line with the country's growing energy consumption.

The growing number of new construction projects is likely to increase domestic cement demand. Consistent with ongoing trends, bulk cement demand is likely to grow at a faster rate than bagged cement on the back of increased government investments.

Given Serbia's expected acceptance into the EU, which strongly promotes circular economies, as well as the Serbian government's preference for environmentally-friendly policies, the consumption of renewable and alternative fuels is likely to grow at a faster rate than fossil fuels. The country may soon bring significant opportunities for producers of high-quality alternative fuels and suppliers to the sector.

Slovenia

Slovenia's cement industry consists of two cement plants. The 0.5Mt/yr capacity Trbovlje cement plant is owned by Lafarge Slovenia, while the 1Mt/yr capacity Anhovo cement plant in Kana lob Soči is run by Salonit Anhovo. The two producers are represented by the Slovenian Cement Producers Association (SLOCEM), which was founded in 2003.

According to Cembureau, Slovenian construction activity fell by 2.9% year-on-year in 2013, a slower rate than in recent years. This was contributed to by a 27% fall in residential construction, an 18.9% reduction in non-residential construction and 5.7% growth in the civil engineering market. Cement production grew to 1Mt in 2012, up from 620,000t in 2011, according to the USGS.

SLOCEM statistics show that domestic cement consumption/capita rose gradually in the 2000s, peaking in 2007 at 799kg/capita, and has since fallen to 444kg/capita in 2011, the latest year for which data is available.

Cement producers

Lafarge Slovenia: Lafarge Slovenia's plant in Trbovlje has used alternative fuels since 2009, although the plant was stopped from producing cement in March 2015 due to not having the appropriate environmental permit.

The country's environment inspectorate acted following a decision from the European Commission to refer Slovenia to the European Court of Justice for failing to issue an industrial permit. The Commission is also asking for fines to be imposed.

Lafarge respected the decision and closed the plant on 5 March 2015. It has since lodged a state-complaint with the Ministry of Environment and Spatial Planning. Lafarge said that in the process of obtaining the required licences, it had operated in accordance with all relevant environmental standards and that numerous studies have shown that the plant does not have a major impact on local air quality. It also stressed that it had invested more than Euro33m to modernise the plant since it was bought by Lafarge some 14 years ago.

Salonit Anhovo: Salonit Anhovo runs the largest cement plant in Slovenia with a cement production capacity of 1Mt/yr. It uses waste tyres, waste oils, MBM, sludge, SRF and hazardous waste as alternative fuels. Its total alternative fuel substitution rate is 70%, of which 40% is hazardous waste. Petcoke and coal make up the remaining 30% of required fuels.

Outlook

The IMF has predicted that Slovenia's GDP will grow by 0.9% in 2015. Accordingly, Cembureau expects the civil engineering industry to grow due to the completion of ecological and urban infrastructure projects. However, the residential and non-residential construction sectors are expected to stagnate or decline, despite the increase in issued building permits in 2013.

Im 2014 Petra Kajic from Lafarge Slovenia noted that the country's waste sector is not well-organised. To increase the alternative fuel substitution rate of Slovenian cement producers, more infrastructure and management is required. Kajic estimates that the waste processing market for cement production is around 250,000t/yr.

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Ted T Reese, Cadence Environmental Energy

Identifying alternative fuels opportunities in the petroleum refining industry

The global demand for alternative fuels continues to increase and diversify. Cement companies are under increased scrutiny to deliver high quality products in a safe environment, while continuing to increase their efficiencies. The need to reduce kiln operating fuel costs therefore remain one of the largest goals for cement producers. Traditionally this has involved solid wastes, particularly from municipal sources. Here, however, Ted T Reese of Cadence Environmental Energy highlights the potential to use wastes from the oil refining industry as alternative fuels for cement production.

Significant increases among a variety of alternative fuels have been achieved in many major markets including Europe, the Americas, Asia, and many other regions by a wide range of cement companies. Municipal waste and biomass materials continue to be at the forefront of many of these new developments. Cement manufacturers are specifically focused on these materials due to their large supply and potential for reducing fossil fuel use. There are, of course, many factors associated with taking these wastes and turning them into usable high-quality fuels, including numerous hurdles.

The solid shredded alternative fuel market garners most of the attention from waste generators and cement plants, as well as various vendors in the business of preparing, delivering and conveying alternative fuels. However, as the need for reducing fuel costs remains high, demand will not be met solely with these types of solid materials. It is, therefore, imperative to continue to search for additional wastes that can be used as alternative fuels. The petrochemical and refining industry is one source that has been underdeveloped and could offer high-quality alternative fuels in many markets.

Increased refinery investment and capacity

Saudi Aramco will invest US$90bn between 2012 and 2017 to increase its refining capacity by 50% up to 6 million barrels per day (mbpd). Most of this increase is being developed in Asia, primarily in China.[1] The UAE has also announced it will increase its refining capacity to 1.1mbpd by 2017 from 707,000bpd at present.[2] Meanwhile, Motiva, a joint venture between Saudi Aramco and Shell Oil, invested US$10bn to create the largest refinery operations in the United States. The refinery is located in Port Arthur, Texas and has a capacity of 600,000bpd. With all of these investments (and others) being made, refining capacities will continue to increase, as will the amount of waste they produce. Some of the wastes will be potential alternative fuels for the cement industry.

The refining process

Refining is the process of manufacturing petroleum products and other usable products from crude oil. There are many variations and types of crude oils from around the world. Selection is critical and influences the potential products and the cost of making them.

The first stage of crude processing is distillation, in which the crude oil is separated into varying components based on their boiling points. There are many processes used, including hydroprocessing, reforming and catalytic cracking. As well as producing many final products within the refinery, all of these processes remove impurities from the crude oil. In addition to the many processes there are also large quantities and volumes of stored hydrocarbons. The refineries, unlike the petrochemical and chemical industries, generate a small percentage of waste in comparison to volumes of products made. However, significant opportunities do exist for alternative fuels based on the very large crude oil volumes processed.

Identifying alternative fuel opportunities

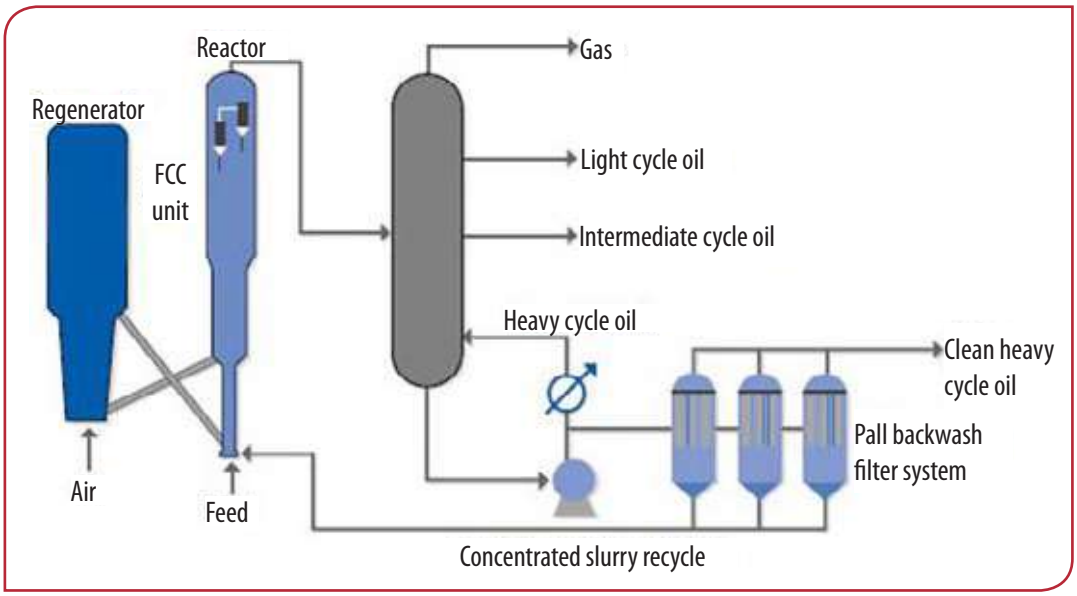
As Cadence enters its 40th year in business, primarily as a North American fuel supplier, many lessons have been learned by developing successful alternative fuel programs. Three keys to a successful alternative fuel programme are:

1. Identifying a qualified and successful fuel supplier;

2. Identifying and securing a long term fuel supply;

3. Building a lasting relationship between the kiln, the fuel supplier and the fuel source.

Cadence is also entering its 30th year as the exclusive hazardous waste fuel supplier to Ash Grove Cement in the United States. Over 150,000t of liquid waste derived fuels (LWDF) are provided annually



Left - Figure 1: Production of FCC slurry oil. **Source:** Precision Filtration Products.

and used as alternative fuels at both of Ash Grove's fully permitted Resource Conservation and Recovery Act (RCRA) Part B Facilities. LWDF heat content ranges between 19-28MJ/kg. In addition to the liquid supply, Cadence has also supplied a variety of solid wastes (primarily hazardous materials) focusing on high revenue and high heat content fuels. These solids have been fed to the kilns from containers, sacks or in bulk. The combination of high revenue (disposal fees) in addition to high heat content materials is critical in selecting long term supply sources. Solid heat content ranges from 10-17.5 MJ/kg.

Using these historical fuel values as a basis for cement kiln alternative fuels, multiple opportunities have been identified in the refining process.

Fluid catalytic cracking slurry oils

Above - Figure 2: Appearance of FCC slurry oils.

The most profitable process in the refinery is the fluid catalytic cracking (FCC) unit where gas oils are 'cracked' to produce valuable gasoline and distillate fuels. Catalysts are used in this process and often carry over, which contaminates the slurry oil. Some slurry oils are sold as feedstock to other industries. However, a significant volume of this material accumulates and is stored in large tanks.

As the oil has already been processed, it has less value in the refinery than unprocessed crude oils and is often viewed as a waste. However, this waste is a valuable alternative fuel to the cement kiln, as its heat content can be as high as 21.3MJ/kg.

The slurry oil is often transported in vacuum boxes as it contains both free liquids and solids, giving a sludgy consistency. In addition the material also contains elevated levels of alumina and silica. This comes from the catalysts used in the FCC units and can sometimes be of value to cement kilns in cases where additional aluminium and/or silicon content is required in the feed.

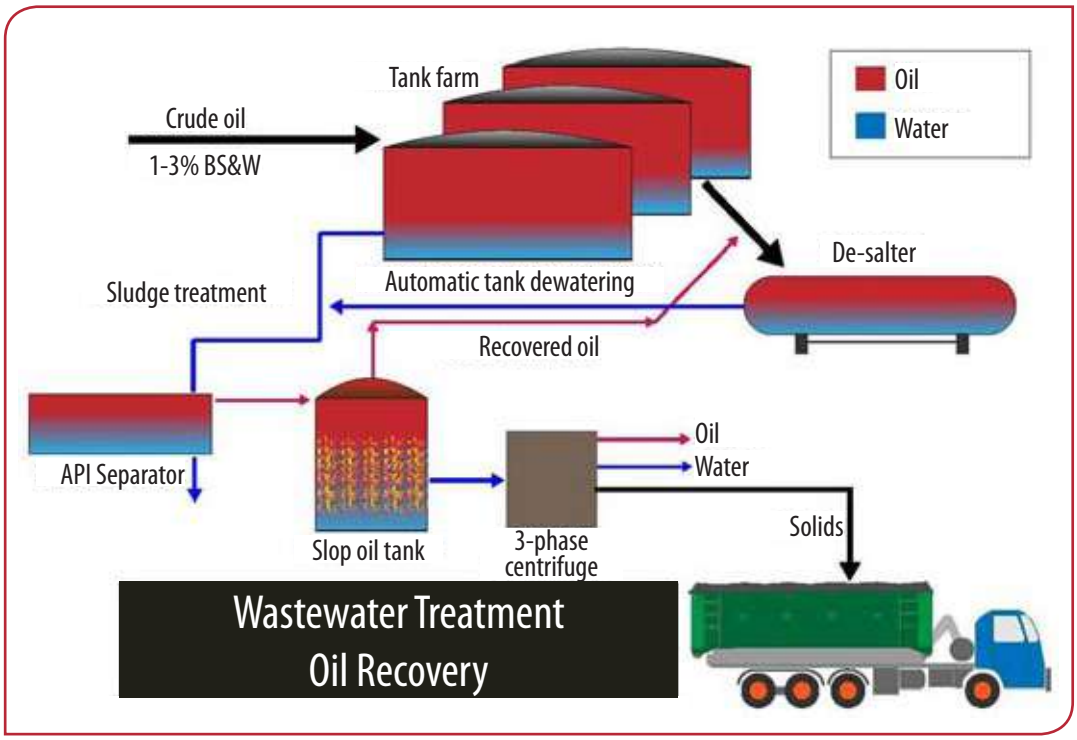
Left - Figure 3: Slurry oil tank.

Below left - Figure 4: Vacuum sludgebox.

Waste	FCC slurry oil
Physical characteristics	Pourable sludge / Oil with free liquids
MJ/kg	9.3 - 21.3
% Chlorine	0.1 - 0.8
% Water	0 - 13%
% Ash (Furnace)	30 - 55%
pH	5 - 8
Mercury (ppm)	0 - 1*
SiO_2	11 - 17%
Al_2O_3	14 - 24%
Fe_2O_3	0 - 6%

Left - Table 1: Physical and chemical characteristics of FFC slurry oil.

* Mercury is a naturally occurring element varying in the crude oil. Content can be less than 1ppm with high levels seen at 5-10ppm.



Right - Figure 5: Schematic of the WWT oil recovery process.

Wastewater treatment (WWT) – Oil recovery

Crude oil contains contaminants known as basic sediment and water (BS&W). These exist in an emulsion form and generally account for 1-3% of the crude oil content. BS&W is removed from the crude oil prior to refinery processing. The material is sent to the wastewater treatment (WWT) area where the refiner's primary goal is to recover the valuable unprocessed oil. Three phase centrifuge operations are commonly used to separate the oil, water and solids. The refiner treats and releases the water, reprocesses the oil as a feed stock and disposes of the solids. Some refiners chose to send these solids (either in solid or emulsion form) internally to their coker unit as opposed to sending offsite for waste treatment. This is an option that is used but does have downside as it devalues the coke product. The centrifuged solid is the alternative fuel opportunity for the cement producer. These solids have heat content values between 8-16 MJ/kg and are often transported in roll-off boxes containing minimal or no free liquids.

Right - Table 6: Physical and chemical characteristics of WWT centrifuged solids.

* Mercury is a naturally occurring element varying in the crude oil. Content can be less than 1ppm with high levels seen at 5-10 ppm.

Waste	WWT Centrifuged solids
Description	Solid
MJ/kg	7.7-16.3
% Chlorine	0-2
% Water	20-50%
% Ash (Furnace)	20-35%
pH	7-9
Mercury (ppm)	0-7 *
SiO_2	2-19%
Al_2O_3	1-14%
Fe_2O_3	1-8%

Below - Figure 5: Centrifuged WWT solids.

Conclusion

The opportunity to use increasing and diversified volumes of alternative fuels in the cement industry remains high. The oil refining industry offers several opportunities for waste materials to be used as such. However, as with all alternative fuels, identifying these materials and developing a long-term supply programme is critical to the success of the programme for the cement producer.

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Moving the goalposts on a regular basis is not conducive to investment...

Koen Coppenholle Chief Executive of CEMBUREAU, the European Cement Association

During the course of June 2015, the European Commission adopted its *'Better Regulation Package,'* which, as the title suggests, aims to improve regulation at the EU level. Comprising a range of documents from communications and staff working documents to a 'toolbox,' the package brings forward some interesting ideas, one of which is improving the consultation process with a view to covering the entire life cycle of a proposal, from pre-proposal to legislation and, finally, evaluation.

Here, stakeholders will be consulted on roadmaps and impact assessments, as well as legislative proposals, delegated acts and, importantly, implementation. Stakeholders should hopefully also find it easier to track each legislative initiative through a dedicated website, which the Commission plans to create. The Better Regulation webpage will also allow citizens and interested parties to provide their feedback on and ways of improving EU law via a *'Lighten the Load – Have your say'* feature. In addition, each proposal will clearly indicate, through an explanatory memorandum, how the key principles of subsidiarity and proportionality have been applied.

In terms of the Impact Assessments, before a proposal can be adopted by the European Commission, it will need to be endorsed by the Impact Assessment Board (IAB), which will look at EU legislation and carry out fitness checks, i.e.: assess the cumulative burden of legislation on industry. The IAB will be composed of six full time members; three European Commission civil servants (without a post) and three individuals who are not civil servants, but who will be hired for a fixed term period. Amendments brought forward during legislative negotiations between the Parliament and the Council will also be subject to the principles of better regulation.

In this respect, the Commission will propose a review of the inter-institutional agreement on better law making. Finally, the Regulatory Fitness and Performance Programme (REFIT) will be strengthened in order to make it more targeted, quantitative and politically prioritised. Here, a REFIT stakeholder platform will be established, comprising high level experts from business and society, as well as Member State representatives, appointed in an open and transparent process. Stakeholders will be able to send their requests to the platform which will consider them before making suggestions to the Commission.

The package certainly sends some positive signals to those active in the 'Brussels bubble.' For the cement industry, less red tape would certainly be welcome. However, most importantly, we need legal certainty and predictability – moving the goalposts on a regular basis is not conducive to investment in Europe. Only time will tell as to whether this package really has the potential to improve the EU legislative maze.

In May 2015, the European Commission published a roadmap entitled *'Revision of the EU Emissions Trading System (ETS): post-2020 elements, including an adjusted linear reduction factor and provisions to address the risk of carbon leakage.'* The Roadmap further elaborates on and executes the Conclusions of the European Council (Heads of State and Government) of November 2014. The overall objective of this Roadmap is to achieve, in a cost-effective manner, the EU 2030 greenhouse gas emission reduction target of at least 40% compared to 1990. At the same time, the document focuses on three, more specific objectives, namely:

- To revise the EU Emissions Trading Directive (EU-ETD) in a way which ensures a 43% reduction of EU-ETS emissions by 2030, compared to 2005;
- To establish a post-2020 carbon leakage prevention architecture for industrial sectors;
- To further implement EU-ETS related aspects of the 2030 climate and energy policy framework.

The Roadmap outlines a series of options that have the potential of helping to achieve these objectives. These include increasing the linear reduction factor of 1.74% to 2.2% from 2021 onwards and extending support for innovation to 400 million allowances.

Regarding carbon leakage, the Roadmap recognises that there are many elements that need to be taken into account when determining future allocation, such as updating the benchmarks and ensuring that allocation is more closely aligned with actual production levels.

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Europe: LafargeHolcim job changes ahead of merger closure

As the merger completion date nears, Lafarge and Holcim have made significant personnel changes, which include the loss of 500 jobs.

LafargeHolcim will employ 115,000 people and will be balanced between a decentralised structure and strong central functions based on three organisational levels: Countries, regions (Europe, North America, Middle East & Africa, Latin America, Asia-Pacific) and corporate functions. There will be an equivalent number of personnel in the central functions in France and Switzerland. LafargeHolcim's research and development centre will be located in France. The reorganisation of central functions will result in 380 net job losses at Lafarge, with 166 in Paris and Lyon. There will be no job losses in Lafarge's operational functions in France. Holcim's reorganisation will result in 120 net job losses in Holcim group functions in Switzerland. The implementation of the new organisation is expected in early 2016 after the completion of all relevant social consultations in Switzerland and France.

The appointments for the future executive committee of LafargeHolcim have been completed following a recommendation by Eric Olsen, future CEO of the combined group. The executive committee will comprise:

- Finance - Holcim's Thomas Aebischer;
- Integration, organisation and human resources - Lafarge's Jean-Jacques Gauthier;
- Europe - Holcim's Roland Köhler;
- Asia Pacific - Holcim's Ian Thackwray;
- Middle-East Africa - Lafarge's Saâd Sebbar;
- North America - Holcim's Alain Bourguignon;
- Latin America - Lafarge's Pascal Casanova;
- Performance and cost - Holcim's Urs Bleisch;
- Growth and innovation - Lafarge's Gérard Kuperfarb.

Meanwhile, Lafarge's board of directors awarded chief executive Bruno Lafont a Euro2.5m bonus 'for his key role in the merger project with Holcim' and 'his exceptional performance.' The board accorded the bonus at a meeting on 12 May 2015 after Holcim shareholders approved the merger by a vote of 94%.

In other news, Lafarge and Holcim have now entered a binding agreement with CRH regarding the sale of several assets, subject to the completion of the merger. The assets include operations mainly in Europe, Canada, Brazil and the Philippines with an enterprise value of Euro6.5bn.

Most recently, following the clearance from the Autorité des Marchés Financiers on 28 May 2015, Holcim launched the public exchange offer for all Lafarge shares at an exchange ratio of 9 Holcim shares for 10 Lafarge shares on 1 June 2015. The public exchange offer will be open for 25 trading days until 3 July 2015. With this public exchange offer, Lafarge and Holcim are implementing the final step of their project to merge the two companies. The merger is expected to close in July 2015.

News in brief

Estonia: 30 job redundancies

HeidelbergCement's Estonian subsidiary Kunda Nordic Tsement has reduced its output and made 30 employees redundant, citing a decline in clinker exports to Russia.

Poland: Production up by 2.9%

Cement production increased by 2.9% year-on-year to 1.62Mt in May 2015, according to Poland's Cement Producer Association. In the 12 months that ended on 31 May 2015, cement production grew by 1.5% year-on-year to 5.64Mt.

Russia: Construction halts

Lafarge has suspended the construction of a Euro710m, 2Mt/yr capacity cement plant in Rostov. The plant was scheduled to launch in 2016.

Ukraine: Eurocement Ukraine cuts cement production 22%

Eurocement Ukraine cut its cement production by 21.9% year-on-year to 1.09Mt in 2014. Its sales volumes decreased by 24.7% year-on-year to 1.09Mt, while its sales fell by 19.5% to Euro34.1m. It reported a Euro11.7m loss in 2014, as its net revenues fell by 23.6% to Euro34.3m.

Turkey: Explosion kills three

An explosion and resulting fire at Bolu Cement in Kazan killed three employees on 24 May 2015. Two other workers were injured. Chief of production Haluk Bilge, deputy manager Orhan Özer and an operations staff member Bayram Altın died.

Spain: Cartel probe expanded

Spanish competition regulator CNMC has expanded its cartel probe into 14 cement and concrete producers. It carried out inspections at the producers' headquarters on 27 and 28 May 2015. It has 18 months to decide whether it will impose any fines.

Russia: Dako delivers 185t mill

Germany's Dako Worldwide Transport has transported a 185t cement mill over 5700km from the manufacturer's location in Austria to a cement plant in Sterlitamak, Russia.

Ireland: Quinn Cement fined for 2014 dust emissions

Quinn Cement has been fined Euro2000 plus costs after pleading guilty to failing to control dust emissions from its plant in Ballyconnell, County Cavan.

Reports of at least three houses and cars in the nearby area being coated in a film of cement dust were made to the Environmental Protection Agency (EPA) after a filter bag failed at the plant on 5–8 September 2014. An EPA inspector visited the area and took statements from complainants, including an asthmatic who had raised fears in relation to the health impact the dust might have.

At Cavan District Court on 21 May 2015, the court heard how the cement plant was shut down while the fault was found and rectified. A number of fail-safes have since been employed at the plant to safeguard against a re-occurrence. Judge McLoughlin convicted and fined Quinn Cement Euro2000 on one count of failure to control dust associated with activity, which resulted in an impairment of or an interference to amenities or the environment beyond the installation boundary, subject to licence. A second count was struck out on the agreement that the company also pay costs incurred by the EPA in carrying out its investigation of Euro5570.

Belgium: Cembureau welcomes new president

Daniel Gauthier, CEO of Western Europe-Africa and member of the managing board of HeidelbergCement, has been elected as president of Cembureau for a two-year term after having completed his mandate of vice president over the last two years. He takes over from Peter Hoddinott, executive vice president of performance and member of the executive committee at Lafarge. Gonçalo Salazar Leite, CEO of Secil, has been elected as vice president of Cembureau for two years.

UK: Hope invests Euro1.4m in cement rail transport

Hope Construction Materials has announced a major investment in rail transportation from its Hope cement plant in Hope, Derbyshire. Hope will invest Euro1.4m in the manufacture and long-term lease of 48 tailor-made rail wagons for cement distribution. The wagons are due for delivery in the autumn of 2015. They will improve Hope's ability to transport 1Mt of cement to depots, including Theale near Reading, Dewsbury near Leeds and Walsall, for onward road deliveries.

Andy Watson, deputy rail manager, Clive Roberts, national logistics manager and Frank Cooper, team leader, next to a tailor-made rail wagon.

Portugal: Cimpor reports fall in cement sales

In the first quarter of 2015, Cimpor's cement and clinker sales fell by 5.3% year-on-year to 6.8Mt. Growth in Argentina, Paraguay, Portugal and South Africa was not enough to offset a downturn in Brazil and Egypt. Sales rose by 7.4% year-on-year to Euro637m, bolstered by an overall rise in average prices. However, Cimpor's earnings before interest, taxes, depreciation and amortisation (EBITDA) of Euro123m reflected the lower activity in the first quarter.

In Brazil, Cimpor's cement sales were affected by the economic contraction. Local constraints on the water supply affected the construction market, which in turn hit cement demand and put pressure on energy costs. In Argentina, Cimpor outperformed growth in local consumption, which was robust. Cement consumption in Paraguay remained dynamic and Cimpor, which is now making use of all of its local production capacity, showed a marked improvement in its EBITDA margin.

In Portugal, after a long period of downturn in consumption, the market returned to growth in the first quarter of 2015. Cimpor said that it managed to capture the growth in domestic market demand while also maintaining its export capacity.

In South Africa, despite strong competition from a new operator in Cimpor's operating region and from imports, its commercial policy and the launch of co-processing made it possible to take advantage of growth in local demand. Cement demand in Egypt was expected to have fallen and was more pronounced in Cimpor's volumes because of an adjustment to its natural market share after posting an unusually high level of sales in 2014. This was based on competitors' operations being negatively affected by fuel scarcity.

Cimpor said that a new commercial dynamic introduced into its activities in Mozambique had come to fruition in the first quarter of 2015. Despite a negative market trend over the previous year due to adverse weather and problems with local power supply and increased pressure from importers, cement sales fell only by 1.5% year-on-year.

Turkey: Votorantim to expand

Votorantim Cimentos has announced a Euro140m investment in the expansion of its cement plant in Sivas, Turkey.

The investment will increase the plant's cement production capacity from 0.6Mt/yr to 1.8Mt/yr. It will allow Votorantim, which currently operates at full capacity in Turkey, to increase its market share. The Sivas plant currently accounts for about 19% of Votorantim's 3Mt/yr production capacity in Turkey. After the expansion, it will account for 42% of its Turkish production capacity.

"Votorantim sees the potential of Turkey's construction sector and this investment shows our commitment to reinforcing our presence in Turkey. Sivas' expansion will bring a crucial dynamism and competitiveness to the company in the Turkish cement market," said Mustafa Şefik Tüzün, CEO of Votorantim in Turkey. Construction, which began in June 2015 and will employ around 700 people, is expected to be complete in 2017.

Ukraine: Dyckerhoff reports 2014 net loss

Dyckerhoff Cement Ukraine's net loss reduced 7-fold to Euro8136 in 2014 and its revenue fell 6.6-fold to Euro398,695.

In 2015, Dyckerhoff Cement Ukraine plans to acquire the 2Mt/yr capacity Volyn Cement plant in Rivne and the 1.25Mt/yr capacity YUGcement plant in Mykolaiv. The plants are already part of Dyckerhoff and would be turned into separate divisions to increase sales in Ukraine.

Dyckerhoff Cement Ukraine's shareholders will also consider the early termination of the current supervisory board.

UK: Hope to surpass 50% alternative fuels consumption

Hope Construction Materials has collaborated with Saxlund International to install and commission a new waste-derived fuel solution for Hope's cement plant in Derbyshire, UK. The solution provides storage, transportation, weighing and injection of solid waste fuel to the two kilns. The goal is to increase Hope's alternative fuel substitution rate to more than 50%, a key part of its long-term sustainability targets.

The project incorporates a fuel reception and push-floor storage solution, reclaim conveyors, process tower with drum magnet and star screen, together with a weighing and pneumatic injection system to the main burners. The system facilitates stable and reliable process conditions to help minimise build-up in the pre-heater tower. It also offers a 'future-proof' solution with the flexibility to handle changing fuel characteristics and different types of waste-derived fuels, should suppliers change in the future.

"This is a flagship project for us. Once fully operational, the new solid waste fuel system will run on a 24/7 basis to deliver 5t/hr of fuel to each kiln," said Matt Drew, managing director of Saxlund International. "Hope will soon be operating with a significantly larger proportion of waste-derived fuels, in the process diverting up to 80,000t/yr of bulk solid waste from landfill and representing significant carbon savings."

UK: Mid UK Recycling plans SRF plant expansion

Mid UK Recycling Limited plans to extend its Wilsford Heath waste management facility at Ancaster, South Kesteven in Lincolnshire. If its plans are approved, the plant would recycle up to 350,000t/yr of waste mattresses and plastics, among others.

Chris Mountain, managing director, said that the investment could run into 'multiple millions' of Euros. "We will put in the main planning proposal in the next three months and as soon as we get the green light we'll start," said Mountain. The company wants to start by December 2015, although it may take three years to complete the expansion.

"The range of products we produce is getting wider and wider," said Mountain. There would be a building for machinery that could break down mattresses into resalable parts. Leftovers would form solid recovered fuel (SRF) products, which could be used by cement plants and power stations. Another building would be created for packing and storing gypsum from recycled wallboard, which would be sold to supermarkets as cat litter. The business would also bring in a new way to recycle rigid plastics, breaking them down into granules to sell to local manufacturers of drainage pipes, water pipes and car parts.

Waste is transported to Mid UK Recycling plants via a number of different lorry types.

Ireland: CRH's 2015 investment spend set to surpass Euro7bn

CRH's investment spend for 2015 looks set to exceed Euro7bn as the company has been linked with a move for South Korea's Tongyang Cement & Energy, which has a market value of nearly Euro600m. Its owner is reportedly putting a 74% stake on the market with a Euro800m price tag.

CRH's Euro6.5bn purchase of assets being sold as part of the LafargeHolcim merger is due to conclude in the summer of 2015. CRH management has said that it won't be the limit of its 2015 spending. Indeed, CRH chief executive Albert Manifold said that the group had a 'very strong' acquisition pipeline.

CRH has spent Euro45m in the first four months of 2015. Manifold said that it currently has a Euro1bn US deal under consideration and a Euro700m deal, which is speculated to be in Europe. Additionally, local media have reported that CRH is one of 16 likely bidders for Lafarge India assets in east India valued at Euro890m. The binding bids are due by 15 July 2015. Manifold noted that CRH typically concludes around 10% of the deals that come onto its radar. However, if all of those deals came to pass, CRH's 2015 investments would exceed Euro9bn.

If the Korean deal goes ahead, it would boost CRH's Asian presence, which is already being improved via new assets in the Philippines from the LafargeHolcim deal. CRH said that it would repackage its Asian operations into a separate grouped entity in 2015 to cater for its growing size.

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Ireland: The CCPC goes to court over Irish Cement

Ireland's competition watchdog will go to the High Court in July 2015 as part of its probe into alleged anti-competitive practices in the cement industry. The watchdog has launched an investigation into whether Irish Cement has abused its dominant position in the market, which the company denies.

In May 2015, the Competition and Consumer Protection Commission (CCPC) seized thousands of documents when it raided the offices of Irish Cement, a subsidiary of CRH. It also visited the offices of several other companies. The CCPC will ask the court in July 2015 to rule on which of the documents seized it is allowed to use for its case, as some of the material could constitute privileged information, such as legal advice.

Irish Cement has stated that it fully-facilitated the 'raid' on its premises and is cooperating fully with the CCPC investigation. The commission's investigation is focused on the Euro50m/yr bagged-cement sector. The investigation could take some time to complete before any further legal action, if any, is taken. The CCPC has stressed that the planned court hearing does not mean that it will prosecute. "The commission has not instituted High Court proceedings against Irish Cement for any breach of competition law," it said.

Czech Republic: Lafarge cement's sales up by 5%

A reviving building material market has raised Lafarge's sales in the Czech Republic by 5% year-on-year to US$35.2m in 2014. Profits from operations soared by 53% to US$6.55m. The growth was attributed to rising sales, an extraordinary revenue from the sale of carbon credits and operating savings. About 40% of its output was exported in 2014.

Czech cement consumption increased by more than 4% year-on-year to 3.5Mt in 2014 and the same growth rate is foreseen for 2015. Cement investments are estimated at US$1.09m for the year.

UK: Disused cement plant may become holiday resort

A disused cement plant in Shoreham, West Sussex may be transformed into a Euro143m eco-friendly resort. Plans for the 477,529m^2 site would see 600 eco-friendly holiday pods with glass roofs constructed. 1.5MW solar panels mean that the on-site vehicles will not consume any petrol.

The development has been drawn up by architects at ZEDfactory. "It's taken a colossal amount of work and will see a significant investment," said ZEDfactory director Bill Dunster. "It will be a very beautiful place. Instead of seeing vertical chalk cliffs, it will be entirely green, ivied, with trees." As well as an amphitheatre and 600 holiday homes, the quarry will house 50 'earth sheltered homes' built partially underground. The scheme has the backing of the Low Carbon Trust and the plans will be lodged later in 2015.

ZEDFactory's designs for the eco-friendly holiday homes. **Photo:** http://www.SWNS.com.

Russia: Eurocement plans

Eurocement Group has forecast that Russian cement consumption may fall by 5-10% in 2015. The cement market contracted by 9% in January-April 2015, although the decline slowed to 4-5% in May 2015, according to preliminary data.

The construction market is currently unfavourable for cement production as borrowing is too expensive, which slows new construction and gives developers an incentive to monetise projects at the implementation stage. "Developers are currently trying to complete projects that are already underway, so the consumption of finished products has increased and companies are reluctant to begin new construction projects, which takes a toll on cement consumption," said Eurocement president Mikhail Skorokhod.

However, longer-term forecasts are quite different. The cement industry of the Eurasian Economic Union (EEU), which comprises Russia, Belarus, Kazakhstan, Armenia and Kyrgyzstan, will likely receive about Euro4.42bn of private investment until 2020. "Speaking of plans until 2020, we expect to see the launches of about 40Mt/yr of capacity and about Euro4.42bn of private investment will be needed for that," said Skorokhod. Investments in Russia will account for about 80% of the total.

Eurocement has continued to upgrade its cement plants. All of its plants will switch to the dry-process for cement production by 2020. This will boost its production capacity to 60Mt/yr from 50Mt/yr at a cost of around Euro1.62bn. At the start of July 2015, a 1.3Mt/yr capacity plant will be commissioned in Sengileevsky, Ulyanovsk. The plant will have the option of shipping via the Volga river, reducing logistical costs.

Eurocement has also asked the country's biggest bank, Sberbank, for Euro567m of financing. "We expect to receive approval on this request from an interdepartmental commission," said Skorokhod. Sberbank has already approved Euro222m of the total request, which will be spent on the construction of its 10,000t/day Mikhailovsky plant in Ryazan. Eurocement has also requested Euro268m of financing from the Industrial and Commercial Bank of China and Bank of China. The request is currently being reviewed.

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Robert McCaffrey, Editorial Director

3rd Global CemPower Conference - Reviewed

The 3rd *Global CemPower Conference* on electricity issues in the global cement industry has successfully taken place in London on 1-2 June, with delegates from 18 countries and representatives of over half a billion tonnes of cement production capacity in attendance.

1: *Global Cement*'s Amy Saunders kicked off the presentation programme at the 3rd *Global CemPower Conference* with her look at the world's top cement producers and a review of the major global cement industry news in 2014 and so far in 2015.

2: Peter Edwards gave delegates the low-down on the likely effects of the Lafarge-Holcim mega-merger for markets around the world, based on *Global Cement*'s well-received *LafargeHolcim merger report*.

3: Jennifer Kuhnert from the Clausthal University of Technology introduced the concept of a high-temperature 'dust separator' to greatly increase the amount of waste heat energy that could be recovered from cement plants. She promised to return to the 4th *Global CemPower Conference* to present her results.

4: Petr Rayman from Rayman spor described the energy efficiency of different types of pneumatic conveying feeders.

The *Global CemPower Conference* is unique in cement industry meetings worldwide in that it concentrates on the latest trends in power economics for the industry, including the use of waste heat recovery, electrical energy efficiency measures, grinding efficiency, alternative power sources and captive power generation. Delegates rated the conference very highly for its technical content and its usefulness for making contacts.

Amy Saunders, deputy editor of *Global Cement Magazine*, started the conference by giving a review of the top cement producers around the world. Growth mainly stems from developing countries, with Sudan, Peru, Kazakhstan and Estonia leading growth rates over the period 2000-2012. China has slowed to a GDP growth rate of around 6%, with central and regional governments starting to eliminate excess cement capacity (although discussions with other delegates suggested that growth in China is 'flat' - already at 0%). A ban on 32.5 grade cement, new emission standards and a new carbon trading scheme will also bring major change to China. Amy pointed out that cement import/dumping 'wars' are likely to become more common as many more countries move into excess supply situations. The Middle East shows a robust level of growth at nearly 4%/yr, but faces major and multiple instability issues. Very strong growth is evident in sub-Saharan Africa, with capacity additions becoming the norm as populations grow and economies become more developed. Europe is coming out of a decade-long slump, but a Grexit could create a major bump in the road. North America shows robust growth, albeit from the bottom of the Great Recession, while central and South America show robust but patchy growth (with Brazil currently performing underwhelmingly).

Amy stated that Anhui Conch of China was the world's largest cement producer in 2014, with directly-owned production capacity of 240Mt/yr and with waste heat recovery (WHR) units on all of its cement plants. The second largest company was Holcim, with around 180Mt/yr of cement production capacity and the third largest was Lafarge with around 170Mt/yr: When combined, the two companies will become the largest in the world. CNBM/Sinoma operates around 160Mt/yr of cement production capacity directly, but operates up to around 400Mt/yr of production capacity through wholly- or partly-owned subsidiaries, which with different counting methods would make it the largest cement producer in the world, larger even than the merged LafargeHolcim. Cemex, Italcementi, Taiwan Cement, China Resources and Buzzi Unicem round out the rest of the world's top 10 cement producing companies.

5: Alexander Sharabaroff from the International Finance Corporation spoke about the economics of waste heat recovery in the cement industry.

6: Ino Tatsuo from Conch Kawasaki Engineering gave delegates a run down on waste heat recovery trends, particularly in south east Asia.

7: Sabrina Santarossa explained Turboden's experience with organic Rankine cycle (ORC) installations for waste heat recovery. Her presentation was voted best of all by delegates.

8: Enertime's Pierre du Baret outlined the benefits of refrigerant-based ORCs for medium-low temperature heat recovery in cement plants.

9: Self-proclaimed first day 'Headliner' Donald Cameron from Primasonics gave a concise account of the benefits of using sound blasting to avoid particulate build up problems.

10: Many delegates travelled from far and wide to attend the *Global CemPower Conference*. Here Byungjin Lee (left) and Junseok Kim (right) from Doosan Heavy Industries and Construction (South Korea) introduce themselves during the 'meet the delegates' session.

Peter Edwards, editor of *Global Cement Magazine*, next gave a presentation outlining the implications of the Lafarge-Holcim merger, based on a new Global Cement report. On 7 April 2014 the two companies announced that they would merge, and shortly after gave a list of pre-emptive divestments in order not to incur the wrath of competition authorities around the world. CRH has been lined-up to buy the majority of the divested assets, which are largely in Europe. The two companies had a slight divergence of fortunes, which has led to a renegotiation of the merger terms, meaning that Holcim will take a little more of the combined company than Lafarge: Eric Olsen of Lafarge has been confirmed as the new CEO. The merger has the overall effect of allowing the combined company to optimise its geographic footprint, will allow it to become the largest producer in the US and to own 170Mt/yr of capacity in fast-growing Asia. It will have 340Mt/yr of capacity in 62 mainly developing countries. Peter concluded though, that "Merging could be the easy part."

Jessica Kuhnert of the Clausthal University of Technology next gave an overview of energy generation for cement production. The energy consumption per tonne of clinker is 'no longer reducible' as long as cement remains based on the calcium system, since technology has advanced so that the actual specific energy consumption is close to the theoretical consumption. Jessica suggested that, alongside the reduction of energy and fuel costs, new process designs for combined heat exchange and dust recovery should be considered. A greenfield plant may be able to recover 40kWh/t clinker of WHR power, but in practice, the level comes in at around 25-30kWh/t. Jessica asked if a cyclone preheater is really necessary for the cement production process? A mooted 'Low Profile Process' would do away with the cyclone preheater, and a high-temperature 'dust separator' would be used as a core interfacing element instead: The cleaned exhaust gas at 750°C would then be used in a waste heat boiler. Through this approach, up to around 85kWh/t could be

11: Victor Lizarralde of Cementos Argos introduces himself to other delegates during the popular 'meet the delegates' session.

12: Discussions continue during lunch. Left to right: Frank Kassing (Santasalo Gears), Caroline Woywadt (Gebr. Pfeiffer), Anil Parashar (Binani Cement, UAE) and Alessandro Foresti (Turboden).

13: Delegates were welcomed onboard a London canal barge for the *Global CemPower* social evening. The boat trip started outside the conference venue in Paddington Basin before heading to London Zoo, Regents Park and Camden Lock.

14: Enertime's Pierre du Baret (left) and Frank Kassing from Santasalo Gears (right) during one of the coffee breaks.

15: Darren Bryant of Heatcatcher (left) and Finnian Gorman of Lagan Cement (right) in discussion during one of the CemPower 'speed dating' sessions.

16: Deep in discussion: Dirk Schmidt of Promecon (left) speaks to Lafarge's Ignacio Mendez Alonso (right).

17: Turboden's Alessandro Foresti (left) 'speed-dating' with Binani Cement's Anil Parashar (right).

18: Delegates from Sika Services AG and Sika Ltd stand in front of the Sika stand. Left to right: Matthias Dietrich, Andrew Bourne and Nick Dawson. Sika is a producer of grinding aids for clinker grinding that help to save grinding energy.

19: Daniela Gewalt started the second day of the *Global CemPower Conference* by describing Orcan Energy's stackable and cost-efficient ORC modules.

20: Darren Bryant from Heatcatcher spoke about mitigating operational risks of waste heat recovery integration into existing lime and cement plants.

21: Aqylon's Antonio Mendes Nazare introduced a range of power purchase agreements for financing waste heat recovery projects in the cement sector.

produced. Jessica promised to tell delegates more when the applied-for patents have been granted.

Petr Rayman of Rayman Ltd of the Czech Republic next spoke about energy-saving innovations for pneumatic conveying. He first pointed out that the variety of feeder types used in the cement industry have their own advantages and disadvantages, with no one solution being 'the best:' Each approach must be chosen for the specific situation. In a pneumatic system, every part of the system has its own inner energy loss and the focus for development must be to reduce this loss. For example in a vessel feeder, there is an energy loss when the vessel is de-aerated to atmospheric pressure at the end of each conveying cycle, with the loss equal to around 10-20% of the total conveying air energy. In a rotary feeder, the energy loss comes from pressurised air leaking through the feeder, via the spaces between the body and the rotor and via empty rotor pockets, as well as the energy required to drive the rotor, totalling around 10-25% of system total required energy. In a screw feeder, the energy loss comes from the energy required to drive the screw and to drive the material through the feeder and can be 40-55% of total required energy. A Venturi feeder may have an energy loss of 50-65% of system energy requirements. Petr suggested that a gravity-based flow feeder has less than 1% energy loss. Petr compared two systems, one a vessel feeder and one a flow feeder, in a Czech power plant, both conveying the same material over the same distance, and found that the specific energy consumption of the flow feeder was approximately half that of the vessel feeder.

Alexander Sharabaroff of the International Finance Corporation started off the event's main session, on waste heat recovery (WHR), by speaking on financing options and cement market analysis. The IFC is a major investor in the cement industry, helping to finance projects in many developing countries and able to finance projects in higher risk 'frontier' countries. "The recent financial crisis has put a strain on spending and the IFC proposes off-balance sheet structures to limit the financial impact of the financed project while accelerating sustainable development," he stated. Alexander reported that the IFC has favoured the basic steam Rankine cycle as a WHR system, due to its relative simplicity

and capital cost benefits. Access to a reliable electricity supply is worth paying for - and a WHR system can go some way to making a cement plant less reliant on an unreliable power supply. Alexander forecast that Chinese WHR unit equipment suppliers are likely to concentrate on projects outside of China, since WHR units are now ubiquitous in China and the market there is saturated. Installed capex costs range from US$1100/kW in China, up towards US$3000/kW in Europe and North America, with a payback time of 2-8 years, depending on the electricity tariff and with an IRR of 14-17%. Alexander gave an overview of the WHR potentials of a number of countries, based on electricity prices, political stability, market size and other factors. India has the most potential, followed (distantly) by Turkey, Vietnam, Mexico, Egypt, Thailand, Brazil and Pakistan. Alexander elucidated the off-balance sheet approach to financing, which has been popularised by cement companies having less robust finances, while at the same time wanting to de-risk their investments. For example, a new WHR unit might now be financed by the equipment supplier, backed by a heat supply agreement with the cement plant and an off-take agreement where the cement plant commits to purchase the generated power at a particular (discounted) cost.

Mr Ino Tatsuo of Anhui Conch Kawasaki (ACK) spoke about recent trends in WHR in Southeast Asia. The company can supply boiler and CK Mills as well as other cement manufacturing equipment. In total, the company (including Kawasaki Heavy Industries references) has 235 references in waste heat recovery, dating back to 1982 in Japan and back to the first WHR unit installed in China, back in 1998. The company also installed the first WHR units in India, Germany and in Vietnam. ACK also installed the world's largest WHR unit, for Anhui Conch's Wuhu cement plant in China, with a total capacity of 67MW, working on six large kilns. The company's WHR units have an average availability of 97%, based on long-term stable operation. The PH boiler is installed next to the preheater tower, while the AQC (air quenching cooler) boiler is situated next to the cooler, with both boilers supplying steam to a central turbine. The condition of the dust in a PH boiler and an AQC boiler is different, so that they require different heat exchangers, boiler designs and dust handling systems. Mr Tatsuo mentioned that a WHR system can be applied to an alkali bypass line, just so long as the gas temperature is lower than the dust melting point. In addition, the exhaust gas from a gas engine can be used for WHR, if the plant is equipped with gas engine sets for captive power generation, for example, while a captive coal-fired boiler (CFB) may also be similarly equipped...

22: Min Wu from Nanjing Kesen Kenen Environment & Energy gave delegates a run-down of his company's waste heat recovery project at Sharjah Cement in the UAE.

23: Promecon's Dirk Schmidt outlined how online control and optimisation of gas flows in vertical roller mills can save energy (and money) in cement plants.

24: Matthias Dietrich from Sika Services explained how Sika grinding aids can reduce energy requirements in cement mills.

25: Anil Parashar from Binani Cement explained how his grinding plant has optimised its use of electrical energy against the backdrop of (occasionally difficult) negotiations with the authorities in Dubai.

Scan the QR code below or enter the bit.ly code into your brower to read more of the review of the *CemPower Conference* in London and to see the conference photo gallery.

See more
http://bit.ly/
1HWuoTh

26: Frank Kassing from Santasalo Gears explained how bevel planetary gear units can increase electrical efficiency in vertical roller mill applications.

27: Jonathan Selwyn of Lark Energy gave the final presentation of the *Global CemPower Conference*. He described his company's various solar energy projects in the UK, including a large installation at the Hanson Ketton cement works in Rutland.

28: The three best presentations, as voted for by delegates, were 1. Sabrina Santarossa (Turboden), 2. Dirk Schmidt (Promecon, left) and 3. Peter Edwards (*Global Cement*, right).

News in brief

US: MCC plans terminal work

The Port of San Diego in California has entered a conditional agreement with Mitsubishi Cement Corporation (MCC) for potential future operations at Tenth Avenue Marine Terminal. MCC would operate a marine transfer and storage facility for the import, distribution, export, handling and storage of bulk cement, cement-related products and aggregate.

Barbados: Arawak Cement plant troubled by cocaine

Ryon Marlon George has been sentenced to seven years in prison after pleading guilty to importing 19.6kg of cocaine, worth around US$1m, at the Arawak Cement plant. The contraband was found on the MV Fairland cargo ship, which was en route to the Arawak Cement plant, on 15 January 2015.

US: Ash Grove settlement

Neosho County, Kansas has settled its long-running tax dispute with Ash Grove Cement. It now owes the cement producer US$6.5m in overpaid property tax. Payments of US$1.63m are due on 20 December of each year, ending in 2019.

El Salvador: Bemisal hits 50

Commercial and industrial packaging producer Bemisal is celebrating 50 years of operations in 2015 and has targeted 25% sales growth. It sells to the cement, chemical and retail sectors in 12 different markets, including Central America, Barbados, Jamaica, Mexico, Peru and the US from its two plants. Bemisal bought a Holcim subsidiary's sack plant in Metapan in 2014.

US: Quikrete turns 75

Quikrete, which manufactures packaged cement and concrete products for construction, repair and home improvement projects, is turning 75 years old in 2015.

US: Lafarge to build terminal

Lafarge North America has signed a deal to build a cement transloading facility and terminal in Williston, North Dakota. The facility will allow it to better serve growing demand for construction materials in the Dakotas.

Costa Rica: Inteco opens public consultation over new Costa Rica cement guidelines

The Costa Rican technical standards institute Inteco has opened a public consultation process on new technical guidelines for both imported and locally-produced cement. The agency seeks to establish a series of standards and guidelines for cement and its components.

Following a request from the Ministry of Finance, Industry and Trade (MEIC), Inteco launched a process to establish the new guidelines in 2014. The consultation process will be open until 27 July 2015 and will give players in the local cement market the opportunity to express their opinions. Cement producers Holcim and Cemex, as well as cement importer Sinocem, previously expressed their opposition to the MEIC's plans to introduce new certification requirements for cement to be approved by an internationally-accredited laboratory.

The move comes shortly after Inteco changed other cement rules. Bulk cement no longer needs to be sold on the day of production, while bagged cement older than 45 days can now be sold.

Brazil/Argentina: Camargo Corrêa plans sales

Brazilian industrial conglomerate Camargo Corrêa plans to sell a 10-18% stake in Intercement for US$648m to US$1.2bn in order to make new overseas investments. According to local media, Camargo Corrêa's US$2.66bn of debt has led it to seek a minority partner in order to take advantage of opportunities to grow in countries like Egypt, Mozambique and Paraguay.

Loma Negra, the Argentinian cement company purchased in 2005 by Camargo Corrêa from the Fortabat family in a US$1bn deal and later incorporated into Intercement, is expected to be sold. In 2011 Loma Negra began a US$400m four-year investment that includes US$250m to set up its 10th cement plant at San Juan, Puerto Rico.

Camargo Corrêa is one of several in Brazil with executives accused of paying bribes for contracts with state-run oil company Petroleo Brasileiro (Petrobras), threatening its access to public works contracts and driving up borrowing costs. Two Camargo Corrêa executives have already pleaded guilty.

US: Ash Grove announces death of former company chairman and president James P Sunderland

Ash Grove Cement Company has announced that James P Sunderland, former company chairman and president, died on 27 May 2015. Sunderland joined Ash Grove Lime and Portland Cement Company in 1957 as its corporate secretary in Kansas City. In his 43-year career at Ash Grove Cement, Sunderland held several leadership positions, including serving as the company's chairman and president. During Sunderland's tenure, Ash Grove Cement became one of the largest Portland cement producers in the US.

Paraguay: INC looks to expand fuels mix

Industria Nacional del Cemento (INC) plans to diversify its fuels mix to include other types of oils and possibly biofuels. The company has signed an agreement with the engineering faculty at Asuncion National University (FIUNA) to certify the use of biofuels. INC's president Jorge Mendez believes that, from 2016, INC may start using a variety of fuels, following a US$50m investment in its plant. This could save US$22m/yr.

Mexico: Cemex reports higher alternative fuels rate in 2014 sustainability report

Cemex has presented the results of its 2014 sustainable development report, stressing that it has responded to growing challenges in urban development, while highlighting the need for investments in long-lasting infrastructure, energy-efficient buildings and accessible housing.

Cemex's achievements include 600 infrastructure projects, amounting to more than 8Mm^2 of concrete for motorways, runways and streets in 14 countries, while it contributed towards the construction of 3150 affordable homes, covering more than 180,000m^2 in 12 nations. Since 1998, Cemex social programmes, including Patrimonio Hoy, ConstruApoyo and Centros Productivos de Autoempleo, have benefited more than 7m people, including 550,000 families. In 2014, Cemex substituted 28% of its fuels for alternative fuels. It also avoided the emission of more than 8Mt of CO_2, lowered worker accident rates by 33% and contract worker accidents by 23%.

Honduras: Cement plant announced

The Honduran government has signed an agreement with Italy's Goldlake Group to build a US$200m cement plant. It comes within the framework of the VII Italian-American Latin America and the Caribbean Conference. Economic development minister Alden Rivera announced that construction of the cement plant would start in July 2015 in the Valley of Agalteca.

Canada: Lafarge rebuilds Salmon Hatchery

Lafarge Canada has partnered with the Mossom Creek Hatchery in Port Moody, British Columbia, operated by the Burrard Inlet Marine Enhancement Society, to rebuild following a fire in December 2013. The Hatchery and education centre have recently been re-opened.

The new two-storey, 3200ft^2 building was built on a tight construction timeline to allow the hatchery to become operational for the 2015 salmon release. Lafarge worked with the hatchery to ensure the new building was durable and had a low environmental impact. Portland Limestone cement, which produces 10% less CO_2 emissions than Ordinary Portland cement, was used for the project.

The Mossom Creek Hatchery before the December 2013 fire.

global cement™

PHOTOGRAPHY COMPETITION 2016

Global Cement Magazine invites entries for the *Global Cement Photography Competition 2016*. The winning photos will be showcased in the January 2016 issue of *Global Cement Magazine*. The winner of the competition will also receive US$250 as a cash prize and the runner up will receive US$125. Anyone can enter and each individual may enter up to five cement-related photographs. Every entry to the *Global Cement Photography Competition 2016* must be accompanied by a separate MS Word document stating: Photographer's name, company, email and postal address; Location of the subject. Entry is simple and free: Please send your entry (digital only, JPG, RAW or Tiff format) by email to ***rob@propubs.com***. The subject line must be as follows: ***'Global Cement Photo Competition.'*** Files must be above 500kb but must be below 5Mb in compressed size. **GOOD LUCK!**

DEADLINE: 18 December 2015

2015 Finalist: ***'Hope Works by Moonlight'*** **-** Stephen Elliot, Hope Construction Materials, UK

"A view over Hope Cement Works taken during a full moon while on the night shift."

US: FTC completes vote on LafargeHolcim merger divestments

Following a public comment period, the Federal Trade Commission (FTC) has approved a final order settling charges that the LafargeHolcim merger would harm competition in 12 'already highly-concentrated' markets for Portland cement and two markets for slag cement. In the affected markets, Holcim and Lafarge are either the only two suppliers of Portland cement or slag cement or are, 'at most,' two of just four suppliers.

"If the merger between Holcim and Lafarge went through as originally planned, it would have likely had both short-term and long-term impacts on competitive pricing," said Greg Kerkstra, president and CEO of Grandville-based Kerkstra Precast. "Now that the FTC has determined a divestiture of some of these assets, that could actually encourage even more competition than before the merger, in our eyes."

Under the order, Lafarge and Holcim are required to divest cement plants, quarries, terminals and other assets in the 12 States of Illinois, Iowa, Louisiana, Massachusetts, Michigan, Minnesota, Montana, New Jersey, New York, Ohio, Tennessee, Wisconsin, as well as locations in Canada. The commission vote that approved the final order was 4-1. A Holcim-owned cement plant in Grandville will be sold to Buzzi Unicem USA as part of the divestments. The sale is expected to be complete in July 2015 and will be Buzzi's first venture in Michigan. No significant changes to operations are expected.

Brazil: Three die in cement silo collapse

Three workers were killed and three others were injured in the collapse of a cement silo on 30 May 2015 at the construction site of the Belo Monte hydroelectric power plant in the Brazilian Amazon. The accident occurred while a truck was delivering cement to the silos in the area where construction materials are stored, according to the Belo Monte Construction Consortium (CCBM). Pará State police are investigating the collapse of the 500t silo. The consortium's management will cooperate with the investigation 'with all the effort possible,' said the CCBM.

A rendering of the Belo Monte dam in Brazil.

Colombia: Cementos Argos' net profit up by 3.3% and Holcim Colombia reveals plans

Cementos Argos' net profit rose by 3.3% year-on-year to US$29m in the first quarter of 2015 due to increased sales in the US. The company posted an increase in income despite experiencing higher sales costs. Its consolidated income rose by 28% to US$630m, while earnings before interest, taxes, depreciation and amortisation (EBITDA) jumped by 18% to US$121m, the highest in the company's history. The increases were due principally to growth in the US, where cement income rose by 31% to US$264m.

"Today, 60% of Cementos Argos' income is generated outside of Colombia," said chief executive Jorge Mario Velasquez. "Added to the solid results in all our operations, dispatched volumes and generated EBITDA, we can be optimistic about 2015." Costs for the company rose by 33.3% year-on-year to US$469m in the first quarter because of bad weather in the US and increased transportation costs in Colombia caused by a brief truckers' strike. Velazquez confirmed Cementos Argos' plan to start operations in Chile and Peru. It is already present in the US, Haiti, Honduras, Panama and Puerto Rico.

Meanwhile, Jaime Hill Tinoco, president of Holcim Colombia, has confirmed the company's upcoming projects, which include the second stage of the connection between Puente Aereo (Terminal 2) and the new terminal at El Dorado airport in Bogota, La Felicidad shopping centre, a residential development in Madrid, Cundimarca and the construction of a Grupo Carso mall in Bogota. With regards to infrastructure projects, Holcim is participating in the construction of the Bogota-Villavicencio road and in the second section of the Ruta del Sol road project. The new infrastructure will also benefit the cement sector by improving transport routes.

In January-March 2015, Holcim Colombia posted a sales increase of 5%, below the national industry's average growth rate of 7.5%. Hill said that the difference was due to the truckers' strike, which forced distribution to be halted for a week. The company has forecast a 5% sales rise by the end of 2015, representing 15% of the 12.5Mt of cement that the industry expects to produce during the year. By 2020, it is expected that Colombia will produce 15Mt/yr of cement.

Colombia: Cemex hit by depreciation

Cemex Latam Holdings has reported poor results in the first quarter of 2015 in Colombia. As the company's share value in Pesos has dropped by 30% and it has recorded another 35% decline due to depreciation, Cemex Latam Holdings' value in US Dollars is 70% lower.

Company president Carlos Jacks has attributed the poor results to the 25% depreciation against the US Dollar and Cemex Latam Holdings' high 31% growth in 2014. Its decision that Colombia should generate the same cash flow or the same amount of US Dollars before the depreciation, which meant that it raised its prices, not anticipating an exchange rate reversal, also affected results.

Cemex Latam Holdings expects momentum in housing programmes and participation in the first wave of 4G motorway projects for the rest of 2015. The company plans to invest US$180m to expand the production capacity at its plant in Maceo, Colombia or its premises in Monterrey, Mexico.

Azerbaijan: Norm Sement branches out

Norm Sement plans to start oil well cement production in 2016, according to Norm Sement CEO Hasan Yalçinkaya. He said that oil well cement is highly sought-after in Azerbaijan and that by starting its production, cement imports to Azerbaijan would decrease.

"Today, the import of cement products to Azerbaijan is gradually decreasing. The share of imported cement is only 5% of the total market volume, while the share of clinker is 10%," said Yalçinkaya. Norm Sement is also preparing to export its products to the Caspian Sea countries. "Currently, we are considering the opportunities for exporting to Russia's southern regions, as well as to Kazakhstan and Turkmenistan."

Norm Sement's plant is located in Garadagh, Baku. It has a clinker production capacity of 5000t/day and a cement production capacity of 2Mt/yr. In 2014, the plant produced 540,000t of cement and 471,000t of clinker. Azerbaijan's domestic cement demand was 4.4Mt in 2014.

India: Kerneos starts work on calcium aluminate cement plant in Visakhapatnam

Kerneos India plans to complete the construction of its US$18.9m, greenfield 30,000t/yr calcium aluminate cement plant in Visakhapatnam in the next two years. The ground-breaking ceremony was held on 20 May 2015. The Vizag plant will be Kerneos' 12th manufacturing plant. Three of its plants are located in France, three are in China, one is in the UK and one is in the US.

Calcium aluminate cement is used mostly by refractory manufacturers. Its demand hinges almost entirely on the growth of the steel industry. Segi P Idicula, managing director of Kerneos (India and Middle East), said that the Vizag plant's capacity would be taken up as the market grows. India currently consumes 50,000t/yr of calcium aluminate cement as refractory binder. Kerneos supplies about 10,000t/yr to 30 Indian refractory makers from its French and Chinese plants. Kerneos expects to double its market share in the next five years.

Idicula said that the Indian Government plans to increase its steel production to 250Mt/yr by 2025. "At this rate, the Indian refractory industry will almost triple in size and there will be a corresponding rise in demand for calcium aluminate binders. We expect the refractory binder market to double to 100,000t/yr by 2020," said Idicula.

In India there are currently several small-scale merchant producers and refractory producers manufacturing the binders for captive use. Pierre Baillagou, Kerneos' industrial director, said that the company plans to sell the entire Vizag plant's production to the domestic refractory industry. "However, we do not rule out exports, as we have a strong market in Southeast Asia, the Middle East and Sri Lanka."

Afghanistan: Canadian businessmen to invest

After a meeting with the first vice president of Afghanistan Abdor Rashid Dostum, several Canadian businessmen said that they would invest a total of US$8bn in Afghanistan and later increase that amount.

The funds will be invested in the construction of a hydropower dam in Fariab Province and the extraction of gas and petroleum in Sheberghan City. Work to build a cement plant in Samangan Province, the extraction of coal in Takhar Province and gemstones in Badakhshan Province and an iron plant will also be part of their programmes. All activities will be under control of the World Bank, the Afghan government and other Afghan government institutions.

News in brief

India: Director of India Cements Capital resigns

N Srinivasan has resigned from the board of financial services company India Cements Capital (ICCL), part of India Cements.

Azerbaijan: Holcim Azerbaijan sees lower profit

Holcim Azerbaijan's net profit fell by 23.2% year-on-year to US$37.8m and its revenue fell by 27.1% to US$74.4m in 2014. Its production costs fell by 18.8% to US$53.4m.

India: Morgan Stanley buys 0.62% stake in Prism Cement

Morgan Stanley has bought a 0.62% stake in Prism Cement for US$4.98m. The 3.14m shares were purchased for US$1.58/share.

Kazakhstan: Steppe Cement chairman retires

Steppe Cement's Malcolm Brown has retired as non-executive chairman on 28 May 2015 due to health reasons.

India: JK Cement's profit down

JK Cement's net profit fell by 8.5% year-on-year to US$10.9m in the fourth quarter of 2015, which ended on 31 Mar 2015. Net profit for its entire 2015 financial year rose by 61.7% year-on-year to US$24.6m.

Kyrgyzstan: Qilianshan Cement to build cement plant

Gansu Qilianshan Cement and 8th Metallurgical Corporation plan to build a US$130m, 20:80 joint venture cement plant in Osh, Kyrgyzstan with contractor JBK.

Vietnam: Output up by 9%

Vietnam is estimated to have produced 26.6Mt of cement in the first five months of 2015, up by 9% year-on-year. The total includes 6.3Mt in May 2015.

India: Wonder Cement expands

Wonder Cement will invest US$500m to increase its production capacity to 10Mt/yr in the next five years from the current 3.25Mt/yr via the addition of two new lines.

Malaysia: Lafarge reports higher sales

Lafarge Malaysia's pre-tax profit for the first quarter of 2015, which ended on 31 March 2015, rose to US$27.6m from US$26.9m in the same quarter of 2014. Its revenue improved to US$193m from US$188m in the prior year due to higher cement and concrete sales in the domestic market on the back of market growth. The company expects the construction sector to continue to grow in 2015, driven mainly by the continued progress of key infrastructure projects and ongoing commercial and residential development.

Philippines: Eagle Cement to invest US$1.2bn on new plants and upgrades

Eagle Cement plans to invest US$1.2bn for two new 2Mt/yr cement plants at Cebu and Davao in 2015. The company is also adding a new 2Mt/yr capacity line to its existing cement plant in San Ildefonso, Bulacan.

"We are now finishing the second line and preparing to put up a third line," said Eagle Materials owner Ramon S Ang. Upon completion of the third line, the Bulacan plant will have 6Mt/yr of production capacity. Each 2Mt/yr capacity cement line will cost US$400m.

Australia: James Hardie's dividends

To the dismay of local media, James Hardie has rewarded shareholders with an ordinary second half dividend of US$120m and a US$98m special dividend.

In February 2015, Andrew Constance, who was then New South Wales treasurer, increased the state's loan facility to the Asbestos Injuries Compensation Fund (AICF) by more than US$100m after a blowout in expensive mesothelioma claims threatened to leave the fund short of cash. Constance amended the loan terms after the fund said in 2014 that contributions from James Hardie were likely to be insufficient and it would apply to the NSW courts to pay some claimants in instalments unless it received a top-up. Under the terms of an agreement struck in 2007, James Hardie pays 35% of its operating cashflow to the fund.

Group CFO Matt Marsh said that dividend policy was unrelated to asbestos liabilities. "The way we declare our dividends isn't related to the AICF," said Marsh. "We always prioritise making that payment to the AICF and then we start to allocate our capital that is left over." In 2014-2015, James Hardie paid US$113m to the AICF. It expects to make another payment of US$62.8m on 1 July 2015. James Hardie has paid US$718m to the fund since it was set up in 2007.

Chief executive Louis Gries said that James Hardie's plants were doing well in the quarter that ended on 31 March 2015 and that falling pulp and freight prices had reduced costs. During the quarter, earnings before interest and tax margins hit the top end of the group's 20-25% range. After focus on operational improvements in the past two years, the company will now chase sales. "We are definitely shifting more of our management attention to how we grow the top line rather than how we get efficiencies," said Gries.

James Hardie is aiming for fibre cement to account for 35% of the external cladding used in the US housing market, with James Hardie controlling 90% of that market. During the 2014-2015 year, the company spent US$173m on expansion projects to meet growing demand. Gries said that James Hardie's plants and capacity would keep expanding along with the housing recovery. James Hardie expects US housing starts of 1.1-1.2m in 2015-2016 and 'improved results' in the Asia Pacific region.

India: Malabar Cements' Pallipuram plant to reopen after six years

Malabar Cements' Pallipuram plant in Kerala, which has 600t/day of production capacity, plans to restart production after six years of closure. A trial run was started on 20 March 2015. The plant was shut in 2009 following a clinker shortage and labour issues. After funds were received from the state government in 2014, renovation of the plant for around US$780,939 went on for one year.

Thailand: SCCC announces alliance

Siam City Cement (SCCC) has announced an industry-wide distribution channel and marketing collaboration in the building material sector with 11 other construction materials producers. The INSEE Alliance, which includes companies that produce structures, roofing, walls, flooring and decorative materials, will bundle their product offerings to project developers and modern-trade stores. The INSEE Alliance will initially be aimed at project developers.

SCCC has already started to bundle its product offerings with pioneer partners JBP International Paint, Viva Industries and Ceramic Roofing Products. These partners and the newer members of the INSEE Alliance will also gain access to SCCC's nationwide distribution network. Other INSEE Alliance partners are Siam City Concrete, INSEE Superblock, Conwood, Thai Gypsum Products, UMI Group, Eco Coat, Karat Faucet and Aqua Line Pro Target.

The INSEE Alliance will help SCCC and its partners leverage their distribution networks, offering benefits to their customers in terms of enhanced varieties of products and sourcing costs, according to Siva Mahasandana, SCCC deputy chief executive and senior vice president of marketing and sales.

Meanwhile, Siva said that the departure of Holcim, which sold its 27.5% stake in SCCC in March 2015, had not affected its ability to sell its cement to overseas markets. Instead, SCCC has more freedom and flexibility to sell its cement to any market and will export about 3Mt of cement in 2015, which, according to Siva, is much more than 2014.

India: 10 new RDF plants coming to Karnataka

Household waste will soon be recycled into refuse-derived fuel (RDF) at 10 upcoming waste processing plants in Kalaburagi City, Karnataka. The RDF will be given to cement plants for use as fuel and the biodegradable waste will be used as manure by farmers.

The joint initiative taken up by the Karnataka State Pollution Control Board (KSPCB) and Karnataka Urban Infrastructure Development & Finance Corporation (KUIDFC) has made agreements with cement manufacturers like ACC, Vicat Sagar and UltraTech in Kalaburagi.

"Plastic-like material is a good alternative for fossil fuels as it can replace up to 20% of fossil fuels in terms of energy," said KSPCB chairman Vaman Acharya. The pact is yet to be signed and talks between the stakeholders are in the final stages. Transport costs for the RDF are estimated to be less than US$0.016/kg.

Indonesia: Cement sales decline further in May 2015

Indonesian Cement Association data show that cement consumption fell by 3.8% year-on-year to 22.9Mt in the first five months of 2015. Consumption has declined consistently since February 2015. The fall has been blamed on the country's slowing economy. GDP grew by 4.7% in the first quarter of 2015, the slowest rate in six years and since the start of the global financial crisis.

Cement consumption in May 2015 fell by 7.9% year-on-year, much steeper than the 1.1% decline recorded in April 2015. Lower sales in May 2015 occurred in most provinces, although East Nusa Tenggara and West Nusa Tenggara saw monthly sales rise by nearly 50% year-on-year. Commodity-based provinces experienced the highest declines during the month, with South Kalimantan and East Kalimantan making the steepest plunges with 41% and 24%, respectively. Even West Java, which traditionally has one of the highest cement consumption rates in Indonesia, suffered a sales decline of 8.3% year-on-year.

India: Lafarge to buy last 14% of Lafarge India

As part of the implementation of its planned merger with Holcim and subject to the merger's completion, Lafarge has signed a deal to acquire the 14% Lafarge India stake held by Baring for US$304m. Following the transaction and subject to the approval of the regulatory authorities, Lafarge will hold 100% of the shares of Lafarge India.

Indonesia: Holcim's first quarter profit down

Holcim Indonesia's profit for the first quarter of 2015, which ended on 31 March 2015, was down to US$2.49m from US$24.7m in the same quarter of 2014. Sales for the quarter were US$171m compared to US$180m in 2014. Gross profit was US$40.6m, down from US$52.5m in 2014, while operating profit was US$11.9m, down from US$28.5m in 2014.

"The cement industry as a whole faces some significant challenges, in the continued downward trend for this sector of the economy and the absence, so far, of anticipated stimulus from fiscal spending on upgrading infrastructure," said Kent Carson, CFO of Holcim Indonesia. "At the same time, competition has escalated significantly with considerable new capacity introduced, creating substantial oversupply in a market where costs continue to stubbornly climb."

Vietnam: FLSmidth to supply largest cement plant in Southeast Asia

FLSmidth has received a US$109m order from Vietnam's Xuan Than Group for a 12,000t/day capacity cement plant. The plant will be located around 100km south of Hanoi. It will be the largest cement plant in Southeast Asia with the most energy-efficient equipment, as well as state-of-the-art emissions control systems.

"The Vietnamese cement market is expected to grow over the coming years and it is a well-known market to FLSmidth, as we have been present in the country for many years. The construction of the largest cement plant in Southeast Asia proves our strong position in the area," said president of the cement division, Per Mejnert Kristensen. The order will be booked by the cement division and contribute beneficially to FLSmidth's earnings until mid 2017.

Japan/Singapore: Taiheiyo Cement launches new CEM II for Singapore

Taiheiyo Cement, which operates a cement terminal in Singapore through Singapore Cement Manufacturing (SCMC), a joint venture with Singapore-based Hong Leong Asia Ltd, has completed a new 24,000t cement silo at SCMC's cement terminal in Singapore. SCMC plans to use the new silo for a new export-product that it has developed specifically for Singapore.

Infrastructure investment, including subway and highway construction, is driving the robust cement market in Singapore and fuelling demand for low-heat-type cement to prevent thermal cracking in concrete structures with large cross-sections (so-called mass concrete). Accordingly, Taiheiyo Cement has developed a new cement that is made with Portland cement and admixture ingredients such as fly ash from coal-fired power plants. It qualifies as type CEM II as defined by Singapore's cement quality standard (SS EN 197-1). It has greater resistance to thermal cracking due to its low-heat and low-shrinkage characteristics, higher long-term strength, improved workability and lower alkali-silica reactivity. It is also certified under the Singapore Green Labelling Scheme (SGLS) and therefore carries a Green Label in recognition of its relative environmental friendliness.

Taiheiyo plans to manufacture the product using fly ash that has been selected, formulated and managed with the cooperation of domestic Japanese power companies. It is expected to contribute to the effective use of fly ash from newly-built coal-fired power plants in Japan.

Amy Saunders, Global Cement Magazine

The cement industry of China - 'A new normal'

The People's Republic of China (PRC), which spans 9,596,961km^2, is the world's second-largest country by land area, behind Russia. With an estimated population of 1.40bn in 2015, China is the most highly-populated country in the world. China is divided into 22 Provinces, five Autonomous Regions, four Municipalities and two Special Administrative Zones. Taiwan is China's '23rd Province,' although its status is contested and the region is governed by the Republic of China (ROC). China is home to a strong manufacturing industry and the world's largest cement market. Here *Global Cement Magazine* gives an overview of the Chinese cement industry and an update on developments since July 2014.

Economy

China is one of the world's BRIC economies, which also includes Brazil, Russia and India. The BRIC countries are characterised by newly advanced economic development. China has the world's largest economy with a GDP (Purchasing Power Parity - PPP) of US$17.63tn or US$10.36tn (using the official exchange rate) in 2014.[1] GDP comparisons are complicated as China's exchange rate is fixed rather than determined by market forces; to prevent underestimating China's output, GDP (PPP) is usually used for country comparisons. China's GDP has grown rapidly since 2006 (Figure 2) and its 2014 GDP/capita was US$12,900.

The Chinese economy is guided by the government's five year plans, which contain guidelines to promote economic growth. The current 2011-2015 plan targets 51.5% urbanisation, an 8%/yr GDP growth rate, a 7%/yr GDP/capita growth rate, keeping the population below 1.39bn and the construction of 36 million houses for low-income families. Planned infrastructure projects include a new airport in Beijing, the extension of high-speed railways to 45,000km and the extension of highway networks to 83,000km. China is increasing its focus on large scale hydropower and nuclear power plants, with new research being performed in the field of uranium-free nuclear power using thorium.

China is an industrial market world-leader with a massive output from the agricultural and manufacturing industries, particularly materials, chemicals, consumer products and luxury goods. It is the world's largest exporter and in 2014 it exported US$2.25tn of goods, up from US$2.21tn in 2013.

The PRC also has the world's largest labour force. In 2014 this was 801.6 million, of which 33.6% worked in agriculture, 30.3% in industry and 36.1% in the service sector. Unemployment rates are low at 4.1%. China's population grew at a rate of 0.44% in 2014.

Right - Figure 1: The Great Wall of China at Jinshanling is a series of fortifications made of stone, brick, tamped earth, wood and other materials. It is built along an east-to-west line across the historical northern borders of China.

Cement industry overview

At the start of the PRC in 1949, the Chinese cement industry was relatively small with many small cement kilns spread throughout towns and villages.[3] In the 1980s a trend towards large integrated cement plants emerged and several government-owned cement producers were established to raise production. In 2000 the government began to reduce the number of small cement plants on the basis of their inefficiency and high levels of emissions. These efforts are ongoing.

According to the *Global Cement Directory 2015*, the Chinese cement industry consists of 803 integrated cement plants with a combined production capacity of 1.48Bnt/yr (Table 1, Figure 3). There are also 15 cement plants and 28Mt/yr of cement production capacity in Taiwan. Given the large number of remote cement plants and the lack of independent verification regarding the information supplied by Chinese producers, the data regarding plant numbers and production capacity is incomplete.

Official Chinese cement production statistics reported a 2.3% year-on-year increase to 2.48Bnt in cement production volumes in 2014.[4] This followed a 9.5% increase in 2013. Clinker production capacity was 2Bnt/yr in 2014, up from 1.9Bnt/yr in 2013.[5] In comparison, global cement production in 2014 was 4.18Bt, while global clinker capacity was 3.57Bnt/yr. China apparently possessed 59.3% of the world's cement capacity and 56% of its clinker capacity in 2014.

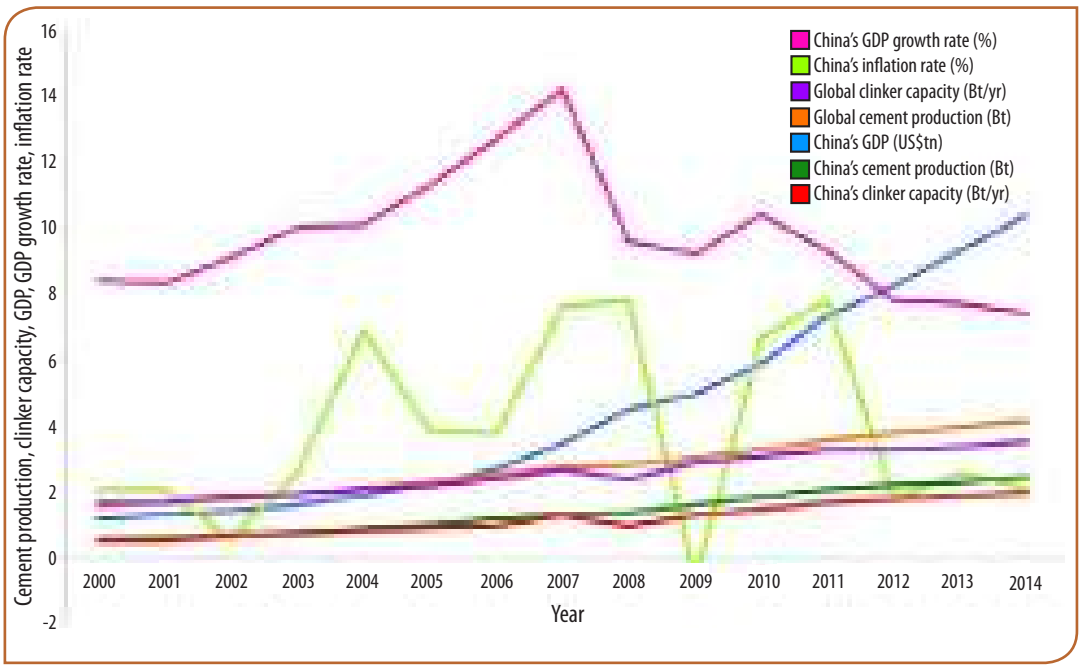
Suggestions that China has over-reported its cement production volumes have previously been made. However, evidence of unnecessary construction projects has been highlighted in local media, as has low capacity utilisation. The difference in construction industries suggests that China may be accurate in its production statistics:[6] For example, wood is scarce in China, but commonly used in the USA for house-building, so cement consumption will be higher in China even when construction rates are the same.

Cement companies

The top 20 cement producers in China and Taiwan operate 270 integrated cement plants with a combined production capacity of 861.48Mt/yr (Table 3). Discounting Taiwan, the top 20 producers have 265 cement plants and 845.1Mt/yr of production capacity. All of the companies are Chinese, with the exception of minority shareholders and Taiwan Cement.

The top 20 cement producers in China and Taiwan account for 56.9% of cement production capacity and 33% of cement plants. The disparity in percentages suggests that the top producers operate fewer plants with greater production capacities, in line with China's trend for consolidation. The remaining 43.1% of cement capacity in China and Taiwan is owned by hundreds of small cement companies, some with capacities as low as 50,000t/yr.

Anhui Conch is China's largest cement producer in 2015, with 219.13Mt/yr of cement production capacity from 34 plants. In its 2014 annual report the company cited a cement production capacity of 264Mt/yr, including its operations in other countries. Of its total production capacity, 70Mt/yr is from one cement plant with 36 dry-process kiln lines in Wuhu City, Anhui. In 2014, state-owned Anhui Conch acquired the following cement companies: Hunan Yunfeng, Shaoyang Yunfeng, Shuichyeng Conch, Kunming Hongxi and Goldsun Cement. It also completed 11 lines and 29 grinding units in China, as well as one line in Indonesia and several upgrades in Myanmar. In the near future, Anhui Conch plans to expand through further acquisitions and projects overseas.



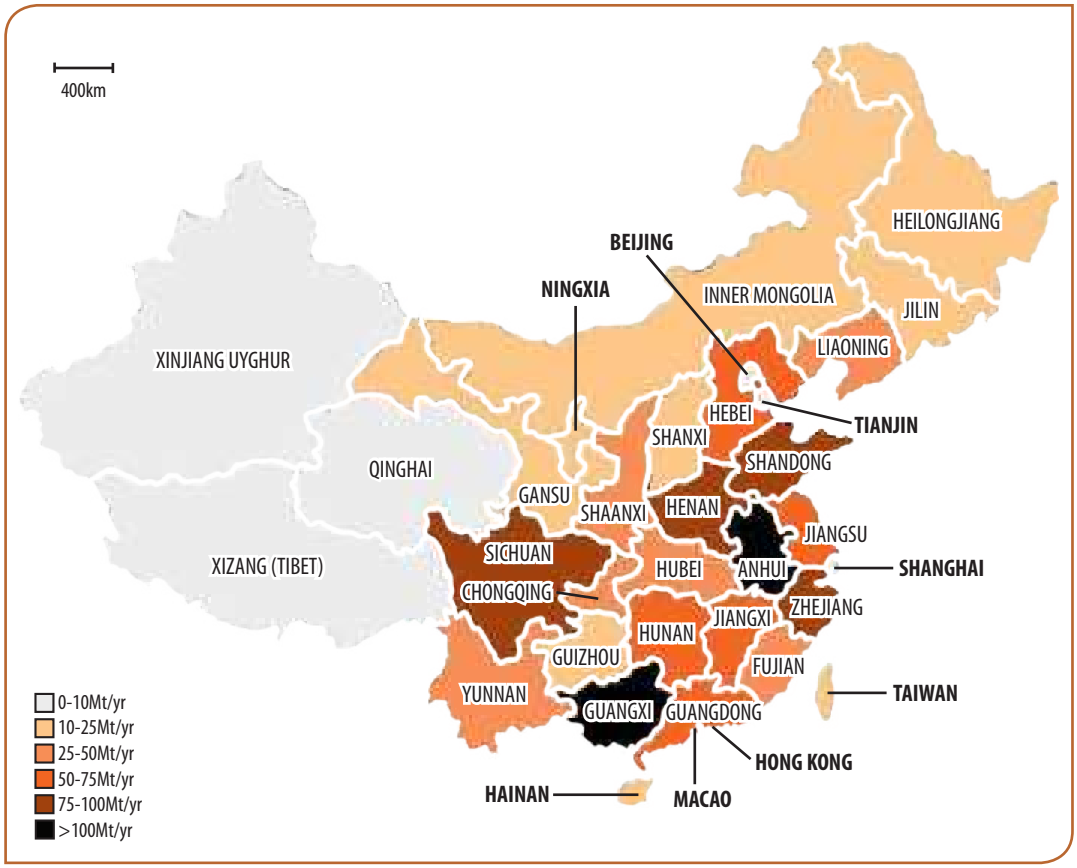
Left - Figure 2: China's GDP growth rate (%), China's inflation rate (%), global clinker capacity (Bt/yr), global cement production (Bt), China's GDP using official exchange rate (US$tn), China's cement production (Bt), China's clinker capacity (Bt/yr), in 2000-2014. **Sources:** IMF World Economic Outlook Database April 2015, World Data Bank, USGS Mineral Yearbooks.

Region	Plants	Capacity (Mt/yr)
Anhui Province	34	195
Beijing Municipality	6	4.68
Chongqing Municipality	19	30.0
Fujian Province	17	26.0
Gansu Province	26	19.6
Guangdong Province	27	71.3
Guangxi Zhuang Autonomous Region	37	107
Guizhou Province	28	19.0
Hainan Province	7	12.3
Hebei Province	21	58.5
Heilongjiang Province	13	12.0
Henan Province	47	83.9
Hong Kong Special Administrative Zone	0	0.00
Hubei Province	29	46.9
Hunan Province	30	55.6
Inner Mongolia Autonomous Region	15	20.2
Jiangsu Province	23	71.3
Jiangxi Province	27	56.2
Jilin Province	11	21.6
Liaoning Province	24	45.7
Macau Special Administrative Zone	0	0.00
Ningxia Hui Autonomous Region	15	12.1
Qinghai Province	10	4.74
Shaanxi Province	63	37.2
Shandong Province	43	79.4
Shanghai Municipality	3	1.56
Shanxi Province	11	13.1
Sichuan Province	81	93.1
Tianjin Municipality	1	1.56
Tibet Autonomous Region	9	2.38
Xinjiang Uyghur Autonomous Region	18	8.78
Yunnan Province	53	31.5
Zhejiang Province	54	97.6
Total	**802**	**1339.44**
Taiwan	15	28.0

Right - Table 1: The cement production capacity and number of plants in Chinese Provinces, Municipalities, Autonomous Regions and Special Administrative Zones in 2015. **Source:** *Global Cement Directory 2015*.

Region	Population (million)
Guangdong Province	106.44
Shandong Province	97.33
Henan Province	94.13

Far right - Table 2: The most highly populated Chinese regions in 2013. **Source:** Statista, the statistics portal.



Right - Figure 3: The integrated cement plants in China in 2015. The states are colour-coded by cement production capacity. **Source:** *Global Cement Directory 2015*.

China National Building Materials (CNBM/Sinoma) is China's second-largest cement producer, with an installed cement production capacity of 173.06Mt/yr at 92 cement plants. However, CNBM claimed a cement production capacity of 399Mt/yr in its 2014 financial report via the following subsidiaries, each of which owns a number of companies:

- China United: 100% stake - 101Mt/yr;
- South Cement: 80% stake - 148Mt/yr;
- North Cement: 70% stake - 33Mt/yr;
- Southwest Cement: 70% stake - 117Mt/yr.

Some 90% of state-owned CNBM's cement operations are in China. In 2014, it increased its stake in what it described as its most profitable other companies, including Conch Venture, Yatai Group and Shanshui Cement. It also announced plans to expand in India.

Taiwan Cement is China's third-largest cement company with 63.72Mt/yr of cement production capacity at six plants in China and Taiwan. Discounting the three cement plants and 10.6Mt/yr of production capacity in Taiwan, the company has three cement plants and 53.12Mt/yr of capacity in China, which would make it the country's fifth-largest producer. It claimed to have a production capacity of 65.3Mt/yr in China from 20 cement plants (plus 10.4Mt/yr from three cement plants in Taiwan) on its website. Taiwan Cement was established by the Taiwan provincial government in 1946 and was privatised in 1954. In 2014, it bought Sichuan Railway Group Cement, which has 2Mt/yr of production capacity. It aims to increase its production capacity in China to 100Mt/yr by 2016 via acquisitions.

China Resources Cement (**CRC**), part of China Resources Holdings, is the country's number four cement producer and was incorporated in 2003. Like Anhui Conch and Taiwan Cement, CRC operates a relatively small number (16) of cement plants, many of which have a larger than usual production capacity. CRC has a cement production capacity of 63.12Mt/yr in China. In its 2014 annual report, it said that it had 24 cement plants and 78.3Mt/yr of production capacity and, through equity interests and joint ventures, an additional 10.9Mt/yr of cement capacity. In 2014, CRC acquired Hainan Wuzhshan Dajiangnan Cement, completed two clinker lines, four grinding lines and started two 300t/day refuse-derived fuel (RDF) plants, in Guangxi and Guangdong. During the year, its capacity utilisation rate was '99.6%.'

Jidong Development Group is China's fifth-largest cement producer. It has nine cement plants and 36.07Mt/yr of cement production capacity in China. On its website, Jidong Development claimed that it has 49 production lines and 90Mt/yr of production capacity, although this data has not been updated since 2010. It also aims to have 150Mt/yr of cement capacity by 2016, including overseas capacity.

	Company	Plants	Capacity (Mt/yr)
1	Anhui Conch	34	219.13
2	CNBM (Sinoma)	92	173.06
3	Taiwan Cement	6	63.72
4	China Resources Cement (CRC)	16	63.12
5	Jidong Development Group	9	36.07
6	Tianrui Group	11	33.08
7	Jiangsu Jinfeng Cement Group	1	30.78
8	Shanshui (Sunnsy)	15	30.46
9	Lafarge Shui On Cement	23	27.69
10	Sichuan Esheng Cement	2	24.99
11	Asia Cement	6	22.95
12	Jilin Yatai Group	4	22.64
13	Huaxin Cement	11	20.26
14	BBMG Corporation	14	19.35
15	Jiangxi Wannianqing Cement	4	16.55
16	Shangfeng Cement Group	3	13.74
17	Fujian Cement	8	13.23
18	Inner Mongolia Mengxi Cement	6	10.48
19	Shandong Quanxing Cement	1	10.31
20	Prosperity Mineral Holdings	4	9.87
	Total	**270**	**861.48**

Left - Table 3: The top 20 cement producers in China in 2015 by installed production capacity. **Source:** *Global Cement Directory 2015*. **Note:** Includes 5.78Mt/yr (two plants) Asia Cement capacity in Taiwan and 10.6Mt/yr (three plants) Taiwan Cement capacity in Taiwan.

Financial trends

China's housing market is worth around 15% of its economy and its sluggish performance subdued construction in 2014. Infrastructure investments grew by 21.5% year-on-year while real estate investments were up by 10.5%, both significantly slower than in recent years. Cement production growth fell from 9.5% in 2013 to 2.3% in 2014.

China's cement industry has entered a 'new normal,' according to the country's larger producers. In its 2014 annual report, CNBM reported a 19.4% fall in cement industry investments. During the year, 81Mt/yr of cement capacity was removed and 70.3Mt/yr was added, while China's top 10 cement producers increased their market share to 52%.

China's monthly production volumes also show subdued growth. Cement production volumes fell notably between April 2014 and April 2015, with a significant drop in the first four months of 2015 (Table 4). Indeed, 2015 brought signs that China's construction market was slowing down at a faster rate. In March 2015, China offered tax breaks to home buyers and reduced deposit requirements for the second time in six months to halt a slide in house prices, which fell at a record rate in February 2015. In April 2015 China's national housing bank said that it might offer low interest rate housing loans to help middle and low income home buyers. Profits made by the Chinese cement industry fell by 67.6% year-on-year to US$521m for the first quarter of 2015, according to National Development and Reform Commission

Month	Cement production (Mt)
April 2014	226
May 2014	234
June 2014	232
July 2014	223
August 2014	225
September 2014	225
October 2014	234
November 2014	219
December 2014	204
January + February 2015	264
March 2015	161
April 2015	209

Above - Table 4: China's cement production volumes by month from April 2014 to April 2015.
Source: Statista.

(NDRC) statistics. Cement output fell slightly by 3.4% year-on-year to 428Mt in the same period.

Despite the changing economic environment, most of China's major cement producers reported strong results in 2014, with sales, profits and sales volumes all growing, albeit at a slower rate than in recent years. The story has been different in 2015, however, with producers reporting poor results.

In 2014, Anhui Conch's revenue grew by 99.5% year-on-year to US$9.95bn, its net profit grew by 16.9% to US$1.77bn, its cement production was up by 18% to 219Mt and its cement and clinker sales grew by 9.29% to US$9.49bn. These results followed record highs for its major subsidiaries in September 2014. Its Foshan subsidiary saw sales exceed 10,000t/day for five consecutive days in September 2014, with average sales stabilising at 8000t/day. However, Anhui Conch's revenue fell by 11.1% year-on-year to US$1.81bn in the first quarter of 2015 and its net profit fell by 30.7% to US$276m. It attributed the fall in profit to a drop in product prices.

CNBM reported a 3.7% year-on-year increase in revenue to US$19.7bn in 2014, a 4.3% increase in post-tax profit to US$1.39bn, a 2.1% increase in clinker and cement sales volumes to 291Mt and a 6.2% increase in cement production to 251Mt. Like Anhui Conch, in the first quarter of 2015 CNBM's revenue fell by 4.63% to US$3.40bn and its net profit fell by 45.8% to US$69.2m.

CRC reported that its 2014 turnover grew by 11.3% year-on-year to US$4.21bn and its profit grew by 26% to US$425m. During the year, CRC sold 72Mt of cement, some 7.3% more than in 2013. This afforded a 12.9% year-on-year increase in cement sales to US$3.14bn in 2014. However, in the first quarter of 2015, CRC's turnover fell by 8.7% to US$800m and its profit fell by 14% to US$85.1m. The falls were again attributed to lower prices.

Taiwan Cement reported that its net sales grew by 1.9% year-on-year to US$3.89bn in 2014 while its gross profit grew by 9% to US$817m. Its cement sales volumes were flat at 54Mt, although its Chinese sales were up from 45.5Mt in 2013 to 47.7Mt, while sales in Taiwan fell from 8.5Mt in 2013 to 6.3Mt in 2014. Taiwan Cement has not reported on its 2015 results.

In its 2014 annual report, Shanshui said that its 2014 revenues were US$2.51bn and that its net profit fell to US$539m, 'due to the slowdown in China's economic growth and deceleration in the growth rate of fixed assets investment.' Its 'high grade' cement sales grew by 12.5% year-on-year to 39.9Mt and its 'low grade' cement sales fell by 26.4% year-on-year to 13.2Mt. Shanshui's clinker sales grew by 6.5% year-on-year to 9.82Mt.

Developments at China Resources

In August 2013 questions about corruption at China Resources were posed by local media.[7] Issues around several coal mines and 'money squandering' at China Resources Power were raised. Then in April 2014 Chinese authorities detained Wang Hongkun, an executive director of China Resources Land.[8] Several others, including China Resources' chief executive Wu Ding and chairman Song Lin were investigated for corruption. China Resources has since appointed Fu Yuning as its new chairman. In June 2014 China's National Audit Office said that it had found irregularities in China Resources' operations, including the misuse of funds, the use of an improper bidding procedure and failure to seek government approval for a merger.

An audit of China Resources' 2012 financial statements showed that China Resources Power didn't conduct public bidding for 586 projects it awarded that were valued at US$1.9bn. Instead, it had invited specific bidders to decide on contractors and service providers. Moreover, five of China Resources Power's power plants were allegedly constructed or put into operation in 2012 without government approval. The plants had power sales of US$45.4m in 2012. Similarly, a US$28.1m merger involving CRC was made in 2012 without government assessment or approval. The audit also found that US$209m raised by two trust products, intended to boost liquidity at the trust company, was instead invested in property development by the borrowers. A resolution remains to be reported.

Environmental concerns

Concerns regarding China's air quality have been well-publicised due to severe health problems, including an increased incidence of cancers. Cement plants, power plants and the steel industry are all major contributors to China's pollution. In April 2015, Luoding City in Guangdong cancelled a plan to build a waste incinerator after it prompted a protest of around 10,000 people, during which three police cars were flipped over and a duty office was vandalised. "People are angry with the site selection of the incinerator as it is within 1km of their homes," said one resident. "The nearby (CRC) cement plant is producing enough pollution, we don't need another polluter." This incident reflects the sentiment of the general population towards polluters.

Emissions

Direct cement plant emissions are a significant problem in China. According to the Ministry of Environmental Protection (MEP), China's cement industry contributes 15-20% of $PM_{2.5}$ (particulate matter smaller than 2.5µm), 3-4% of SO_2 and 8-10% of NO_x to the country's total emissions.

In July 2013 China's State Council approved a five-year plan spanning 2013-2017 to invest US$277bn to

fight air pollution.[9] The plan targets 25% emissions reductions and has cut the emissions limits on cement plants via the new 'Emission Standard of Air Pollutants for the Cement Industry.' These have applied to newly-constructed cement plants since 1 March 2014 and to existing plants from 1 July 2015:[10]

- NO_x = 400mg/Nm^3
- SO_2 = 200mg/Nm^3
- PM at the kiln = 30mg/Nm^3
- PM at the grinder = 20mg/Nm^3
- Dust = 20mg/Nm^3

Cement producers anticipate that the new emissions limits will increase their operating costs. The installation of new emissions reduction technology like selective non-catalytic reduction (SNCR) systems has been a priority for all of the major producers.

Coal consumption

Coal is a major contributor to China's pollution. Cement plants in China consume coal as a raw fuel and via coal-fired power production. China's apparent coal consumption is declining as policy makers encourage the use of hydroelectric, solar and wind energy.[11] It is also pushing to restart its nuclear power programme. China's electricity consumption grew at its slowest pace in 16 years in 2014, according to data from the China Electricity Council. Its 2014 coal consumption fell by 2.9%, while CO_2 emissions fell by 2%, the first decline since 2001.

The 2013-2017 five-year pollution plan includes a ban on the construction of new power plants in three major regions in order to cap coal consumption to <65% of China's total primary energy use. The regions, Beijing-Hebei-Tianjin, the Yangtze River Delta region, which centres on Shanghai, and the Pearl River Delta region in Guangdong, are encouraged to replace coal with power purchased from other areas or with power from natural gas or nuclear power plants.

In March 2015 Beijing announced plans to close the last of its four major coal-fired power plants, China Huaneng Group Corp's 845MW plant, in 2016.[8] The plants will be replaced by four gas-fired stations with the capacity to supply 2.6 times more electricity than the coal plants. Beijing plans to cut its coal consumption by 13Mt/yr by 2017 from the 2012 level to slash pollutants. Shutting all of the major coal power plants in the city will reduce coal use by 9.2Mt/yr and avoid 30Mt/yr of CO_2 emissions.

Despite the apparent positive changes, questions regarding the accuracy of China's coal and CO_2 statistics have been raised.[11] China said that it would close 1725 'small-scale' coal mines in 2014, namely those with less than 900,000t/yr of production capacity,[12] but internal data inconsistencies, the large number of new coal mines being opened and news articles featuring the discovery of illegal and undocumented coal mines raise doubts about China's intentions. In 2014, China opened 47.3GW of new coal-fired power plants. Further, China's coal production is expected to grow from 3.7Bnt in 2013 to 4.1Bnt in 2015.[13]

Carbon trading schemes

Since 2011, seven regional pilot emission trading schemes (ETS) have been developed; in Shenzhen City, Beijing Municipality, Shanghai Municipality, Guangdong Province, Tianjin Municipality, Chongqing Municipality and Hubei Province. The ETS have faced criticism as historic emissions data are unknown, as are the names of many of the companies taking part.[14] However, Xie Zhenhua, vice chairman of the NDRC, said that the schemes will help China to create a low carbon economy.

In 2014, some 24Mt of CO_2 equivalents were traded via China's ETS,[15] valued at US$138m. This is expected to increase to 40Mt in 2015. Analysts have estimated that China's emissions will peak around 2030, although recent estimates have said that it may come as early as 2025, at 12.5-14Bnt of CO_2.[16]

In June 2015, cement producers participating in China's newest ETS in Hubei said that they could not afford to buy the permits to cover mitigation obligations for 2014 and may default. The 138 companies were due to provide the permits in June 2015 to settle their obligations for 2014. Around 25% are cement producers, which have complained that they were not allocated enough credits. "They are in talks with the government to gain immunity from non-compliance penalties and are asking to borrow some permits from the 2015 quota," said an unnamed broker. Huaxin Cement, the biggest local producer, is 1.15 million permits short of meeting its mitigation targets, according to Reuters. Carbon permits in Hubei are trading at US$4.43, so it could cost the company US$5.1m to cover its shortfall. "Most of the power sector is over-allocated on permits, but the cement and chemical sectors are short," said another unnamed broker. "Those facing a big gap are not attempting to buy from the market. They are pushing the government for a compromise." Penalties for non-compliance could include a deduction in permits for 2015 plus a fine of up to three times the value of the obligations in default, capped at US$24,176.

Below - Figure 4: The financial district of Pudong in Shanghai is just one of many regions of China suffering from the adverse effects of smog. **Source:** Reuters.

The pilot schemes have prompted China to develop a national ETS as part of its next five-year plan, which spans 2016-2020.[17] China's ETS will overtake Europe's to become the largest in the world. The scheme will be managed 'bottom-up,' so each region will receive an absolute emissions cap and will be responsible for distributing permits.[18] Each plant will initially receive free allocations, before moving to an auction system as the market matures. The regional and total caps are yet to be revealed.

Tackling overcapacity

Signs of overcapacity in the Chinese cement market were noted back as far as 2003.[19] In 2012 the NDRC warned that China was producing too much cement and that the country's capacity utilisation was just 69%.[3] In October 2013 China's State Council issued the 'Guideline to tackle serious production overcapacity,' while the Chinese Cement Association (CCA) drafted a plan to promote mergers and acquisitions to eliminate out-dated capacity and increase the industry's concentration ratio.

Several Chinese regions have now banned the construction of new cement plants, including Beijing in March 2014 and Tianjin in April 2014. Beijing also banned the expansion of existing cement plants. In April 2014 the NDRC announced a nationwide ban on 32.5 grade cement production from December 2015. This alone would reduce China's total cement production capacity by 340Mt/yr or 11%.

In December 2014 the CCA and the provincial governments jointly ordered 103 cement lines in the northeastern provinces of Heilongjiang, Liaoning and Jilin to close for four months from 1 December 2014 to reduce overcapacity and curb air pollution. The CCA said that the winter stoppage would reduce pollution as fuel consumption increases markedly when temperatures drop. Total cement output in northern China (including inner Mongolia), where capacity utilisation is around 50%, is around 120Mt in the winter and requires about 20Mt of coal. Fuel consumption falls to around 16Mt in the summer.

In September 2014 Japan's Taiheiyo Cement dissolved a 1.2Mt/yr joint venture cement plant with Xinjiang Tianye in Xinjiang. Taiheiyo Cement had signed the agreement with Xinjiang Tianye in December 2012. With the business environment for the region's cement industry worsening, Taiheiyo and Xinjiang Tianye opted to end the agreement.

Industry consolidation

Although according to China's major cement producers many acquisitions occurred in 2014-2015, leading to China's top 10 cement producers having 52% of the market share, only a small number of the acquisitions were reported by local media.

In November 2014 Gezhouba Group Cement, a subsidiary of China Gezhouba Group, signed an agreement with Hubei Zhongxia Cement to set up a joint venture to restructure the assets and businesses of Zhongxia Cement. The joint venture, with a registered capital of US$190m, will engage in the production and sales of cement, clinker, fine slag powder and opencast mining of limestone for cement uses. Gezhouba Cement holds 51% of the venture and Zhongxia Cement holds the remaining 49%. The venture acquired the entire cement assets of Zhongxia Cement after establishment.

In February 2015 Dongwu Cement acquired Shanghai Biofit Environmental Technology for US$5.11m. Shanghai Biofit is engaged in organic wastewater treatment, sludge treatment and disposal, comprehensive treatment of urban organic waste and other integrated environment services. The acquisition is in line with China's developing alternative fuels for cement production sector.

In March 2015 SOCAM agreed to sell its entire 45% stake in Lafarge Shui On Cement to Lafarge for US$329m. The joint venture company has 23 integrated cement plants and a cement production capacity of 27.7Mt/yr. The sale will make Lafarge Shui On Cement a wholly-owned subsidiary of Lafarge.

Overseas investments

The Chinese government's encouragement for its cement producers to expand abroad instead of at home prompted many overseas investments in 2014-2015.

A ground-breaking ceremony was held on 29 August 2014 at the site of a US$70m cement plant in Kemin, Chui, Kyrgyzstan. China's ZETH-Cement's general manager Zhu Rongjun said that the new plant would be put into production within 15 months.

State Development and Investment Corp (SDIC) and Anhui Conch signed an agreement on 25 September 2014 to invest in a 3Mt/yr cement plant in West Papau, Indonesia as part of investment co-operation measures that were agreed by China and Indonesia in 2013. The plant will serve Indonesia and neighbouring countries like Papua New Guinea. SDIC and Anhui Conch will have stakes of 51% and 49% respectively.

In November 2014 Hebei authorities revealed a plan to transfer excess capacity from its heavy industries, including cement, abroad by 2023. Hebei intends to move 5Mt/yr of cement capacity overseas by 2017 and 30Mt/yr by 2023. In February 2015 the Ministry of Industry and Information Technology (MIIT) released a similar plan to transfer the production capacity of six cement plant projects with 6Mt/yr of total production capacity from Sichuan to an undisclosed overseas location.

In January 2015 Jidong Development said that it would finalise discussions regarding the takeover of Peru's Cementos Interoceanicos. Cementos

World's largest slag mill

In July 2014 Loesche GmbH completed work on the largest slag mill in the world for Shanxi Taigang Stainless Steel Co (TISCO) in Taiyuan, Shanxi, China, achieving a new record production rate of 255t/hr of blast-furnace slag meal. The Loesche type LM 63.3+3 vertical mill was ordered by Taigang Group International Trade Co in September 2011 and started operation in March 2014.

Interoceanicos has an under-construction plant in Puno, Peru and holds mining rights to 54km^2 of land in Puno and other areas. Also in January 2015, the governments of China and Venezuela agreed to jointly build three 2500t/day capacity cement plants in Venezuela.

In February 2015 plans to build a cement plant in Zvishavane, Zimbabwe by Chinese investors were challenged as it emerged that the mining rights in the area belong to Shabanie Mashaba Mines (SMM). The project may be delayed as SMM is still the subject of an ownership dispute between the government and South African-based businessman Mutumwa Mawere. The project was part of deals made with China in 2014.

In March 2015 China's Hongshi Holdings and Nepal's Shiva Cement signed a US$300m joint venture agreement to build a cement plant in Nepal. The investment, one of the biggest in Nepal's cement sector, has a 7:3 equity structure between Hongshi Holdings and Shiva Cement. The dry-process plant will use 95% domestic raw materials.

In April 2015 Chinese cement producers planned to accelerate their investment in Zambia under agreements valued at US$800m. The deal was signed by the Zambia-China Economic and Trade Cooperation Zone and 11 companies in Beijing. One of the Chinese companies is West China Cement, which will set up a cement plant in the zone. "Zambia hopes to attract more Chinese investors and tourists to improve economic development," said Zambian president Edgar Lungu, adding that his government would provide 'strong support' to Chinese companies.

Also in April 2015, the government of Chelyabinsk, Russia and Anhui Conch were negotiating a cement plant project. Anhui Conch was provided several sites to assess for the project. According to general manager Wang Jianchao, a project scheme will be determined in the near future and will either consist of the modernisation of existing facilities or the construction of a new cement plant at undeveloped limestone deposits.

Outlook

The IMF has predicted that China's GDP will grow by 6.8% in 2015 and 6.3% in 2016, down from 7.4% growth in 2014 (Table 5).[20] This is faster than the world average and that of emerging and developing economies and around the same as the rest of emerging and developing Asia. While in world norms the Chinese market remains healthy, by China's norms the economy has slowed significantly. As GDP growth falls, new private investments will likely slow.

China's major cement producers have said that increased government infrastructure investment is expected to boost cement demand in 2015, although how far this will go towards negating the falling property market, which comprises 15% of China's economy, is arguable.

Region	2014	2015	2016
China	7.4	6.8	6.3
Emerging economies	4.6	4.3	4.7
Emerging Asia	6.8	6.6	6.4
World	3.4	3.5	3.8

Left - Table 5: GDP growth rate forecasts for China, emerging economies, emerging Asia and the world (%). **Source:** *IMF World Economic Outlook April 2015.*

More stringent emission standards, the rise in environmental compliance costs and the elimination of 32.5 grade OPC should speed up the closure of out-dated cement plants, facilitating industry consolidation and further reductions in overcapacity. Although the majority of China's cement plants are fitted with waste heat recovery (WHR) and other energy-efficiency technologies as standard, the use of alternative fuels is set to grow significantly in the near future as cheaper and more environmentally-friendly coal alternatives are sought.

The near future will herald major changes for China's cement sector, with a slowed economy and new technology all contributing to a 'new normal.'

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Amy Saunders, Global Cement Magazine

The cement industry of Afghanistan

The Islamic Republic of Afghanistan covers 652,000km² of land, divided into 34 provinces, in central Asia. In 2014, it had an estimated population of 31.8 million and a population growth rate of 2.29%.[1] The country is bordered by Pakistan, Turkmenistan, Uzbekistan, Tajikistan and China. Afghanistan has been ruled by a presidential republic with an elected president since 2004. In 2014, its first elected president, Hamid Karzai, was replaced by Ashraf Ghani, after serving for two terms. Despite having a vast wealth of natural resources and strong demand for construction materials, the country's cement industry remains weak. After providing an inside view of its only operational cement plant, the Ghori I plant in Pol-e-Khomri, Baghlan Province, in the latest issue, here *Global Cement* reports on the country's cement industry.

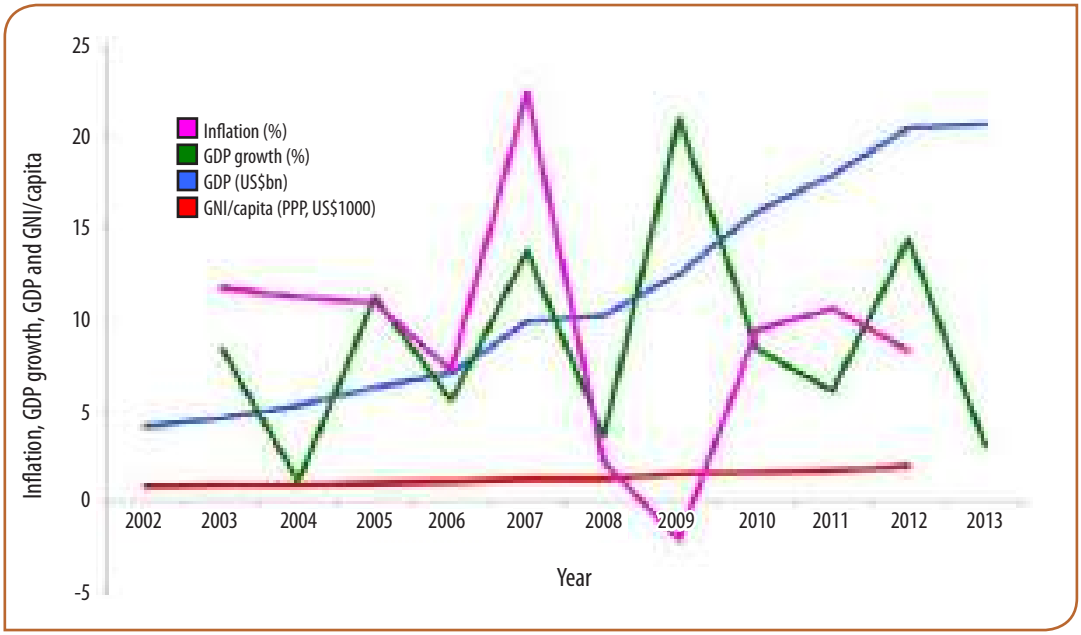
Economy

The Afghan economy has been damaged by decades of conflict and will likely take a long time to fully recover. The International Monetary Fund (IMF) has defined Afghanistan as a low-income emerging and developing nation. However, since the fall of the Taliban regime in 2001, the agricultural and service sectors have both experienced significant growth.

In 2013, Afghanistan's GDP (using the current official US$ exchange rate) grew to US$20.7bn, up from US$20.5bn in 2012 and US$17.9bn in 2011 (Figure 1).[1] GDP growth was 3.1% during 2013, down from 14.4% in 2012 and 6.1% in 2011. GDP/capita has remained stable since its 2012 value of US$1100, compared to US$1000 in 2011. Consumer price index (CPI) inflation was 8.3% in 2012, down from 10.6% in 2011 and 9.4% in 2010. Afghanistan's GDP is contributed to by the agricultural sector (20% - excluding opium production), industry (25.6%) and services (54.4%). In 2012, the labour force reached 7.51 million, of which 78.6% worked in agriculture, 5.7% in industry and 15.7% in the service sector.

In 2012 Afghanistan exported US$376m of goods, down from US$389m in 2011. The exports mainly comprised opium, fruits, nuts, fabrics, precious and semi-precious gems, destined for Pakistan (32.2%), India (27%), Tajikistan (8.5%) and the US (6.2%). In the same year, Afghanistan imported US$6.39bn of goods, up from US$1.15bn in 2011. The imports were mainly machinery, food, textiles and petroleum, from Pakistan (24.3%), the US (18%), Russia (8.7%), India (5.8%), China (5.6%) and Germany (4.4%).

Right: The Panjshir Valley in Panjshir Province is 150km North of Kabul and is home to around 140,000 people. The Valley has hosted several major conflicts over the years, including offensives fought during the Soviet War in 1980-1985 and Afghanistan's civil war in 1996-2001. It is a major centre for emerald mining.



Left - Figure 1: Inflation (%), GDP growth (%), GDP (US$bn), GNI/capita (PPP, US$1000) in Afghanistan in 2002-2013. **Source:** The World Bank Data Indicators Website.

Cement industry overview

A USGS study reported that in 2014, there were two cement plants in Afghanistan, both in the District of Pol-e-Khomri, Baghlan Province:[2]

- Ghori I: Two kilns with 400t/day of combined clinker production capacity; at the time of the report, the Ghori I plant was operating only intermittently due to a limited availability of coal.
- Ghori II: Two kilns with 1200t/day of combined clinker production capacity. *Global Cement's* contacts have reported that the Ghori II plant was never completed and does not currently produce cement.

A third plant, Ghori III, with 4000t/day of clinker production capacity, was expected to come into operation in 2013 (Figure 2). However, *Global Cement's* contacts have confirmed that construction has yet to begin. All of the Ghori plants are owned by Afghan Cement LLC, a subsidiary of Afghan Investment Company (AIC), which was until recently owned by former president Karzai's brother Mahmoud Karzai and other wealthy investors with government links.[3]

According to the USGS 2012 Minerals Yearbook, the most recently-available, Afghanistan produced 37,000t of cement in 2012, down from 38,000t in 2011, but up from 35,600t in 2010 (Table 1). In May 2013, domestic cement demand was estimated at 7Mt/yr.[4] Notably, just 571,000t of cement was legally imported during 2009-2010, at a time when demand was estimated at around 6Mt/yr.[5]

As there is just one operational cement plant in the country, factors aside from the country's economy dominate its operations. A 2012 report from Afghanistan's Ministry of Mines (MoM) stated that cement production in Afghanistan was the lowest in the world at 2kg/capita.[5] This is very low when compared to Pakistan at 92kg/capita, or the UK at 200kg/capita.

Non-operational cement plants

In September 2013, the MoM started the bidding process to construct new cement plants in Jabal-ul-Saraj District, Parwan Province and Pol-e-Khomri District, Baghlan Province and to complete a partially-constructed plant in Injil District, Herat Province.[4] In coordination with the US Defence Ministry, the MoM finalised the locations as future cement plant sites under the technical guidance of two foreign organisations. The proposed cement plants were expected to produce 1Mt/yr of cement each.

In May 2014, the MoM received offers for the plants in Herat and Parwan.[6] 15 companies expressed an interest in the bids, three offers were submitted and two proposals were received, from Lego Afghan Logistic and Zasu-Hongkong Union Holding. No updates have since been forthcoming. At the same time, the MoM said that a closed cement plant in Jabul Saraj, Parwan would be put up for bidding. The Jabul Saraj plant was the first to install a rotary kiln in Afghanistan.[2] The wet-process kiln has 100t/day of clinker production capacity and has not been upgraded since construction started in 1957. Production was halted in 1996 by the Taliban. During the Taliban regime, the plant was bombed 10 times. It has been inoperational since. No updates regarding new management as a result of the MoM bidding process have been made.

Recent attempts to render the Injil, Herat cement plant operational have failed. In March 2013, Iran's Pesghaman Company won a bid to complete the construction and

Year	Cement production (t)
2005	16,000
2006	25,000
2007	30,000
2008	37,300
2009	31,500
2010	35,600
2011	38,000
2012	37,000

Left - Table 1: Cement production volumes in Afghanistan in 2005-2012. **Source:** The USGS.

then operate the Injil plant. The 3000t/day capacity plant was originally partially-built in 1978, but construction was postponed when civil war broke out. It was never completed. The contract with Pesghaman Company was terminated because, according to the MoM, the company failed to meet the installed capacity in 27 months. This was attributed to a lack of essential technical and financial facilities to excavate the raw materials required for production.

"The Iranian company could not address the articles in the contract and its commitments in due time. Following review, the MoM terminated the contract," said MoM spokesman Ahmad Tamim Asi.

Cement imports

With just one active cement plant leading to a massive under-supply of cement on the domestic market, Afghanistan relies heavily on imports. According to the USGS, in 2005, the latest year for which it has data available, cement was imported from Pakistan (1.8Mt), Iran (400,000t), Uzbekistan and Turkmenistan (300,000t combined).[7]

Pakistan supplies the majority of Afghanistan's cement, mainly to the central and northern regions. Afghanistan comprises around 50% of Pakistan's cement exports. The Pakistani companies with the best access to the Afghan market are Lucky Cement, Bestway, Cherat, Lafarge, Fauji Cement and DG Khan Cement. Exports to Afghanistan currently contribute 30% of DG Khan Cement's total exports and 20-25% for Lucky Cement.[8]

However, Pakistan's exports to Afghanistan have fallen significantly in recent years, from a peak of 4.73Mt in 2010-2011 to 3.66Mt in 2013-2014 (Figure 3).[9] In the first six months of the 2014-2015 fiscal year, the 1.64Mt of exports is around half of the volume exported in the same period of 2013-2014, which was 2.07Mt (Figure 4). Exports were particularly low in July when 184,000t was exported, just 41.7% of the 441,000t exported in July 2013. The trend was attributed to the North Atlantic Treaty Organisation's (NATO) preparation to leave Afghanistan. NATO was the source of much of Afghanistan's cement demand, as it used large quantities to construct military bases and for reconstruction activities.[10] Once NATO troops left the country, Afghanistan's cement consumption was anticipated to be volatile, depending on whether civil unrest grew or if government development programmes continued. In January 2015, NATO launched its Resolute Support mission in Afghanistan.[11] NATO personnel numbers were reduced to 12,000 and activities changed to:

- Supporting planning, programming and budgeting;
- Assuring transparency and accountability;
- Supporting the adherence to the principles of rule of law and good governance;
- Supporting the establishment and sustainment of processes such as force generation, recruiting, training, managing and development of personnel.

In January 2015, Pakistan and Afghanistan started negotiations to sign a Preferential Trade Agreement (PTA) in order to increase bilateral trade to US$5bn over the next three years. Pakistan is expected to submit a draft PTA to Afghanistan to maximise its exports in cement and agriculture products by seeking a reduction in duty and taxes.

Right - Figure 2: Key cement industry locations in Afghanistan in 2014.

Cement plants:
1) Ghori I, Baghlan;
2) Ghori II, Baghlan (unfinished);
3) Ghori III, Baghlan (project);
4) Jabal Saraj, Parwan (closed);
5) Injil, Herat (unfinished);

Large high-quality limestone deposits:
• Darwazi Bala, Badakhshan;
• Pol-e-Khomri, Baghlan;
• Jabal-e Saraj, Parwan;
• Darra-i-Chartagh, Herat;
• Rod-i-Sanjur, Herat.

Coal deposits:
^ Ahandara, Takhar;
^ Dudkash, Baghlan;
^ Karkar, Baghlan;
^ Khurdara, Baghlan;
^ Sabzak, Herat.

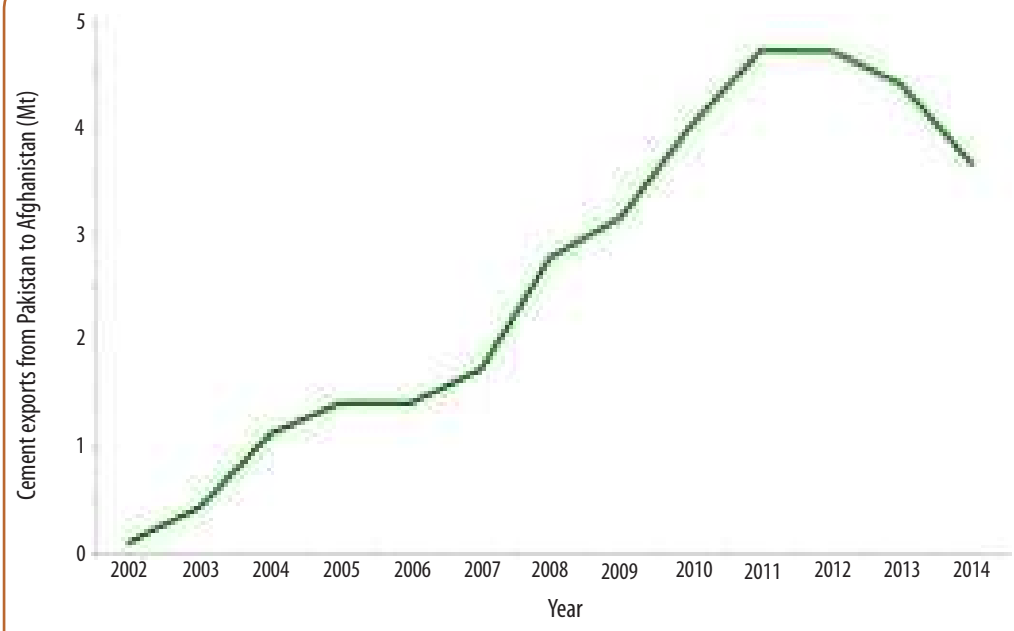
Power plants:
* Asadabad, Kunar;
* Gerishk, Helmand;
* Istalif, Kabul;
* Kajaki, Helmand;
* Mahipar, Kabul;
* Naghlu, Kabul;
* Pol-e-Khromri, Baghlan;
* Sarobi, Kabul;
* Northwest Kabul, Kabul (gas turbine).

Sources: The USGS, Griffin Capital, references 13-15.

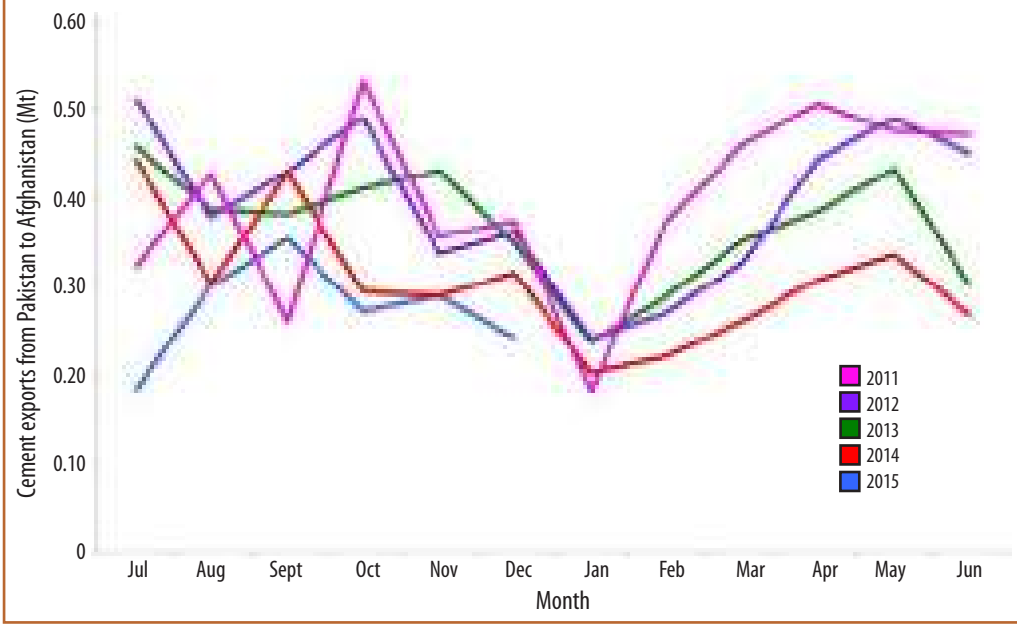
The large quantity of imported cement presents a challenge to Afghanistan's producers. Iranian cement production is heavily subsidised by its government, leading to lower cement prices on the domestic and export markets. Iran has one of the world's largest cement industries and in the 2013-2014 financial year, which ended on 20 March 2014, it exported >20Mt of cement. Uzbekistan, Tajikistan and Turkmenistan all have cement industries with growing production capacities and could soon begin to export larger volumes to Afghanistan, in line with demand.

In Pakistan, most cement plants are modern and energy-efficient, enabling low production costs. Additionally, Pakistan's producers allegedly sell cement at lower prices to the export markets, including Afghanistan, than in their home country.[8] In 2011, when the AIC and thus the Ghori I plant was owned by Mahmoud Karzai, Pakistani imports were blamed on the plant's failings. According to Karzai, Pakistan subsidises cement exports to Afghanistan for US$46/t, while the same cement in Pakistan costs US$76/t.[12] The claims of Pakistani cement dumping are currently under investigation by the International Trade Administration Commission (ITAC) following complaints from several African producers, including Afrisam, Lafarge, NPC Cimpor and PPC.[8]

Due to the low price of the imported cement, Afghan cement producers struggle to compete and need to reduce their production costs. Possible solutions include upgrading existing cement plants to increase energy-efficiency and addressing shortfalls in raw materials, fuels and electricity supply, which would enable the plants to operate at much higher cement production capacity.



Left - Figure 3: Cement export volumes (Mt) from Pakistan to Afghanistan in the 2002-2014 fiscal years. **Source:** The All Pakistan Cement Manufacturing Association (APCMA).



Left - Figure 4: Monthly cement export volumes (Mt) from Pakistan to Afghanistan in the 2011-2015 fiscal years. **Source:** The All Pakistan Cement Manufacturing Association (APCMA).

Raw materials

According to the USGS,[16] Afghanistan's mineral industry is characterised by small-scale operations whose production is supplied mainly to the local and regional markets. Many of the operations are state-owned, or else have strong links to the government. Such operations are typically inefficient and out-dated and, although the privatisation of state-controlled companies is ongoing, progress is slow. Additionally, the newly-created private sector companies are often just as ineffective. The Afghan mineral industry is inconsistent in its production statistics reporting, making analysis challenging.

Despite this, Afghanistan is home to plentiful quantities of cement-grade limestone, sand, gravel, clay, bauxite and gypsum for cement production.[17] In 2012, the mineral sector accounted for 20% of Afghanistan's GDP. Given the proportionally high costs of raw material transportation for cement production, cement plants should ideally be located close to their limestone resources. Large high-quality limestone deposits in the north and west of Afghanistan have been highlighted as ideal sites for future cement plants (Figure 2):

- Darwazi Bala, Badakhshan;
- Pol-e-Khomri, Baghlan;
- Jabal-e Saraj, Parwan;
- Darra-i-Chartagh, Herat;
- Rod-i-Sanjur, Herat.

Gypsum is a commonly-used raw material for cement production. Its production began to increase in 2010, from 46,400t in 2009 to 63,100t in 2010 (Table 2). Production volumes peaked in 2012 at 65,000t, the latest year for which data is available. Similarly, cement production rose from 31,500t in 2009 to 35,600t in 2011.

Energy and fuels

Around 50-60% of the production costs of a cement plant can be attributed to energy, when contributions from electrical and thermal energy are both accounted for.[17] Of the electricity consumed, some 66% is used to run the grinding mills. Although the Ghori I plant has an adequate electricity supply to support its current operations for 9.5 months of the year, new cement plants may struggle to secure such a reliable source. Indeed, the lack of nearby power plants was one of the reasons provided for the unfinished status of the cement plant in Injil, Herat.[J]

	Gypsum (t)	Cement (t)	Coal (t)	Gas (Mm^3)
2008	48,700	37,300	346,900	155
2009	46,400	31,500	500,100	142
2010	63,100	35,600	724,900	142
2011	62,000	38,000	750,000	145
2012	65,000	37,000	780,000	150

Right - Table 2: Gypsum, cement, coal and gas production volumes in Afghanistan in 2008-2012.
Source: The USGS Mineral Survey, 2012, Afghanistan.

Without a reliable supply of high-quality fuels and electricity, cement production operations must cease. This is a very costly process, given the high costs involved to restart operations. However, as for Afghanistan's mineral industry, its fuels and energy sectors are also largely dominated by the state. Gas is produced by Afghan Gas Ltd, part of AIC. Supplies have been inconsistent in recent years (Table 2), with a peak of $155Mm^3$ produced in 2008, which fell to $142Mm^3$ in 2009 and 2010. In 2012, gas was produced at Jawzjan Province.

Afghanistan is a net importer of electricity. In 2010, the country produced 986MkWh, consumed 2.49BnkWh and imported 1.57BnkWh.[1] There are currently eight hydroelectric power plants and one gas turbine power plant in Afghanistan, with 271.1MW of combined production capacity (Figure 2):[13-15]

- Asadabad (0.7MW), Kunar;
- Gerishk (2.4MW), Helmand;
- Istalif (0.2MW), Kabul;
- Kajaki (33MW), Helmand;
- Mahipar (66MW), Kabul;
- Naghlu (100MW), Kabul;
- Pol-e-Khromri-1 (4.8MW), Baghlan;
- Sarobi (22MW), Kabul;
- Northwest Kabul gas turbine (42MW), Kabul.

Although the hydroelectric power plants, which provide 84.5% of Afghanistan's electricity supply, are very environmentally-friendly, they are subject to seasonal challenges. Hydroelectricity is only available for 9.5 months of the year in Afghanistan. As such, the Ghori I plant, as well as any future cement plants, must produce their own electricity for cement production during the winter months.

The only power station constructed after 1983 is the 0.2MW Istalif hydroelectric plant in Kabul, which was established in 2006. Although small, the Istalif plant was taken as a symbol of a new era of growth for Afghanistan. However, no new power plants have since been constructed and poor electricity supply has continued to plague the country's industries.

Afghan Coal LLC, part of AIC, operates four of the country's most significant coal mines (Figure 2):

- Karkar, Baghlan:
- Dudkash, Baghlan;
- Khurdara, Baghlan;
- Ahandara, Takhar.

The Sabzak coal mine in Herat has had many owners over the years and has reportedly been subject to many illegal mining operations over the years, in which vast, unaccounted for, quantities of its reserves have been extracted.[18] Its current operational status is unknown and the USGS did not include it in its 2012 report as a currently-operational mine.

In a further blow to Afghanistan's fuels industry, as of 22 December 2014, exports of oil derivatives to Afghanistan were ceased due to 'impediments created by Afghanistan.' A customs officer of South Khorasan Province in Iran, Mohammad Ali Khashi Qaleh, said that, since December 2014, Afghanistan had specified new standards for the import of gasoline and gas oil to Afghanistan, namely the Euro 4 and higher standard.[19] Given that the producing companies did not conform, exports were ceased.[20] While it is laudable that Afghanistan wants to improve its fuel quality, in the short term it faces under-supply.

Outlook

The IMF's World Economic Outlook (October 2014 update) predicted that Afghanistan's GDP would grow by 3.2% in 2014 and 4.5% in 2015, higher than both the global and MENAP averages (Table 3). However, the recovery will be fragile and highly dependent upon the political environment. The CIA World Factbook has highlighted the following challenges for Afghanistan's economy:

- Low revenue collection;
- Anaemic job creation;
- High levels of corruption;
- Weak government capacity;
- Poor public infrastructure.

According to the USGS, the development of Afghan's mineral resources could provide a substantial boost to the country's economy. Mining output is, however, heavily dependent on foreign investment in transportation infrastructure.

Afghanistan's cement industry could be an ideal place for investment, as demand far outstrips supply and raw materials are plentiful. The MoM has predicted that cement demand in Afghanistan will reach 7.2Mt/yr by 2020.[5] However, the lack of electricity, transportation infrastructure and reliable fuel supplies, as well as volatile internal politics, provides a challenge to would-be market entrants. Importers and their distribution networks hold an unusually-large influence over the establishment of new plants.

Opium smuggled in cement truck

In January 2015, a cement truck destined for Tehran was raided by Iranian police in southern Iran.[21] Some 7t of opium that was being smuggled across the border from Afghanistan was confiscated. The Iranian authorities often confiscate large quantities of narcotics, but this seizure was the largest in months. Iran is the main route for drug smugglers to ship narcotics from Afghanistan to Europe. Authorities confiscate hundreds of tonnes of Afghan narcotics, mostly opium, every year.

	2013	2014	2015
Afghanistan	3.6 %	3.2 %	4.5 %
MENAP*	2.5 %	2.7 %	3.9 %
World	3.3 %	3.3 %	3.8 %

Left - Table 3: GDP growth rates (%) in Afghanistan, MENAP and the world in 2013 and predictions for 2014-2015. **Source:** IMF World Economic Outlook, October 2014 Update. *MENAP = Middle East, North Africa, Afghanistan and Pakistan.

Tajikistan, in particular, may be the source of new import competition soon. Although it is not currently a verified cement exporter to Afghanistan, it shares a border with the country and is looking forward to rapid industry growth. In January 2015, Tajikistan's Ministry of Industry and New Technologies announced plans to open six new cement plants by 2017, one of which is set to start producing in 2015.[8] The new capacity would exceed domestic demand, making Afghanistan a convenient export destination.

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Left - Figure 5: The poppy fields of Afghanistan provide the world's largest supply of opium. Its production relies heavily on child and forced labour, according to the US Department of Labour.

Ghana: Import challenges in Ghana

George Dawson-Ahmoah, chairman of the Ghana Cement Manufacturers Association (GCMA) has called for anti-dumping duties on cement imports to rid the industry of unfair trade practices by importers.

Dawson-Ahmoah urged the government to take its cue from South Africa, which recently imposed provisional anti-dumping duties on Pakistani cement. South Africa imposed provisional anti-dumping duties on cement from Pakistan from 15 May 2015 following investigations initiated by the International Trade Administration Commission of South Africa (ITAC) on 22 August 2014 after a number of local cement producers submitted an application on behalf of the industry.

Dumping occurs when companies export their goods to foreign markets at prices lower than what they charge for the same product in their home market. When dumping causes material injury to an industry in the market to which the products are exported, it is considered unfair trade.

Dawson-Ahmoah said that since countries are entitled to act in terms of World Trade Organisation (WTO) rules and procedures with an objective to level the playing field between domestic producers and foreign competitors, Ghana's government should act appropriately to defend the local market from undue price under-cutting, which has the potential to 'destabilise' the industry.

In other news, the GCMA has appealed to the Ministry of Finance to urgently commence investigation into what it described as the tax liabilities of certain bagged cement importers into the country. In a letter to the director of taxes at the Finance Ministry, the GCMA said that it had gathered that two importers, SOL Ghana and Fujiman Sentuo, had allegedly declared cost, insurance and freight (CIF) values of about US$27/t and US$30/t respectively. The letter, jointly signed by Dawson-Ahmoah and N Venketash, GCMA vice chairman/secretary, stated, 'The alleged values to us as seasoned manufacturers in the cement industry are unbelievable and call for the attention of the tax authorities. Such values, when confirmed, are under-valued, leading to a huge financial loss to the nation."

Algeria: Qalaa Holdings' revenue up 42.5%

Qalaa Holdings' revenue grew by 42.5% year-on-year to US$256m in the first quarter of 2015. Growth was driven mainly by operational improvements at ASEC Cement's Sudan subsidiary Al-Takamol, which recorded 157% year-on-year revenue growth. The energy and cement sectors contributed 71% to its consolidated revenues.

Qalaa Holdings' earnings before interest, taxes, depreciation and amortisation (EBITDA) stood at US$36.2m, an eight-fold increase on the same period of 2014. It had a net loss after tax and minority of US$14.7m in the first quarter of 2015, a 51.6% year-on-year improvement. Foreign exchange charges rose to US$6.95m, compared to a gain of US$1.71m in the first quarter of 2014. Qalaa Holdings' cement and construction unit ASEC Holding recorded US$10.2m in foreign exchange losses due to its stake in Dollar-denominated ASEC Holding Convertible.

Qalaa Holdings' plans for the future include several cement divestments. Negotiations are progressing for the sale of ASEC Cement's operations in Algeria, with an Algerian Holding Company in the cement industry being the natural buyer for Zahana Cement, as it already owns 65% of the company. The greenfield plant in Djelfa, Algeria is being bid for by two Algeria-based industrial groups.

South Africa/Pakistan: Pakistan to contest South African anti-dumping duties

The Pakistan government plans to challenge South African anti-dumping duties on Pakistani cement exports. It aims to hold bilateral consultations with the South African government to resolve the anti-dumping duties favourably. Failing that, the Pakistan government has the option to take the issue to the World Trade Organisation (WTO), according to an official from the Pakistan National Tariff Commission (NTC).

South Africa's International Trade Administration Commission (ITAC) imposed provisional anti-dumping duties of 14.3-77.2% on bagged cement originating in or imported from Pakistan from 15 May 2015 for six months. According to local media, Lucky Cement, the major supplier to South Africa with a 55% market share, seems to have had sales volumes little affected by the anti-dumping measure due to its low duty. However, Attock Pakistan, the second-largest supplier with a 35% market share, has been the worst hit due to its high anti-dumping duty.

Nigeria: UniCem to suffer US$45.2m losses in 2015

United Cement Company of Nigeria (UniCem) management has disclosed that it expects to suffer a US$45.2m loss in 2015 due to the economic downturn currently affecting Nigeria, including the devaluation of the Naira.

"The devaluation of the Naira impacts on our business because most of our transactions like procurement, payment of some of contractors, energy costs and servicing foreign creditors, are US$-denominated. Cumulatively, we will have a US$45.2m revenue loss in 2015 due to the devaluation of the Naira," said managing director Olivier Lenoir.

The construction of UniCem's line II project at Mfamosing, Akamkpa in Cross River State is on course. "The captive power plant is 85% complete and the civil construction of the second line is at 38%," said Lenoir. He added that the major challenges in the project are non-technical and include a high level of malaria infection, heavy rainfall and customs clearance problems. Lenoir said that, despite the hitches, UniCem is optimistic that the project will be completed on schedule by September 2016.

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20th AICCE '15

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Cairo, Egypt

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News in brief

Egypt: 15% growth at Suez Cement

Suez Cement plans to increase its energy intake and its production capacity by 15%, according to Bruno Carrè, the company's managing director in Egypt. It will convert two new facilities to use coal in 2015, adding to the two facilities converted in 2014.

Zimbabwe: Plant to displace 600 families

Over 600 families in Masvingo are set to be displaced by a new cement plant due to be built by China's Xhing Xhong Cement Company. 16 villages will be affected by the discovery of rich limestone deposits in the area. 200 villagers are expected to be employed at the plant.

Egypt: Arabian Cement's Q1 profit down

In the first quarter of 2015, which ended on 31 March 2015, Arabian Cement's revenues grew by 11% year-on-year to US$76.6m, but its net profit fell by 52% to US$7.34m. It said that higher transportation costs and the devaluation of the Egyptian Pound had impacted its results. Despite the tough quarter, it operated at 90% capacity utilisation and its market share grew by 1% to 8%.

Kenya: New mystery grinding plant

An unnamed company has filed with the National Environment Management Authority to build a new grinding plant in western Kenya. It is projected to produce 730,000t/yr of cement from imported clinker.

Egypt: National Cement's EGAS bill row

Egyptian Natural Gas Holding Company's (EGAS) dues from government-owned National Cement have hit US$131m. EGAS has demanded that its money be paid, but it remains undecided when it will receive the dues.

Tunisia: White cement production down

White cement production in Tunisia fell by 11.5% year-on-year to 141,000t in the first four months of 2015. According to the Ministry of Industry, white cement sales fell by 8.8% to 59,000t and exports fell by 14.6% to 87,400t in the first four months of 2015.

Egypt: Ecocem signs two new RDF deals

Lafarge Industrial Ecology (Ecocem) has signed two contracts to operate existing refuse-derived fuel (RDF) plants. It has signed a one-year agreement to upgrade a plant in Suez and a 10-year agreement to operate a plant in Qalyubeya. Ecocem has already added a new production line to the Suez plant and plans to build an additional line within one year. The plant will produce 42,000t/yr of RDF and the investment will total US$1.66m.

Nigeria/Ethiopia: Dangote steams ahead

Dangote Cement's gross profit rose by 10.5% year-on-year to US$375m for the three months that ended on 31 March 2015. Its revenues rose to US$576m from US$520m in the corresponding quarter of 2014. Net profit was up by 44.1% to US$345m. Cement sales volumes were up by 3.4% to 3.8Mt, driven by contributions from South Africa, Senegal, Cameroon and new lines in Nigeria. The margins from Nigeria increased due to pricing, improved gas supply and more use of coal.

"Senegal has made an excellent start, Cameroon is poised for a strong entry into an exciting growth market and Sephaku Cement is shaking up the South African market," said company CEO Onne van der Weijde. "Although sales fell in Nigeria, we improved both revenues and margins thanks to pricing actions in December 2014 following the collapse of the oil price and currency devaluation. We are investing to improve our logistical capabilities and I am pleased to report a much more favourable fuel supply situation in 2015. We have invested for growth in Africa and each new plant that opens will generate good returns as we deliver on our promise to become Africa's top cement company."

Dangote began trial production at its US$600m, 2.5Mt/yr capacity plant in Oromia, Ethiopia in May 2015. It has imported, with a duty free privilege provided by the government, 1.2m packaging bags from Egypt, as well as twenty-three heavy trucks, with more of both to come. Dangote has already announced plans to expand the Oromia plant, with construction set to begin before 2016. The plant will create 2000 direct jobs in the main plant operations and logistics, while 5000 indirect jobs will also be created.

Namibia: Growth for Ohorongo

Namibia's sole cement manufacturer, Ohorongo Cement, has said that 2015 has thus far seen excellent results compared to all of its previous years. It started production in 2011.

Managing director Hans-Wilhelm Schütte attributed the performance to an increase in infrastructure projects by both the government and the private sector, as well as export inroads made in neighbouring countries. Schütte noted that large infrastructure projects such as NamPort's port expansion and the Neckartal Dam had contributed to Ohorongo's performance.

South Africa: PPC hit by low demand

In the six months that ended on 31 March 2015, PPC's profit fell by 38% year-on-year, hurt by slack domestic demand. Its revenue rose by 9% to US$379m during the period.

South African building companies are struggling with weak demand as the government delays rolling out its US$84bn infrastructure investment package. In response, PPC is building cement plants in Ethiopia and the Democratic Republic of Congo as part of a wider plan to generate 40% of its sales outside its home market by 2017.

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 the latest prices, you should subscribe - **See page 64**. In this issue subscribers receive information from Bulgaria, Colombia, Ghana, Jamaica, Kenya, Saudi Arabia, Sudan, Philippines, USA and others.

India: The government has notified the rates for procurement of cement for National Highway Projects as US$2.68-3.44/bag (50kg), 25-41% cheaper than the current 'all India' average price of US$4.59/bag for May 2015 as calculated by Reliance Securities Ltd.

This price is marginally lower than in May 2014 and also lower than in April 2015. Local press reports that the average price did not rise in the first two weeks of June 2015, adding that, given the imminent onset of the monsoon season, it is unlikely that prices will 'recover' before the end of the year.

Some dealers say that cement sales are weak, as payment delays to contractors have brought some government projects to a standstill. Further, a subdued rural economy after unseasonal rains, low minimum support prices and low disposable income have hit rural demand.

The biggest month-on-month drop in prices was in the northern region, which posted an 11% cumulative drop over the last two months. All other regions, too, saw demand contracting, but with the south the 'best' performer.

Reliance's analysts added that there could be a 'downward correction' in private demand during the rest of 2015 and early 2016, putting increasing reliance on government works and infrastructure projects.

In the north east of India, however Nitin Gadkari, Union minister for road transport and highways, said that 10,000km of highway projects had led to a rise in cement prices. He warned cement producers not to exploit the situation.

"From US$5.20-5.52/bag, the prices have risen to around US$6.39-6.54/bag. There is a fear that it will continue to grow because of the rising demand triggered by highway construction," he said.

On 30 June 2015 Shree Cement announced a price increase of US$.015-0.24/bag in Delhi.

Indonesia: Indonesia's president has signed a decree allowing the government to cap prices of cement and selected other goods during peak periods. This includes religious holidays, especially the current month of Ramadan, which is usually Indonesia's biggest shopping 'season.' There is also the provision to regulate prices during what a spokesman called 'periods of price volatility.'

The decree follows on from an earlier move by the president in February 2015 to cap the cement prices of state-owned producer PT Semen Indonesia. At the time analysts suggested that this would have a knock-on effect at other cement producers. The new measures suggest that this 'proxy' price control measure has not been effective.

Malawi: The Ministry of Energy, Mines and Natural Resources plans to ban the general public from using trees for brick production, due to 'catastrophic' environmental degradation. It suggests that cement-based products will be a suitable alternative, but not until prices, currently around US$10.50 - 13.30/bag (50kg) can be reduced.

Werani Chilenga, Chairperson for Malawi's Parliamentary Committee on Natural Resources and Climate Management said, "For proper implementation and sustainability of such an order, the government should further reduce the price of cement. It is unrealistic to issue such a ban while cement prices are still high."

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

FOB {+ the named port of origin} = Free On Board: The delivery of goods on board the vessel at the named port of origin (loading), at seller's expense. Buyer is responsible for the main carriage/freight, cargo insurance and other costs and risks.

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.

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We have become slaves without knowing it - slaves to our devices.

Robert McCaffrey Editorial director, ***Global Cement Magazine (rob@globalcement.com)***

I think that it all began with those cutesy ads for the Apple iPod - the ones with a funky-looking youth in silhouette, wearing a very obvious pair of white 'ear-bud' ear-phones. They glorified personal choice, while at the same time closing the user off from interaction with other people. Listening to music while walking or running somehow eradicates part of the humanity of the wearer - they become 'apart.' I know - I've said 'Keep going' or 'well done' to any number of competitors in running races and been completely ignored because they were in their own little world. Not least of the anti-social effects of the iPod and its ilk is the pernicious tinny noise that they leak into the ears of other people (and the insidious devaluation of the pleasures of the noises of the real world - for example the wonder of bird song - and of the ultimate non-noise: silence).

The enslavement of parts of the human race by their devices seems to be accelerating as their devices become even more addictive. The iPod became more capable through its various iterations, culminating in the iPod Touch, which is a powerful computer that sits in the palm of your hand and which, via Wifi, can access the internet and everything on it. At the same time, the iPhone (and all those other smartphones, tablets and phablets) added calls, a camera, accelerometers, GPS and other bells and whistles to make them more incredible than anything that Captain Kirk could ever have dreamed of. Now, sitting in a railway carriage, walking along the pavement or even driving, people simply cannot resist playing with their devices. On a train, it's not a safety issue. However, surgeons have reported a new spate of injuries of people with smashed-in faces - who should be looking where they are going - who have walked smack into a pole, a lamppost or scaffolding while they have their face in their device and their brains in another dimension. As for driving and being on your phone, I saw a bumper sticker in the US recently that said 'Honk if you love Jesus - Text while driving if you want to meet Him.'

Our devices have captured our minds through an evolutionary arms race between skilled designers and our twinkle-obsessed caveman brains. The designers make their games or apps as addictive as possible (often they state this explicitly in their statements to shareholders) in order to capture eyeballs, game-play time and lucrative in-app or in-game purchases. It is in their interests to make the interaction as compelling as possible (if they don't, their competitors will out-addict them and capture their players). No wonder Sugar Candy Crush is so addictive (or so they tell me). In the same way, YouTube videos give you a plethora of similar choices to click on once you've seen one video ('Like that? You'll love this!'), Amazon will make its own suggestions as to what you might like to purchase next, and sites like Buzzfeed serve up an endless array of enticing stories ('clickbait') that are fun to read but that we really don't need. If you are weak, you will be hooked by the clickbait, and reeled-in. As the mayor of London Boris Johnson recently said, "I get up early - before 5am - and I work hard. The way to find time in your week is to cut out watching random TV and don't just sit there randomly surfing the internet and looking at 10 interesting things you never knew about Rihanna's bum. Cut all that out… it's a total waste of time."

Unfortunately, it is our children who are now bearing the brunt of this assault on their willpower. It is difficult for them to resist the blandishments of the internet and of their wonderful devices, and we must help them. Unfettered access to their devices will undoubtedly make a child into an internet-addicted, ill-mannered, socially-inept, semi-zombie. Bless them, my own dear children would undoubtedly prefer to interact with their devices rather than speak to a real person - even to me. That is precisely why we have a few rules at home:

- No devices upstairs (prevents late-night surfing);
- No devices at the meal table;
- A strict device-use curfew (currently 9.30pm);
- No YouTube channel or Facebook account (or similar) until the age of 13;
- Blocks on internet yucky stuff.

As the philosopher Aldous Huxley said, "A society, most of whose members spend a great part of their time, not on the spot, not here and now and in their calculable future, but somewhere else, in the irrelevant other worlds of sport and soap opera, of mythology and metaphysical fantasy, will find it hard to resist the encroachments of those who would manipulate and control it."

I wonder whether we risk being enslaved - or at the least emasculated - while we were engaged in something more 'enjoyable' such as playing some high definition first-person shoot-em-up? My own children, while trying to persuade me to install DVD screens in my old car, were surprised when I opened the sunroof and, pointing upwards, told them that we already had 'sky,' and in the highest high resolution there is - real life.

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  Deutsches Institut für Wirtschaftsforschung e.V.
- ÖPP einmal anders – funktioniert die ASFINAG auch in Deutschland?
  Dr. Klaus Schierhackl,
  ASFINAG Bau Management GmbH
- So wollen wir leben!
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- Industrie 4.0: Herausforderungen, Risiken und Potentiale der industriellen Produktion
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  Technische Universität Darmstadt
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Vormittagsplenum

- Warum ich Ingenieur geworden bin?
  Dr. Markus Wetzel,
  WETZEL & VON SEHT
- Moderne Wasserbauwerke und ihre Anforderungen an die Betontechnik aus der Sicht eines öffentlichen Bauherren
  Dipl.-Ing. Andreas Westendarp,
  Bundesanstalt für Wasserbau (baw)
- Zementwerke als genehmigungsbedürftige Anlagen – zukünftige Emissionsanforderungen
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  CEMEX Zement GmbH
- Verbrennungsführung in Drehofenanlagen der Zementindustrie
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  ThyssenKrupp Industrial Solutions AG
- Der Einsatz von Ersatzrohstoffen in Österreich
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  Vereinigung der Österreichischen Zementindustrie
- Oxyfuel-Technologie zur CO_2 –Abscheidung
  Dr. Kristina Fleiger, VDZ

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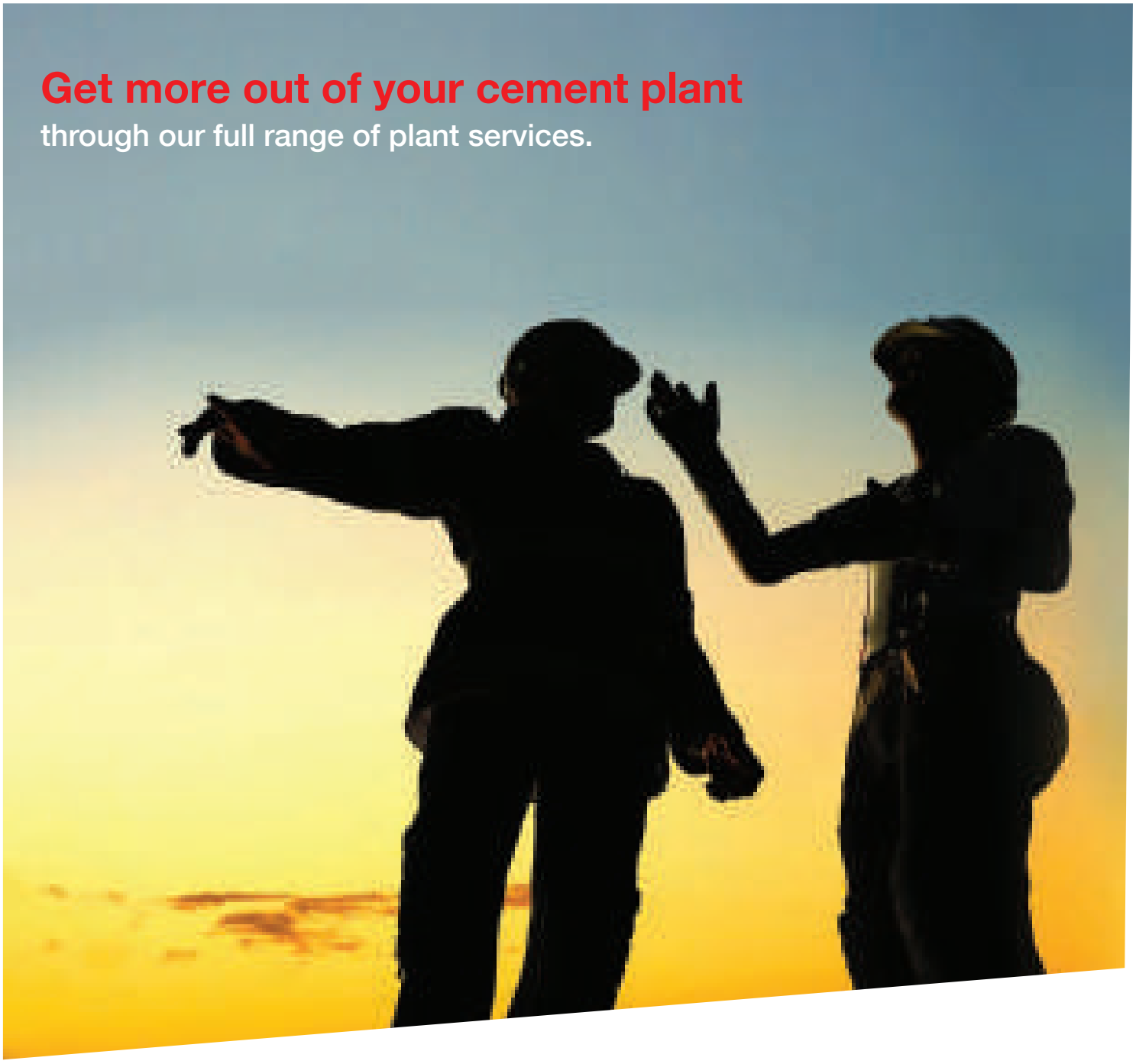

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