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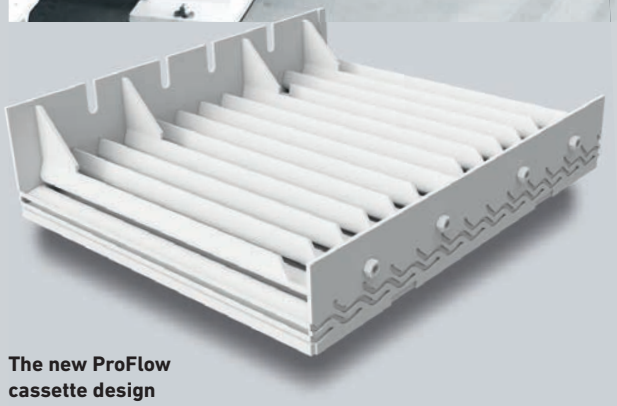
FEBRUARY 2025

global cement™ MAGAZINE

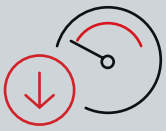
Our Pyrofloor²® cooler just got better

Our new ProFlow cassette design sets our Pyrofloor² cooler apart from the competition, dramatically reducing pressure drop for significantly enhanced cooling efficiency.

With its reliability, long operating life, and compact design, the Pyrofloor² cooler is the ideal choice for greenfield, retrofit, and replacement projects. Our expert process engineers ensure it fits into your process with minimum disruption, so all you have to do is enjoy the benefits.



The new ProFlow cassette design



45% lower pressure drop
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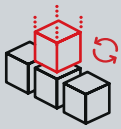
Autogenous wear protection
Extend equipment operating life while maintaining consistent cooling performance.

Intelligent slot design
Prevent clinker fall-through, yet allow homogenous air distribution.



Compatibility without modification
ProFlow cassettes fit into existing Pyrofloor² coolers without changes to seals or fixings.

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On the cover...

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Exclusive Official Magazine for

Global CemFuels Conference,
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Global Slag Conference,

...and Global Cement Virtual Events.

Dear readers,

Welcome to the February 2025 issue of *Global Cement Magazine* - the world's most widely-read cement magazine. This issue will be distributed at the forthcoming *Global FutureCem Conference* in Istanbul, Türkiye, on 5-6 February 2025. To tie in with the themes of this event, we have something of a decarbonisation special, taking in emissions reduction through calcined clay, waste heat recovery, process optimisation, new collaborations and more. We also see how the World Cement Association's Ian Riley expects cement demand to change over the 25 years to 2050. The forecast might surprise you and - Ian argues - it will greatly affect the amount of CO_2 that will be produced by the global cement sector.

Elsewhere in this issue, we continue our Leaders Series with Lebanon's Cimenterie Nationale, head to Cementos Argos' Cartagena plant in Colombia for a plant manager interview, look at the issues with obtaining fuels for cement production in Iran and - last but not least - catch up with the latest from Türkiye, host of the *Global FutureCem* event. There's still time to register. Head to www.futurecem.com to find out more!

PKEdwards

Peter Edwards
Editor

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Ian Riley, World Cement Association

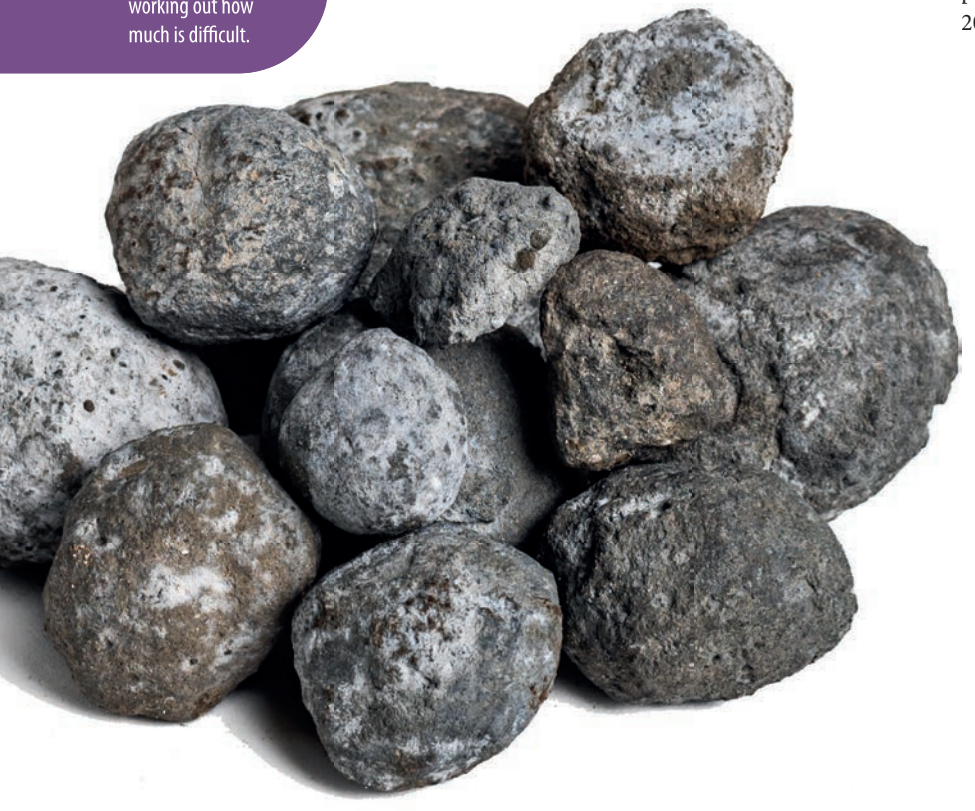
CEMENT DEMAND FORECAST 2050

The cement industry faces unprecedented changes over the next 25 years as it decarbonises. However, many of the factors that will have a large impact by 2050 are still at an early stage, while the timing of their impact is uncertain. This article looks at what their impacts might be and challenges the assumptions behind some of the more commonly cited long-term forecasts.

In 2024, a World Cement Association (WCA) member remarked that there was no available forecast for clinker demand in light of the impact of new technologies on clinker-free cements and the increasing use of supplementary cementitious materials (SCMs) and other clinker substitutes in cement.

A forecast for clinker demand is crucial, as it will help the sector to estimate its need for carbon capture and storage (CCS) installations, which are very capital intensive. Having a realistic view of the likely requirements is therefore critical for policy-makers and cement producers.

Much less clinker will be required in 2050 than today, but working out how much is difficult.



Conventional demand outlooks

In an excellent report that set out the challenges faced by our industry, the Energy Transitions Commission referred to the International Energy Agency's (IEA) 2018 report, which stated that the current global cement demand of ~4.2Bnt/yr is forecast by the IEA's Reference Technology Scenario to grow to 4.7Bnt/yr by 2050. This represents an increase of 12% from 2020 levels. Meanwhile, the Global Cement & Concrete Association's (GCCA) underlying assumption in its Concrete Future roadmap is a 'Business as Usual' increase in CO_2 emissions from cement production, from 2.7Bnt/yr in 2020 to 3.8Bnt/yr in 2050.

For reasons that I will outline later in this article, the WCA is of the opinion that these forecasts of significant growth are unlikely. Indeed, in its latest forecast, the IEA now projects flat cement demand (at 2020 levels) until 2035, followed by a 5% decline by 2050. WCA's estimate for cement demand in 2024 already shows a 9% reduction compared to 2020. It now expects a further decline in cement demand of 22% by 2050, resulting in a level of 3.0Bnt/yr in 25 years' time.

'Business as Usual' projections

In this context, 'Business as Usual' (BAU) refers to projections for cement demand *before* considering new developments that will reduce the demand for conventional, i.e.: Portland clinker-based cements. These include the replacement of concrete with other materials such as timber, the use of Portland clinker-free binders, design optimisation and improved resource efficiency. To assess likely demand, WCA has defined four types of markets, as shown in Table 1.

Ian Riley was appointed CEO of the World Cement Association in September 2019. Earlier, he held management roles in the UK, the US, Australia and Japan before moving to China in 1998. He entered the cement sector in 2006 with Huaxin Cement and became Greater China Country Head for LafargeHolcim (now Holcim) in 2014.

1 China: Decline then stable

In 2020 China saw cement demand of 2.4Bnt, representing 57% of all cement consumed globally in that year. Indeed, this ratio has remained roughly stable since 2014. This represents per-capita consumption of 1700kg/capita, far above the average of 300kg/capita in the rest of the world.

A comparison with other East Asian economies is instructive. In both Japan and Taiwan consumption dropped rapidly from their peaks of 700kg/capita and 1000kg/capita to around 350kg/capita and 500kg/capita respectively. However, South Korea is perhaps the closest comparison to China, with a peak of almost 1400kg/capita before the 1998 Asian Financial Crisis. The country has since maintained a level of ~850kg/capita. However, the drop in China is likely to be more pronounced (as a percentage of peak demand) for two main reasons:

1. The Chinese peak was sustained over eight years and the resulting cumulative consumption is significantly higher than South Korea's at its peak;

2. The Chinese government brought forward many infrastructure projects to prop up demand in the past five years due to lower GDP growth, bringing forward some demand from the next 5-10 years.

Indeed, cement demand in China fell by almost 25% from 2.4Bnt in 2020 to 1.8Bnt in 2024, an average decline of 7%/yr. WCA expects demand to continue to fall by 3.9%/yr to reach 1.2Bnt in 2035, a halving of demand in just 15 years. The decline will then decellerate to 1.6%/yr to reach 0.9Bnt by 2050, reflecting both lower per-capita consumption and a rapid decline in China's population.

2 Developed markets: Broadly stable

The markets considered here include the largely developed markets in Europe (including Türkiye), North America, North East Asia and Oceania. Combined, they represent just 13% of global demand for cement. Türkiye and some East European countries are still benefiting from enhanced demand from their development booms, but the impact of this is modest and will fade entirely by 2050. Demand growth is expected in North America and Oceania due to population growth, but declines are expected in North East Asia and Western Europe due to population declines. In 2024, these developed

Table 1: Split of global cement markets into four types

Market Type	Share of Global Cement Consumption (%)		Regions
	2024 (E)	2035 (F)	
1. China: Decline then stable	48	32	China
2. Developed markets: Broadly stable	13	13	NE Asia, Europe (incl.Türkiye), N America, Oceania
3. Middle-income nations: Slow and steady	22	26	CIS, M East, N Africa, Latin America, SE Asia
4. Emerging markets: Rapid growth	18	28	South Asia, Sub-Saharan Africa

Table 2: BAU projections for cement demand					
Market Type	Region	Cement Consumption (Mt/yr)			
		2020	2024 (E)	2035 (F)	2050 (F)
1. Decline then stable	China	2411	1825	1183	928
2. Broadly stable	North America	115	120	131	138
	Western Europe	131	126	129	125
	Eastern Europe and Türkiye	120	127	129	98
	Oceania	12	12	13	14
	North East Asia	97	97	89	85
3. Slow growth	South East Asia	236	240	275	297
	North Africa	93	97	111	131
	Latin America	164	176	202	215
	CIS	97	116	127	136
	Middle East	196	208	235	254
4. Rapid growth	South Asia (incl. India)	392	537	771	908
	Sub-Saharan Africa	130	153	207	308
TOTAL		**4194**	**3834**	**3602**	**3637**

markets are estimated to have demanded just under 0.5Bnt of cement, a level they are expected to maintain over the entire period to 2050.

3 Middle income nations: Slow growth

Middle-income countries, including those in the Middle East, North Africa, Latin America, CIS and Southeast Asia, will experience steady growth from 0.84Bnt in 2024 to 0.95Bnt in 2035 and 1.03Bnt in 2050. This represents an average growth rate of 0.8%/yr, slightly ahead of population growth, which is forecast to be 0.7%/yr. This is a heterogeneous group with different trends in different countries. Population growth varies considerably as does the stage of development.

Some countries, including Saudi Arabia and the UAE, will reach a stage of development where cement consumption will start to decline. Others, such as the central Asian republics, will continue to experience rapid population and per-capita consumption growth due to ongoing development.

4 Emerging markets: Rapid growth

Emerging markets in South Asia (including India) and Sub-Saharan Africa will see rapid growth in cement demand, almost doubling from 0.69Bnt in 2024 to 1.22Bnt in 2050, while population grows by 40% from 3.1Bn people to 4.4Bn. Per-capita consumption will increase from 220kg/yr to 280kg/yr, almost reaching Western European levels.

The pressure to decarbonise

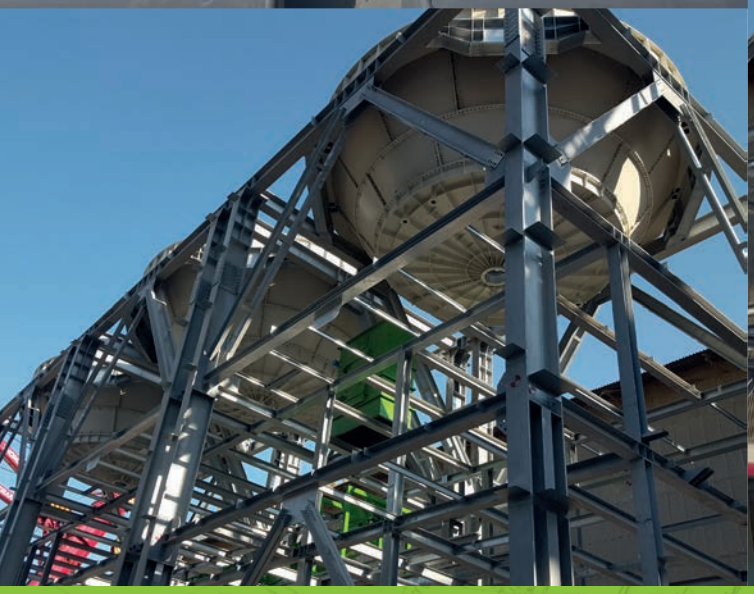
The granular picture outlined in Table 2 reveals why current BAU forecasts are likely to be wrong and explain why the WCA's estimate for cement consumption in 2050 is 3.6Bnt/yr. However, this is not the whole picture, as the pressure to decarbonise means we should not expect BAU to continue. Everyone in the cement industry is now aware of the ever-increasing pressure to reduce CO_2 emissions. Over the past 30 years the industry has cut per-tonne emissions by about 25%. However, the sector's customers are also under pressure to cut the CO_2 footprint of their projects, often faster than the cement industry can satisfy. This will lead them to take actions that will reduce the demand for conventional cement.

There have been several well publicised high-rise buildings that have used timber to replace concrete and steel. No doubt we will see more of this in the future. However, limitations in the supply of sustainable timber mean this will not replace a significant portion of concrete. Allied Market Research published an analysis of the mass timber construction market in 2023, which estimated a growth rate of 6%/yr between 2025 and 2035.

However, there is considerable waste in the concrete supply chain, where cement is ultimately put to use. In ready mixed concrete supply, this involves over-ordering and then dumping or returning excess concrete. In site mix supply, this involves using more cement than the mix design requires, as well as spillage and dust losses. In addition to the reduction of waste, there is considerable potential to reduce binder demand with greater use of admixtures and the addition of novel materials such as graphene and carbon nanotubes.

Current design practices have been based on cost considerations. As engineers and architects take into account the embodied CO_2 emissions, there will be reductions in the amount of concrete used to achieve specific objectives. The potential savings have been estimated at greater than 20%.

However, there may be easier ways to reduce embodied CO_2. Many companies are developing non-clinker binder systems, mainly based on geopolymer concretes that include steel slag, ash, mine tailings and other industrial by-products, as well as calcined clays. These are likely to be accepted initially for non-structural and sub-surface applications. These applications, which typically use C30 or standard grade concrete and have low risk/loss in the case of failure, are estimated to amount to more than 50% of all concrete used. They thus present a significant opportunity to reduce CO_2 emissions.



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Scenarios considered

Because of the uncertainty over if, and when, the factors above will play a significant role at scale, it is hard to quantify their impact precisely. However, it is clear they will reduce demand for traditional OPC-based cement even further. The WCA has therefore outlined three potential scenarios:

Scenario 1 - Slow change: There is progress on all issues but no step change in the rate of adoption from that seen at present;

Scenario 2 - Central forecast: The potential of new technologies will be fully realised in developed markets by 2050, with an ongoing transition elsewhere;

Scenario 3 - Rapid change: The full potential of carbon-saving technologies will be realised globally.

Table 3: Assumptions made in WCA's three forecast scenarios (Change 2020 v 2050)

Factor	Scenario 1 - Slow change	Scenario 2 - Central forecast	Scenario 3 - Rapid change
Loss of market to timber	4%	5%	6%
Reduction in supply chain waste	6%	8%	12%
Design optimisation	2%	5%	15%
OPC clinker-free cements	2%	8%	15%

Forecasts that include disruptive factors

In WCA's view, the cement industry has not widely recognised the forces outlined above and the possible resulting impact on cement demand. This could see a reduction from 4.2Bnt in 2020 to 2.4Bnt in 2050. This would have a major impact on supply/demand balance, pricing and profitability.

Table 4: Projections for global cement demand in 2035 and 2050 under three scenarios

Factor	Historical Situation		Scenario 1 - Slow change		Scenario 2 - Central forecast		Scenario 3 - Rapid change	
	2020	2024 (E)	2035 (F)	2050 (F)	2035 (F)	2050 (F)	2035 (F)	2050 (F)
BAU cement demand	**4194**	**3834**	**3634**	**3637**	**3643**	**3647**	**3643**	**3637**
Loss of market to timber			36	145	55	182	73	218
Reduction in supply chain waste			73	218	109	291	146	436
Design optimisation			36	73	73	182	146	546
Adjusted cement demand			**3498**	**3200**	**3407**	**2982**	**3297**	**2437**
Clinker-free cements			25	73	49	291	74	546
Conventional cement			3473	3127	3358	2691	3206	1891

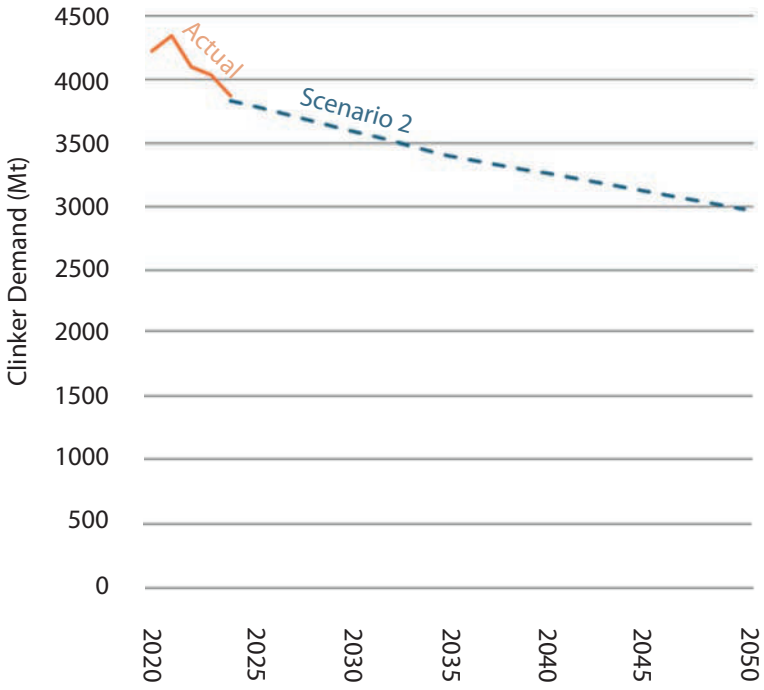


Figure 1: Scenario 2 compared to actual cement demand trend between 2020 and 2024 (Estimated).

If we look at actual demand trends between 2020 and 2024, the downward trend in cement demand (including clinker-free cements) is more rapid than in Scenario 2. However, cement demand is not the full story as far as the industry is concerned. In addition to the reduction in demand for conventional cement, we can also expect a continued reduction in the clinker factor. Scenario 2 is based on a 1%/yr increase in SCM use between 2024 and 2035, followed by an increase of 0.5%/yr from 2035 to 2050. This would result in a reduction in clinker factor from 73% in 2024 to 66% in 2035 and 54% in 2050. For comparison, the IEA forecast is 61% in 2035 and 57% in 2050.

The impact of CCS

For the cement industry, the worst option to reduce carbon emissions is CCS. It is expensive and energy intensive and projects involve a wide range of parties, which makes coordination complex. Furthermore, projects take a long time and often suffer delays. However, we do not have another way of reducing emissions all the way to zero.

The forecast for clinker demand is therefore critical to calculating what the demand for CCS will be. In 2024 clinker production is projected to be 2.8Bnt, a drop of 370Mt from its 2020 peak in just four years. This is projected by the WCA to fall to less than 1.9Bnt by 2050, possibly to as low as 1.0Bnt. This has significant implications for demand for CCS equipment and may be cause for optimism. Indeed, this reduction may be sufficient to allow full implementation of CCS solutions in the cement sector far more readily over the next 25 years than the sector has traditionally anticipated.

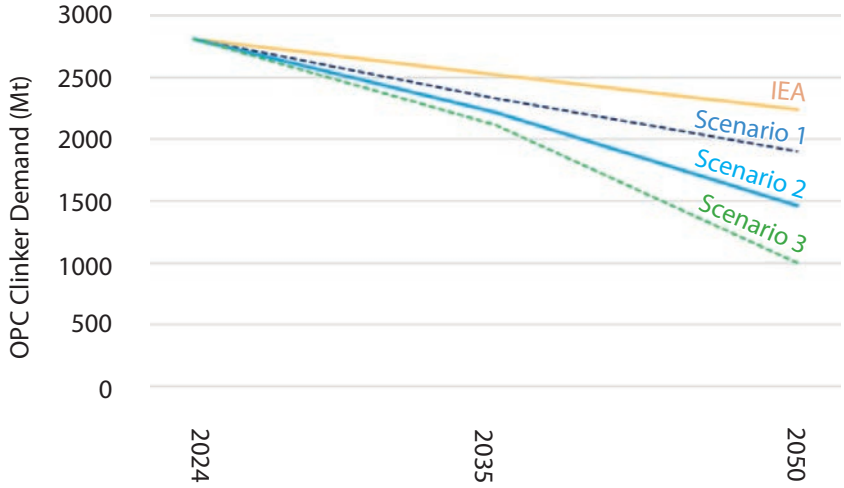


Figure 2: IEA and WCA clinker demand forecasts, taking into account falling clinker factor.

The effect on CO_2 emissions

Clinker production is the main source of cement industry CO_2 emissions. Today, around one third of emissions come from burning fuel and two thirds are from the decomposition of limestone. As the cement industry moves from coal to lower-CO_2 fuels like post-consumer-derived fuels and biomass, the fuel emissions per tonne of clinker will be reduced. WCA anticipates that the industry average specific fuel emissions will reduce by nearly 70% by 2050. Accordingly, the projected gross CO_2 emissions from cement production before CCS are forecast to fall from 2.4Bnt in 2024 to less that 1.0Bnt in 2050.

Conclusions

The cement industry faces changes on a scale it has not seen in the past and no forecast can be considered definitive. However, what is clear is that demand for cement - and clinker in particular - will decline substantially. The decline of clinker demand to perhaps half of current levels is a huge challenge for the cement industry. Most of the capital invested in cement plants is in the kiln systems to produce clinker. Global capacity utilisation is currently ~65%. Taking account of expansions that are already being considered, we can expect at least 500Mt/yr of new capacity to come online, mostly in emerging markets. In Scenario 2, kiln utilisation could be as low as 30% by 2050.

These changes also present a big opportunity. Concrete is used in huge quantities because it is an excellent, long-lasting material - and cheap too. The future offers the prospect of greater customisation not only to reduce embodied carbon but also to tailor concretes to the requirements of individual applications. This is a future in which the most agile and forward-looking companies will prosper.

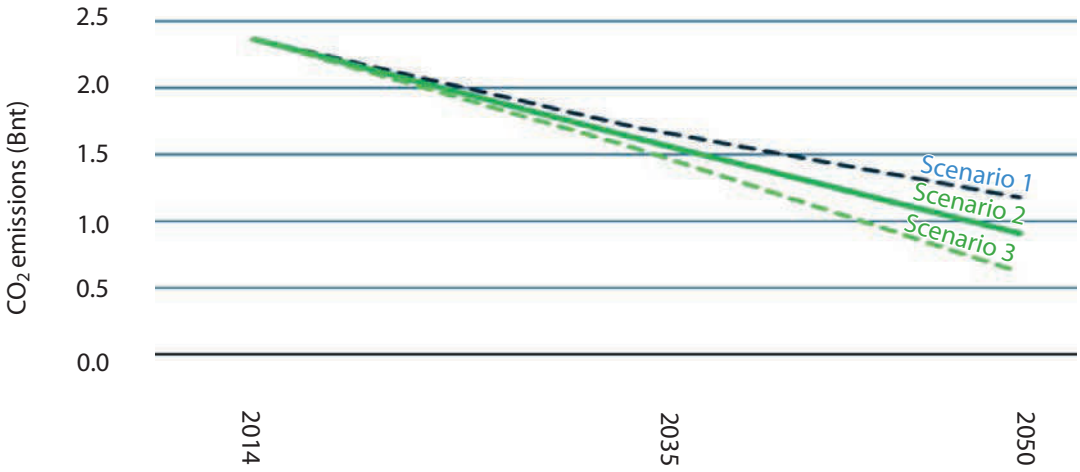


Figure 3: Potential CO_2 emissions from cement (before CCS), taking into account falling clinker factor.

Dr Joe Harder, OneStone Consulting Ltd

CALCINED CLAY PROSPECTS 2035

OneStone Consulting's Joe Harder looks into the future of calcined clay cement production.

Limestone calcined clay cement is a promising alternative to ordinary Portland cement. It offers one of the best solutions for creating value and reducing CO_2 emissions from the cement industry. However, only about 2.1Mt of calcined clay was produced worldwide in 2023. This is less than 0.1% of all cement constituents, including all supplementary cementitious materials (SCMs). The International Energy Agency (IEA) has projected in a technology roadmap a possible increase to 8% of global cement demand by 2050, corresponding to about 375Mt/yr.

This prompts some key questions. How can the production of calcined clay be increased significantly? What are the main benefits for producers and what are the main market barriers? Can the 8% goal be achieved?

Answers to these questions are provided in a new market report from OneStone Consulting.[1] This independent market analysis is a blueprint for companies that want to invest in this market. A selection of key findings are presented in this article.

LC3 cements and technology

Limestone calcined clay cement (LC3) is a family of cements based on a blend of limestone, calcined clay, gypsum and clinker. The LC3 blend shown in Figure 1 is LC3-50, where the '50' stands for the percentage of clinker.[2]

LC3 cements emit up to 43% less CO_2 emissions than conventional cements. Their production, using abundant low-grade clays, is cost effective and does not require capital intensive modifications to existing cement plants.

LC3 cements have very similar compressive strength development trends when compared to Portland cements (Figure 2). Their development is also very similar to fly ash (FA) cements or binary and ternary slag cements that are based on 50%

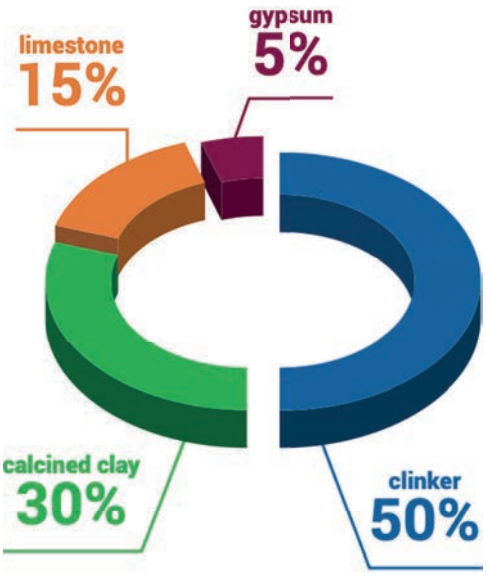


Figure 1: Composition of LC3 cement. **Credit:** EPFL.

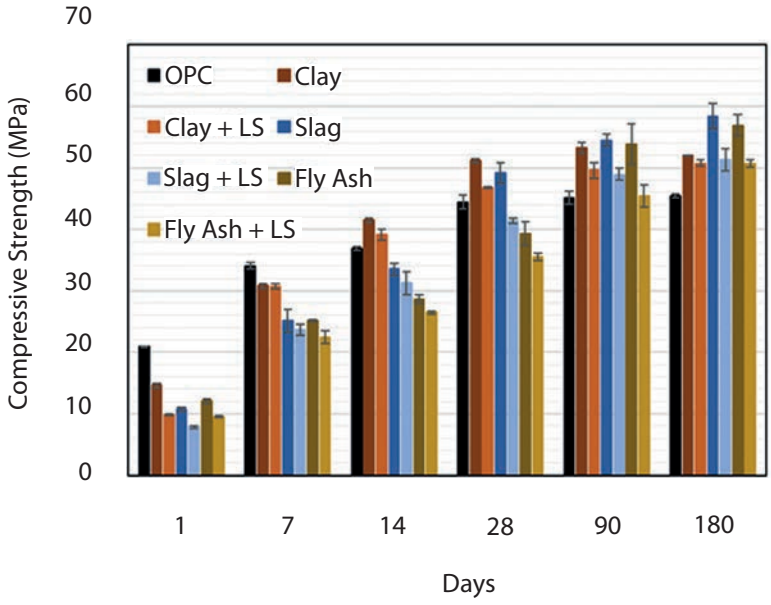


Figure 2: Strength development of LC_3 cement. **Credit:** EPFL.

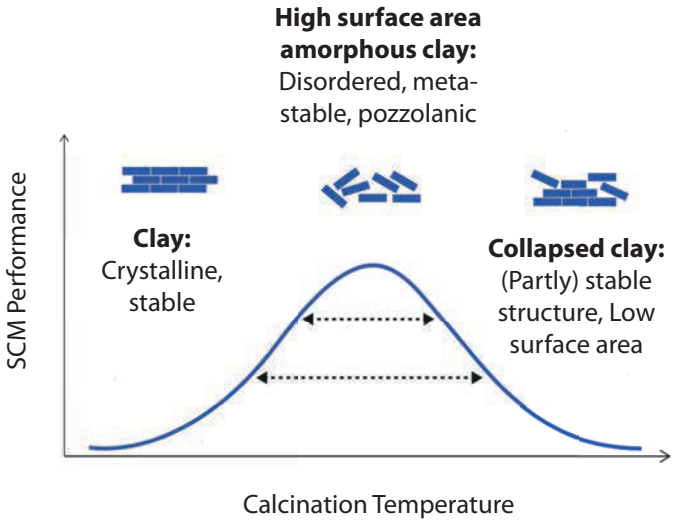
Dr Joe Harder is Managing Director of OneStone Consulting, based in Varna, Bulgaria. He is known for his independent multi-client market reports and nearly 200 market reviews and publications in construction materials magazines.

clinker, 30% SCMs and 15% limestone (LS). The standardisation for these kind of cements is now included in the EN 197-5 (2021), ASTM C695 and ASTM C618.

The production of calcined clay is already well advanced. Thermal calcination can be carried out in a rotary kiln or flash calciner, with electrical technology also approaching maturity. Rotary kilns and flash calciners are well known to the cement industry, with more than 10 different suppliers on the market.

Clay calcination requires only about 60% of the energy that is needed for clinker production. However, the temperature range needed is more precise and optimal residence time is crucial (Figure 3). Drying and preparation of the raw clay are also important.

Figure 3: Temperature range in clay calcination. **Credit:** FLSmidth.



Existing calcined clay production plants

In its new market report, OneStone Consulting found that a total of just 14 clay calcination plants were operational worldwide in 2023. Most were in Latin America, followed by Western Europe and Africa. The combined capacity of these plants was just 3.45Mt/yr and the average capacity was 795t/day. Only 2.1Mt of calcined clay was produced in 2023, which results in a capacity utilisation rate of 60.9%.

The majority (12) of existing calcined clay plants use rotary kilns, while two use a flash calciner. A number of the rotary kilns have been repurposed from clinker production.

The economies of scale of cement kilns and clay calcination kilns are very different. Clinker lines are now being built with capacities of 4500-10,000t/day or even larger, and the average installed kiln is ~4000t/day. It is clear that calcined clay plant sizes must increase if calcined clay cements are to become widespread. This is technically possible, subject to restrictions around the narrow temperature range and residence time. An additional limit is the smaller capacities of clay quarries relative to limestone quarries.

Figure 4: Ciplan's Sobradinho cement plant in Brazil. **Credit:** Ciplan /Vicat.

Figure 5: Cementos Argos' Rioclaro plant is home to the world's largest calcined clay facility. **Credit:** Cementos Argos.

Figure 6: Cimpor's Kribi plant in Cameroon. **Credit:** Cimpor.

Notable calcined clay plants

The Sobradinho clay calcination plant (Figure 4) operated in Brazil by Ciplan (Vicat), processes a high-quality kaolinitic clay with 25% moisture. The rotary kiln has a nominal capacity of 550t/day and now reaches 700t/day. Operational since 2009, the kiln uses petcoke as fuel. The specific energy consumption is about 550kCal/kg.

The Rioclaro clay calcination kiln (Figure 5) operated by Cementos Argos in Colombia has been operational since 2020. It is the largest rotary calciner in an existing kiln line, with a nominal capacity of 1500t/day (0.45Mt/yr). Petcoke and pulverised coal are used as fuel and the specific energy consumption is 570kCal/kg.

The world's first greenfield flash clay calciner was commissioned at Cimpor's Kribi plant (Figure 6) in Cameroon in 2023. The plant has a capacity of 720t/day, although optimisation of the throughput and specific energy consumption are still an ongoing process. The plant uses natural gas and has a calcined clay cement production capacity of 2400t/day.

In 2025, the largest clay calcination facilities on order are 1280t/day for flash technology and 1600t/day for rotary kilns. While OneStone Consulting expects larger sizes in the future, it must be remembered that maximum sizes will be limited due to technical and economic reasons. Calcined clay plants will not achieve the kiln sizes that are routinely seen in clinker processing.

Calcined clay production outlook

Figure 7 shows OneStone Consulting's projection for calcined clay production facilities by the year 2035. According to the identified projects and company announcements, the number of clay calcination plants will increase from 14 units to 56 units in 2030 and then to 79 units by 2035. The calcination capacity will increase to 14.6Mt/yr in 2030 and to 20.8Mt/yr by 2035.

Correspondingly, the average kiln capacity will increase to 839t/day by 2030 and to 859t/day by 2035. The reason for the slight increase in capacities is that there are still plants projected with low capacities of 350-450t/day. Another factor is that many existing rotary kilns will have been converted from clinker production. This means that many of the clay quarries close to those plants will be relatively small. Due to the unknown market acceptance, it is uncertain

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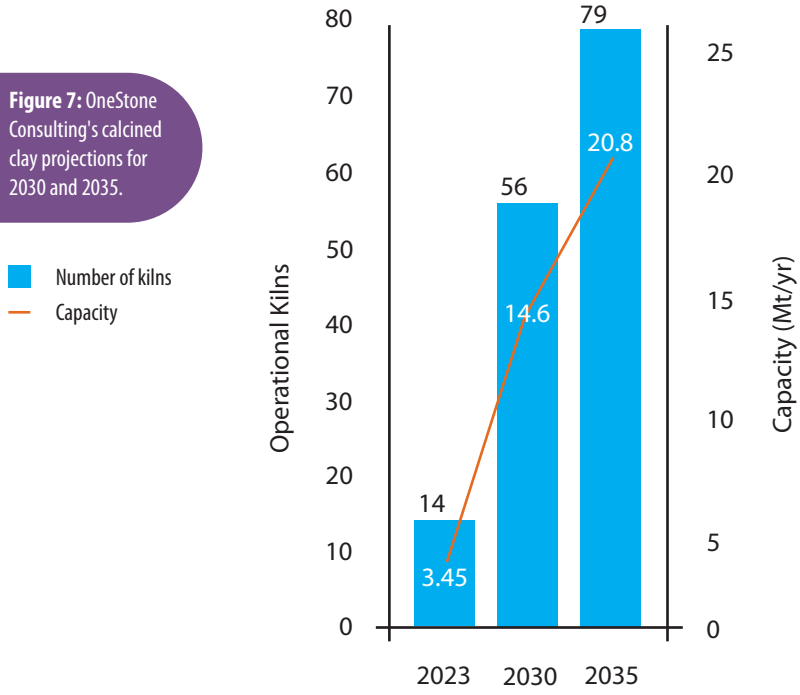

Figure 7: OneStone Consulting's calcined clay projections for 2030 and 2035.

what the future capacity utilisation rates of the new plants will be. OneStone's projection is for a slight increase by 2035, but with rates staying below 67%.

The IEA estimated in its Roadmap 2050 that the world would consume 4.68Bnt/yr of cement in 2050 under its 2 Degree Scenario. Of this, 8% is expected to be calcined clay. This corresponds to a need for ~375Mt/yr of calcined clay capacity.[3] The projected clinker to cement ratio is 60%, which means that 2.81Bnt/yr of clinker and 1.87Bnt/yr of other constituents will be required.

According to OneStone Consulting's projection, cement production in 2050 will be closer to 3.85Bnt/yr, with a clinker factor of 67-68% (2.60Bnt/yr of clinker). Even with a 3% calcined clay share by 2050, about 350 more clay calcination plants with 1200t/day average capacity and 75% capacity utilisation will be needed after 2035. Over the 15 years between 2035 and 2050 this corresponds to 21-25 new plants per year.

Prospects and barriers

Today, the main market barriers are the installation costs for clay calcination units, concerns over the compressive strengths of clay-containing cements, a lack of funding schemes, limited knowledge of LC3 cement and elongated procedures for obtaining mining rights. The exact order of importance for each parameter varies by country and region.

In any case, the advantages for producers are much more significant. With calcined clay, cement producers can reduce their CO_2 footprint by reducing their clinker production. Indeed, a higher percentage of calcined clay can be blended with clinker than for other SCMs. In some locations it may be less expensive to produce calcined clay than to purchase (imported) fly ash or GBFS.

However, reducing the clinker factor by using calcined clay requires a change in policies. Governments should encourage the production of calcined clay and the supply and use of LC3 cements. This includes tax credits for the production of LC3 as well as accelerated depreciation schemes for calcined clay investments, LC3 facilities and equipment so that producers can reduce their taxable income and tax liabilities to enhance short-term cash flow.

There are a few examples of funding clay calcination projects in the US and Africa. In Europe, up to now, not much funding for clay calcination has been received, although billons of Euros were previously announced by the EU Innovation Fund for carbon capture projects. Only a few loans have so far been given to clay calcination projects, including in France, Germany and the Czech Republic.

Summary

The reduction of the clinker factor in cement production by using calcined clay is a viable option in the quest for more sustainable cement production.[5] However, in 2023 only 2.1Mt/yr of calcined clay was produced, which corresponds to only 0.052% of cement produced in that year. OneStone projects that, based on its numbers presented above, this will increase to just 0.36% in 2035. As shown by pioneering projects, the technical barriers are relatively low. The future adoption of calcined clay cements, including LC3 cements, will largely depend on the acceptance of these by governments, funding agencies, equipment suppliers and the public.

Much more information on this topic can be found in OneStone Consulting's new market report: Calcined Clay Market Outlook 2035 (CCMO 2035), Multi-client market report by OneStone Consulting Ltd., December 2024, Varna, Bulgaria.

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Interview by Peter Edwards, Global Cement Magazine

LEADERS SERIES: CIMENTERIE NATIONALE

Jalil Michel Darzi, COO of Cimenterie Nationale, Lebanon, talks to *Global Cement* about his company's achievements and his hopes for the future of the cement industry.

***Global Cement (GC):* What was your first experience of working in the global cement sector?**

Jalil Michel Darzi (JMD): My first experience working for Cimenterie Nationale (CN) was in 1986 with the preparation of the geological framework for long term quarrying, in which bore holes were executed and analysed by SST, a specialised German mining, geology and survey company. Each zone and layer of our main and secondary quarries were defined in terms of location, composition of the raw material and quantities, in addition to the suggested exploita-

The kiln of the Cimenterie Nationale plant. **Source:** Cimenterie Nationale.

tion and rehabilitation method. This first experience was crucial for understanding the pyroprocess, encompassing a range of engineering and management challenges, solutions, and improvements. It defines the domain that is the scope of work for engineers and future engineering managers.

Over the past 31 years at CN, my journey has been defined by teamwork, dedication, and a strong passion for problem-solving and continuous improvement. Throughout this time, I gained an in-depth knowledge of our industry, stakeholders and company.

***GC:* What is the best part of your role?**

JMD: After 10 years of dedicated service, my responsibilities were expanded to include overseeing the power generation department, along with my operations and maintenance duties. This role involved resource management, planning upgrades, conducting reserve mapping and borehole studies, upgrading port infrastructure, and maintaining market share, while fostering sustainable stakeholder partnerships.

Over the past five years, I progressed to Co-COO and then COO, managing the plant's operations and maintenance. I also focused on improvement projects and energy management, particularly in response to the challenges posed by the collapse of governmental institutions and stringent environmental regulations put in place in 2019. We aligned our practices with the emissions and quarrying standards set by the Ministries of Environment and Industry, operating under an integrated management system audited annually by VDZ Germany.

***GC:* Which of your company's achievements are you most proud of?**

JMD: Many of the milestones we have achieved were both interesting and challenging, and I'm proud of every achievement we have made. These include our quarry and plant undergoing significant upgrades during the period of 1993 to 2006, enhancing production capabilities and modernising equipment, particularly in quarry crushers, earth-moving machinery, and cement processes. This positioned us as a market leader in both bulk and bagged cement.

In 2009, we initiated an energy management program with the Confederation of Indian Industry. This identified 62 projects, with an aim to achieve ISO 50001 certification within 2-3 years. We also engaged experts for geological mapping of our quarries and borehole assessments to guide material selection and develop exploitation and rehabilitation plans.

Over the past five years, we have collaborated with various stakeholders to finalise emissions and quarrying regulations, establishing strict standards for emissions and comprehensive end-of-life plans for quarries.

To ensure compliance, we are installing advanced monitoring equipment. Despite challenges in the Lebanese cement industry, we are targeting near net-zero emissions through efficiency optimisation and waste heat recovery projects. However, progress is hindered by the need for governmental support, including a dedicated law for long-term quarrying permits and expedited refuse-derived fuel production from municipal solid waste. We also advocate for increasing limestone or additive content in cement to meet European standards.

***GC:* What is the biggest threat to the global cement industry as we know it?**

JMD: The global cement industry faces its biggest challenge from climate change, with stricter regulations and a growing demand for sustainable practices already reshaping our operations and cement production. To invest in 'green' initiatives and reduce CO_2 emissions, companies need clarity on future concrete demand, aiming for near-zero and net-zero emissions aligned with the Paris Agreement and the Global Cement & Concrete Association (GCCA)'s roadmap.

According to the GCCA's October 2024 CEO briefing, there are industries exploring the Green Market Concrete (GMA) concept, emphasising

innovation and particularly the initiative to 'take clinker out of concrete.' This development requires careful analysis by the GCCA, as it could significantly influence the industry's future viability.

***GC:* What would you like to change about the cement industry?**

JMD: I would like to see a greater emphasis on circular economy principles, focusing on recycling materials and reducing waste. Every cement company recognises the importance of a decarbonisation roadmap, however, the targets should be reassessed to ensure that they are realistically attainable. The GCCA needs to establish a common framework that encompasses diverse strategies, from energy management to alternative fuels and clinker ratio, with carbon capture being the final step.

Standardising key performance indicators within the GCCA would also enhance collaboration, leading to improved data collection and a more effective 'Getting the Numbers Right' (GNR) database, which provides comprehensive data on the cement industry's CO_2 emissions and energy performance. My focus is on making the cement industry more sustainable by transitioning efficiently to low-carbon materials and processes.

As noted by a colleague at KHD, decarbonisation in the cement industry must leverage digitisation to effectively reduce CO_2 emissions. With approximately 850kg of CO_2 emitted per tonne of clinker produced, achieving decarbonisation requires digitisation, innovative processes and energy concepts, as well as the development of new cement types. However, we must also combine this with established knowledge in traditional processes, chemistry and mineralogy to advance towards net-zero emissions.

***GC:* How will AI change the cement sector?**

JMD: AI integration in the cement and concrete sector is poised to enhance efficiency, sustainability and innovation, contributing to a more resilient built environment. By facilitating rapid decarbonisation, AI optimises cost and quality while providing advanced solutions for predictive operations, maintenance and environmental management.

The key benefits of AI in this sector include the development of optimised mix designs that enhance strength and sustainability, predictive maintenance to reduce downtime, real-time quality control, improved supply chain efficiency and the promotion of more sustainable alternatives. Additionally, AI aids in construction site management and accelerates research and development, ultimately leading to better durability analysis and infrastructure planning.

***GC:* What other emerging factors will affect our industry in the future?**

JMD: Emerging factors affecting our industry include advancements in sustainable materials, evolving building and environmental regulations, and shifts in consumer preferences toward more sustainable construction practices. These developments have become the focal points in cement industry webinars and conferences.

***GC:* How do you expect markets for cement to change in the future?**

JMD: I expect markets in developing countries, particularly in Asia and Africa, to grow significantly due to urbanisation and infrastructure development. However, established markets will also evolve with a focus on sustainability.

***GC:* How can cement producers differentiate themselves from their competitors?**

JMD: Cement producers can differentiate themselves through innovation in sustainable practices, such as using basic energy management, considering alternative raw materials and fuels, and investing in carbon capture technology, while also enhancing customer service and product quality.

***GC:* Where will be the most important cement market in 2050?**

JMD: I believe India will be one of the most important cement markets by 2050, driven by its rapid urbanisation and infrastructure projects, while evolving in its use of sustainable concrete.

***GC:* What advice would you give to your younger self?**

JMD: The industry is evolving toward more sustainable and technologically advanced practices, so I would tell myself to focus on sustainability and innovation, and the environmental impact of traditional practices. I would seek out emerging technologies, like AI and alternative materials, that can improve efficiency and reduce CO_2 emissions. It is invaluable to build a strong foundation in data analysis and engineering principles, as the industry relies increasingly on smart technologies, and I would network with professionals and engage in continuous learning that opens doors to opportunities. Above all, I would tell the younger me to be adaptable and to embrace change!

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SINCE 1996 INNOVATIONS MADE IN GERMANY

Interview by Jacob Winskell, Global Cement Magazine

ABB: NEW CEMENT DECARBONISATION PARTNERSHIPS

ABB has long partnered with the global cement industry to help increase process efficiency and reduce CO_2 emissions through automation, digitalisation and electrification. New collaborations with start-ups are further transforming that value proposition.

***Global Cement (GC):* How does the cement sector feature in ABB's operations?**

Michael Marti (MM): Cement holds a lot of opportunities for ABB. It is one of our growth industries, alongside the battery sector, data centres and the supply of high-power rectifiers to the metals and hydrogen sectors. These are industries that we expect will make significant investments up to 2030. Our reason for including cement is anticipated developments in the decarbonisation space. Producers are already putting together and implementing large-scale spending plans, which will start to bear fruit in the next 10 years. There are many areas where we can come in: besides the electrification of heating, cement production is also rapidly automating, partly due to pressures for productivity, cost reduction and quality, and partly in order to decarbonise.

Medcem Çimento's Mersin cement plant. **Source:** ABB.

***GC:* Where is ABB's cement division active?**

MM: ABB operates a cement division which serves cement customers anywhere. However, we do have two hotspots. One is India, where we see a lot of investment in new plant builds. As such, we maintain a big footprint there in terms of engineering capabilities and centres of expertise. The other is Türkiye. As well as being a strong market, it also serves as a base from which to execute projects in other countries, through our more front-end sales-focused teams.

Another team is based in China, which is important by virtue of its scale. There is overcapacity there, and a lot of engineering, procurement and construction (EPC) contractors are looking for more overseas work. I was recently at an event that pulled together ABB's end customers, EPC contractors, system integrators and channel partners. Many said that the Chinese market is difficult right now – some even talked about moving into other industries besides

Michael Marti is Global Business Line Manager – Growth Industries at Switzerland-based ABB. His remit includes ABB's supply of automation and electrification technologies to the global cement industry. He has held several Vice Presidential positions in the group, including as Global Head of Marketing and Sales – Process Industries; Metals and Mining Industry Network Leader; Global Account Executive and Head of Original Equipment Manufacturers North America. Marti previously worked for engineering firm Siemens. He holds a PhD in Business Administration and Management from the University of St. Gallen, Switzerland, and a Master's in Mechanical Engineering from the Federal Institute of Technology Zurich (ETH Zürich), also in Switzerland.

cement. I'm slightly pessimistic about the domestic market in the medium-term future, as it will take at least a couple of years for demand to catch up with the massive capacity that producers have built up. We have to maintain our close relationships with them, however, as a lot of decision-making takes place in China for projects elsewhere, including Africa and the Middle East.

Lastly, the greatest action on the decarbonisation side is in Europe and North America. Our operations there are less back-end execution, more sales and business development.

***GC:* What recent deals have affected the cement sector?**

MM: Typically, our deals in the cement sector are in the US$1 – 5m range. In October 2024, ABB won a contract with Lafarge Canada to upgrade process control systems at its Bath cement plant in Ontario, Canada. This deal involves commissioning and supporting a new ABB Ability 800xA distributed control system to give Lafarge Canada visibility and control over processes at the plant.

We have also entered into a series of 'multiplier' partnerships with suppliers of decarbonisation products to the cement industry, namely Captimise, Coolbrook, SaltX and Carbon Re. Together, they represent a package of technologies currently needed in this space. As a large technology company, we can multiply their standalone value proposition – and vice versa for us. This involves taking on a bit of entrepreneurial risk.

Captimise is a Sweden-based engineering company in the carbon capture space, working with industries, including cement, on a technology still in its first stages. We are working with them to supply automation and electrification for future projects.

On the electrification side, meanwhile, are Coolbrook and SaltX Technology. Finland-based Coolbrook developed the RotoDynamic heater (RDH) for cement and steel production, which is still being tested. The RDH uses process heat to replace burning fossil fuels by means of an embedded turbine which heats up air. We can provide the motor, electrics and automation systems.

SaltX Technology, based in Sweden, is developing a technology called the electric arc calciner (EAC), which also changes the cement production process to use heat from electricity. It also captures CO_2 for storage, without having to treat it. Having gone through due diligence, we launched a partnership with what we feel is a strong proposition.

All this is brought together by UK-based Carbon Re's AI and machine learning technologies. Our partnership follows a successful pilot together at a cement plant in the Czech Republic, where ABB plans to augment its Ability Expert Optimiser process control system with Carbon Re's AI platform. This integration should automate and optimise plant conditions, reducing specific energy consumption by 5% and facilitating a 50% increase in the alternative fuel (AF) substitution rate.

***GC:* What automation and digitisation options are there with an ABB process control system?**

MM: Our automation platform, System 800xA, runs the cement production process – which is amazing

to see in action. It means that a given plant's people-footprint can be very limited, for instance running over the weekend on a shift of just two people.

Working on top of that are our digital solutions, like our Expert Optimiser advanced process control (APC) software. It optimises the process and learns, removing the need for manual interventions by very experienced operators. Instead, the system can operate at the desired set point with only very small variances. The resulting efficiency gain is typically of a few percentage points, depending on site and conditions. The Expert Optimiser is based on an established operating system, which can integrate any input variables, for example additional measurement devices on equipment. It is very modular and can be updated at any time. Something like Coolbrook's RDH, for instance, would be a far more substantial change to the process, but that is part of what our platform can do.

A third part of our offering is our Knowledge Manager system, which makes information transparent. One of the big cement producers uses it to see production levels and key performance indicators for each of their units globally, on one centralised interface. The plants also 'talk to' each other.

***GC:* What is the outlook for electric heat?**

MM: The potential is vast, but the adoption curve will take time. We are looking to get a pilot out there and prove the return on investment. I think in 1-3 years we will see this picking up.

On the development side, Coolbrook has reached 900°C, on the way to its ultimate goal of 1700°C, so that limits the applications we can currently cover. We can prove ourselves first in lower-temperature applications, then move stepwise to cement.

***GC:* How can the cement industry meet its commitments on emissions reduction?**

MM: What matters now is that the industry moves swiftly in the right direction. That way, even if interim targets are missed, investments will be in place. We see partnerships like our multipliers making a substantial contribution.

Currently, there is the strongest drive in Europe first and North America second. I recently visited a customer's cement plant in Türkiye that also exports to these markets. Local legislation doesn't require it to reduce its CO_2 emissions, but it is anyway.

Carbon capture will be another huge piece of the decarbonisation puzzle. Heidelberg Materials has fitted the largest of these, at its Brevik plant in Norway. Even there, the project manager said that they would not necessarily go about it the same way again, because it was such a big challenge. Everybody is still going through the lessons from there. We remain positive, even if it will take years.

***GC:* What areas present the main challenges to cement decarbonisation?**

MM: Regulatory frameworks, which are lacking, and technology readiness, which is uncertain. Our partners say they are ready, but these technologies still need to be proved in the everyday production life of a cement plant. And there is also a certain conservatism on the part of the industry.

***GC:* How can governments ensure these investment decisions are taken?**

MM: Uncertainty is the worst thing for getting investment decisions to happen. When market requirements shift, as with decarbonisation, there must be a clear regulatory framework setting out the boundary conditions: emissions reductions targets and dates. With a clear roadmap, players can start investing.

If companies have the right incentives then they have to change, no matter how conservative they may be.

***GC:* What would be your ideal next partnership for cement?**

MM: The decarbonisation space is definitely our search area for partners. It is where we see the investment focus of all the industry players. I imagine something which would enhance our current portfolio, although we have a fairly strong positioning, so that is a secondary concern.

Until very recently, companies – us included – had mostly been doing 'our own thing.' ABB's efforts to be a significant player in the decarbonisation of the cement industry need to involve 'outside' players, and this requires a different mindset. It also opens up cross-learning opportunities. Start-ups were formerly something which belonged in the IT space. Suddenly, a lot of bright minds see opportunities to get into cement, and it has gone from not-so-sexy to very interesting. These start-ups are taking new directions, such as combining recycling construction and demolition materials (CDM) and carbon capture, with carbon certificates as an 'end product.' Major multinationals from other industries are paying attention, and becoming investors. None of this would have been possible five years ago.

***GC:* Thanks for talking to us, Michael.**

MM: My pleasure.

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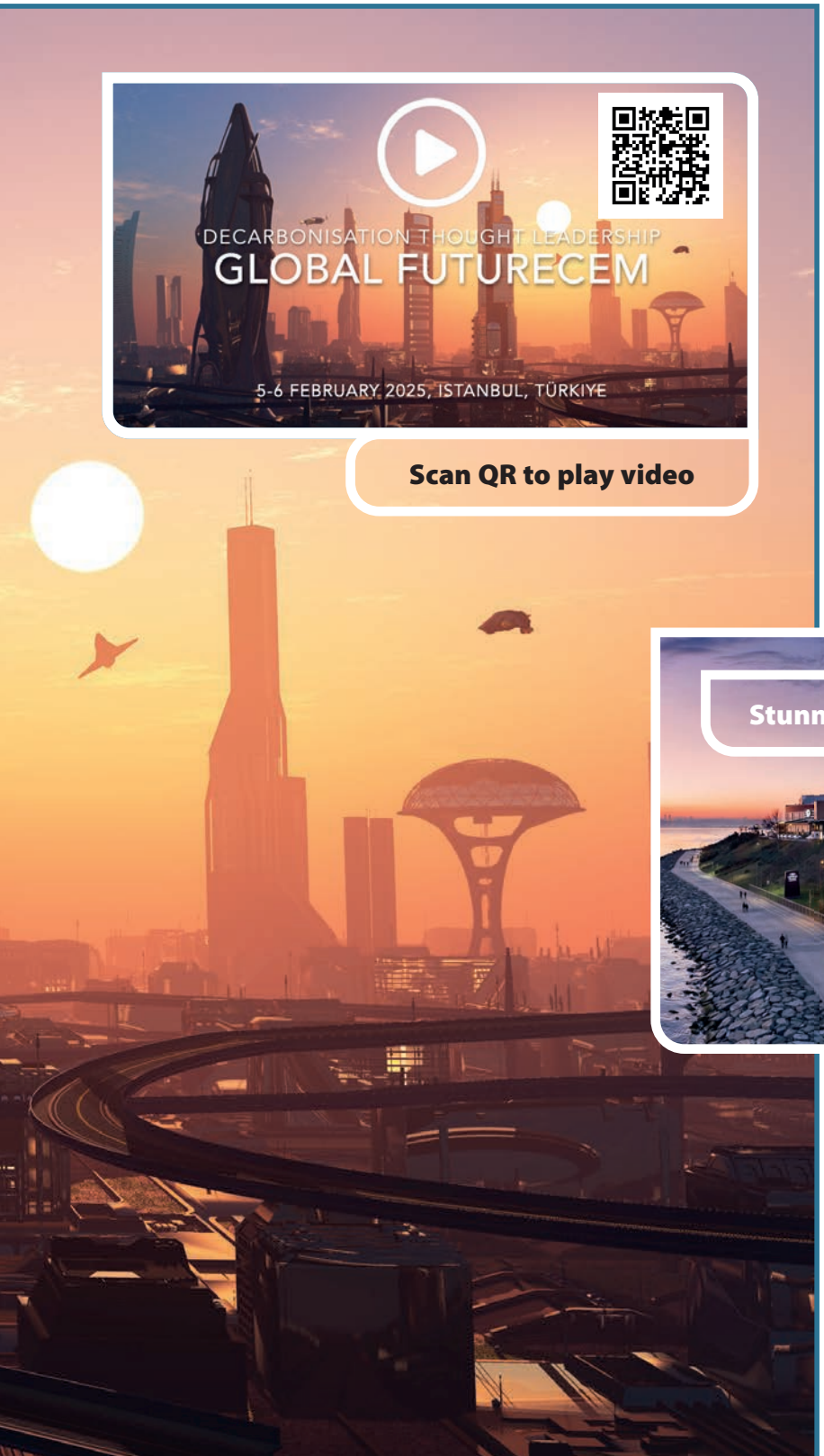

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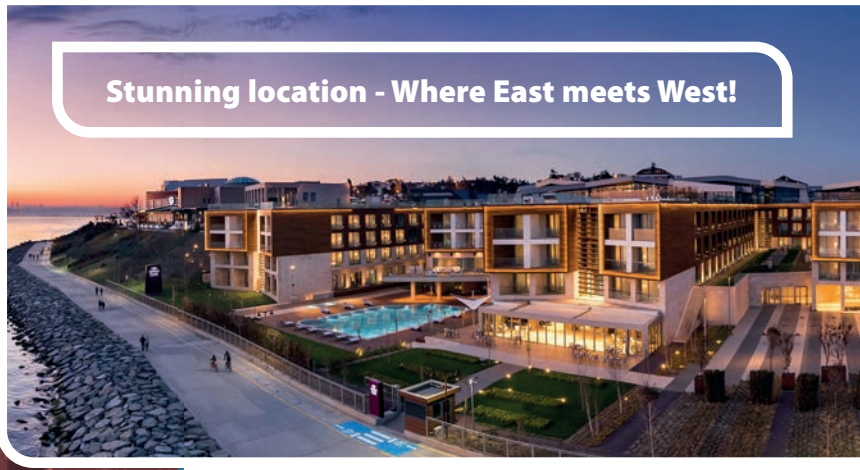

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SUSTAINABILITY THROUGH OPTIMISATION

ASEC looks at how decarbonisation targets can be met through improved operational performance.

There are two main ways to achieve decarbonisation targets in the global cement industry: **1.** Replacing carbon-intensive energy sources with carbon-free alternatives; **2.** Reducing and optimising specific thermal and electrical specific energy consumption.

This article examines two cases from a cement plant where ASEC reduced CO_2 emissions by lowering specific energy consumption. The first case involves a vertical roller mill (VRM) that experienced an increase in power consumption due to system defects and operational issues. The second case focuses on optimising the specific heat consumption of one of the plant's kilns.

Sustainability vision

ASEC's approach to problem solving stems from its responsibility toward the environment and its clients. By focusing on optimisation, it aims to reduce costs while contributing to the production of sustainable cement.

Optimisation involves working within existing system limits to achieve emission reductions. In this way, companies can save on operational costs and minimise the need for large investments in CO_2 reduction technologies.

Figure 1: Defect in top seal.

Investigation strategy

To achieve optimisation, the first step is to identify bottlenecks and key points within each system. Conducting comprehensive audits is essential for evaluating system performance. These assess the operational status of equipment and include both process and mechanical evaluations. Key elements typically involve:

1. False air mapping;

2. Airflow measurements;

3. Gas speed assessments;

4. Heat and mass balances;

5. Cooler efficiency assessments;

6. Radiation assessments;

7. Visual inspections;

8. Mechanical assessment and design reviews.

Case one - VRM

The VRM is a three-roller system designed to produce 355t/hr of raw meal with guaranteed sieve residues of 14% on a 90µm mesh. Over time, its

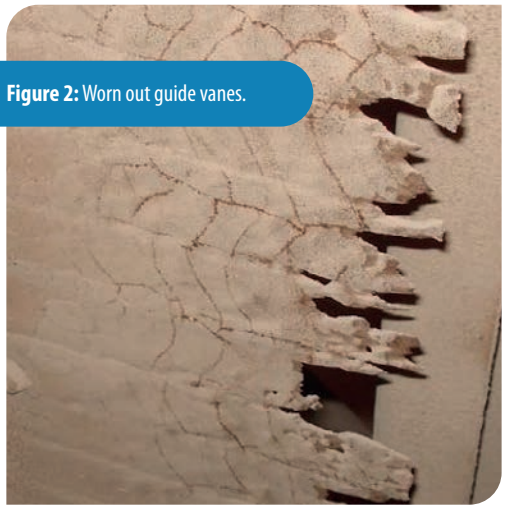

Figure 2: Worn out guide vanes.

performance deteriorated, with productivity declining to just 251t/hr. Frequent stoppages due to excessive vibrations and airlift blockages further compounded the issues. Additionally, the mill's specific power consumption increased significantly from the design value of 15.4kWh/t to 20.5kWh/t, while the product sieve residue rose to 17.7%. It is important to note that the increase in power consumption directly translates to higher electricity usage, resulting in increased CO_2 emissions.

An investigation involving both the process and mechanical teams was conducted by ASEC's Technical Center. A comprehensive audit discovered:

1. The feed material was very fine, with 78% passing a 1mm mesh. The reference states that just 10% of the feed would pass 1mm;

2. High false air in the total mill system, which reached 70%. Best practice requires 17% or less;

3. The air nozzle area of the mill was just 1.86m^2, compared to a designed area of 4m^2. This caused gas velocities to reach 80m/s, compared to a reference of 50m/s;

4. The top seal of the separator (Figure 1) and guide vanes (Figure 2) were worn.

ASEC and the plant improved the feed size of the mill input, closed all false air entry points, enlarged the air nozzle area, adjusted all control valves in the hydraulic circuit, repaired the affected seal and vanes and enlarged the motor pulleys of the three airlift blowers.

These actions resulted in a 24.5% increase in the flow rate of airlift blowers, solved the vibration issue and recovered productivity, as shown in Table 1. For Scope 2 emissions related to specific power consumption, CO_2 emissions were reduced from 37kg CO_2/t of cement to 29kg CO_2/t of cement. This represents a total reduction of approximately 9030t/yr of CO_2, equating to a decrease of 21.6%.

Table 1: Improvement in VRM operating parameters

Parameter	Pre-optimisation	Post-optimisation	Change (%)
Feed rate (t/hr)	251	359	+ 43
Passing 90µm sieve (%)	17.68	14.68	- 17
Specific power consumption (kWh/t)	20.5	15.13	- 26

Case two - The kiln

The kiln in this case is 77m in length and 4.75m in diameter, equipped with a 5-stage preheater, an inline calciner and a modulating cooler. Initially, kiln operation was stable, but performance began to deteriorate, leading to an increase in specific power and heat consumption. ASEC recognised that optimising these parameters would reduce CO_2 emissions. Table 2 compares the kiln's design capacity and its performance before optimisation.

Table 2: Kiln operating parameters before optimisation

Parameter	Design	Operation
Output (t/day)	4500	4040
Thermal energy consumption (kCal/kg clinker)	785	854
Electrical energy consumption (kWh/t clinker)	32	38.5
Free Lime (%)	1.2	2.0
Clinker temperature (°C above ambient)	75	130

The ASEC Technical Center conducted a comprehensive audit, including a detailed heat balance analysis within the system boundary, to pinpoint the source of energy losses. This revealed that the primary losses were from the cooler. Based on this finding, the ASEC team focused on optimising the cooler using a cooler energy balance. This revealed:

1. Cooler losses were around 196kCal/kg of clinker, compared to the reference value of 100kCal/kg;

2. Secondary and tertiary air temperatures were 870°C and 885°C respectively, against a benchmark of >1000°C;

Table 3: Reduction in CO_2 emissions due to kiln improvements			
Parameter	**Pre-optimisation**	**Post-optimisation**	**Change (%)**
Specific CO_2 emissions (kg/t of cement)	260	240	- 8.0
Annual CO_2 savings (t/yr)		24,133	

Figure 3: Material removed from fan flow pathways.

Figure 3: Malfunctions in clinker cooler airflow controllers.

3. The clinker temperature above ambient was 130°C, compared to a reference of 100°C;

4. Cooler efficiency was just 54%, compared to a reference of 70-75%;

5. The absolute airflow of the cooler fans was found to be lower than the design figures.

Visual inspections revealed blockages in the pathways of the cooler fan flow and build-up on the cooler modules, which restricted fan airflow (Figure 3). There were also malfunctions in the airflow controllers inside the cooler (Figure 4).

ASEC and the plant team thoroughly cleaned all fan pathways and cooler modules and adjusted cooler airflow controllers to ensure proper function in the future. These actions increased the airflow of the cooler fans by 5 percentage points to 13%, increased tertiary and secondary air temperatures by 25% to reach 1090°C and 1100°C respectively, and lowered the specific heat consumption per tonne of clinker from 854kCal/kg to 785kCal/kg.

Conclusion

By thoroughly analysing these two case studies, it is clear that optimisation can lead to significant CO_2 reduction. Combined, these two simple maintenance / optimisation projects have reduced CO_2 emissions from the plant by 33,163t/yr, around a 10% improvement in emissions.

It is evident that investing in CO_2 reduction is essential. However, achieving this while maintaining a budget surplus through optimisation is even more advantageous. By working within defined constraints and focusing on operational efficiency, significant cost savings can be achieved. These savings can then be reinvested in additional decarbonisation projects, amplifying the impact.

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HEAT WAVE: CTP TEAM'S WHR REVOLUTION

CTP Team serves the global cement industry with its offering of heat and emissions control technologies. The company is on a growth drive, and the global cement industry is transforming around it, with notable growth in interest in the supplier's largest class of projects: waste heat recovery.

***Global Cement (GC):* Please would you introduce CTP Team?**

Feliciano Spina (FS): CTP Team was founded in Milan in 1970 to supply bag filters and heat exchangers to the cement industry. Bag filters serve to restrict air pollution, while heat exchangers are used in clinker cooler gas conditioning towers to control temperatures coming down from the preheater tower. From around 2000, the company began to introduce gas treatment – NO_x, SO_2, heavy metals and deodorisation systems. We have partners we can work with, depending on the type of technology; desulphurisation we do ourselves.

Today, the core business of CTP Team is waste heat recovery (WHR). This is partly by virtue of the scale of this type of project, which is about four times the size of our air pollution control (APC) contracts.

***GC:* What is CTP Team's production footprint?**

FS: Our parent, CTN Group, used to be a steelworks manufacturer. It has a 40,000m^2 workshop in Adana, Türkiye, equipped with massive cranes. In recent years, it switched over entirely to boiler production. We produce our systems there, receiving raw materials and testing and certifying our equipment entirely in-house.

Heat exchangers move into place at the cooler of Sönmez Çimento's Sönmez cement plant in Türkiye.

Source: CTP Team.

Feliciano Spina became Global Sales Director at Italy-based CTP Team in 2024. He first joined the company as its Chief Operating Officer in 2013, serving until 2017, when he moved to become Sales Director Americas, and subsequently Executive Vice President, at Bedeschi. Spina was Commercial Director of Redecam Group in 2000 – 2013, having previously founded and co-owned ICM and worked for Metso Minerals, where he started out in the mining industry. Spina studied Engineering at the Antonio Badoni Higher Education Institute in Lecco, Italy.

In Italy, we have a dedicated workshop for bag production, and have recently bought a new €3.5m office 3km away from our current one, in Bergamo. The new office also has workshop capabilities, so some operations may move there in future.

***GC:* What led CTP to supply WHR systems to the cement industry?**

FS: We first delivered very successfully on a relatively small contract for WHR for a chemical plant in Belgium, signed in 2012. This led to another WHR contract, including gas treatment, for the glass industry in Belarus in 2014. We started to chase more WHR after that, signing our first in cement in 2017, at the same time as the company was sold to CTN Group.

Our first cement plant WHR project was in Türkiye, and started right before the Covid-19 outbreak. While Italy completely locked down, Türkiye was comparatively open at that time, enabling us to work through our Turkish system and achieve a smooth start-up. Following the relaxation of Covid-19 restrictions, we started taking new cement WHR contracts again in 2021.

We install our cement WHR systems on the clinker cooler side, bypassing the heat exchanger and going into a boiler to generate energy with a turbine there. We use an organic Rankine cycle with diathermic oil and another fluid that produces the flow. We retain both the boiler and a heat exchanger. That way, if the boiler isn't working or requires maintenance, the operator can bypass it through the heat exchanger and continue to cool the gases before they enter the bag filter or precipitator.

***GC:* Why does CTP Team favour oil turbines over steam for cement plant WHR systems?**

FS: Oil offers the highest possible efficiency. If a plant has a thermal capacity of 40MW from the clinker cooler, the process of making steam and generating energy would typically have a gross efficiency of around 10%, compared to 25% with oil. A second reason is temperature availability: a clinker cooler or pre-heater tower doesn't generally offer temperatures over 400°C, limiting its suitability for steam. This is not the case in other industries, like chemicals and steel, where we install boilers at plants to power carbon capture and for other purposes.

At a 9000t/day cement plant in Türkiye where we are installing a WHR system, we are almost able to take out 10MW from the clinker cooler alone, which is enough to cover 25% of the entire energy consumption of that plant.

***GC:* How does CTP Team go about executing a WHR project at a cement plant?**

FS: All our cement WHR contracts since 2022 have been engineering, procurement and construction (EPC), which entails a lot of preparation, a lot of knowledge and possibly even mistakes. The problems are never with equipment, but with execution. Errors big or small can put things behind schedule, which can escalate in terms of time and increase fees due to contractors. You learn especially quickly from your mistakes when you are fully responsible. One major challenge can simply be fitting these huge pieces of equipment in at the site, where we are effectively building a brownfield plant.

CTP Team has recently appointed a new management team, which I have been part of since rejoining the company in February 2024, and is continuously hiring new talent. Our employees have an average age of just 30, and there is a culture of pushing forward and enthusiasm for challenging projects.

***GC:* How is the order book looking at the start of 2025?**

FS: In 2024 – 2025, we have 11 references in the cement industry, with five already underway at locations that include Portugal and Türkiye. We ended 2024 by signing a new contract with one group for three WHR systems. For the moment, most of our projects are in Southern Europe. Energy costs are fluctuating country-to-country, but Europe's are among the highest – Türkiye especially.

***GC:* What new markets show promise?**

FS: A couple of companies in Ukraine have asked us if we can help on WHR, and we are already exploring it at a cement plant there. It is a complex environment, but we hope the situation will improve soon. Before they start to recover their full capacity, Ukrainian cement plants will also need an alternative supply of energy.

For as long as I have been in this business, Chinese producers have used steam boilers for WHR. These are installed at hundreds of plants across East Asia. CTP Team can improve their efficiency.

Then there's North America, where we are 99% set on opening a branch. Besides WHR, it is also very promising for APC contracts, as is Latin America. Most of the large engineering companies serving carbon capture projects across various sectors are based in North America. Among them, we have partners for whom we are already producing boilers.

Several major groups have previously found that WHR wouldn't pay back in the Americas, due to the locally cheap coal and nuclear power. Two things may change that: WHR is increasing in efficiency, reducing its cost per megawatt. And, on the other hand, CO_2 reduction is rising up the agenda. One of the most reliable – though admittedly not the most simple – ways to reduce CO_2 is with WHR.

WHR needs to offer a return on investment. One proposal is for certification of the emissions reduction, for governments to pay out on the cost of investment to cement plants. We see enormous potential in the region for us to make plants more energy autonomous, either with WHR or something else we are hoping to launch later this year. This, in turn, would change their negotiations with the power providers.

***GC:* Will these developments stall in the US?**

FS: I was talking to a steel plant client in Texas recently. They said that their state government might open the door to participation in a payback incentive for WHR. If so, other Republican states can be expected to follow: Alabama, Florida, Pennsylvania, Ohio, with all of their cement capacity. This could get very interesting – we will find out soon.

***GC:* How do you envision CTP Team growing its cement plant offering in future?**

FS: We are following different routes. APC is the historical core business for the company, with more than 50 years' experience and a very good technology. It has one of the most efficient systems of cleaning valves, for instance, and we have a lot of references with good clients. Markets which might not quite be ready for WHR are ready for APC and gas treatment. This lends a possible trajectory to our relationships with clients there, as their circumstances evolve.

***GC:* How can collaborations between suppliers along the production process improve the offering for cement plants?**

FS: We are part of the Cement Alliance, a global network of cement technology providers. We are following a couple of projects that came through the Alliance in the APC segment. On the WHR side, we are also approaching some of the major cement producers through the Alliance, which gives us a chance to make a presentation and really go into depth with their technicians.

This is good for us, too, because we do not necessarily go with every prospective plant. We have to know that our partners are serious about WHR before we move ahead to site surveys and speaking with contractors.

***GC:* Thanks for talking to us, Feliciano.**

FS: My pleasure.

Below: An air-cooled condenser at Çimko Çimento's Narlı plant in Türkiye.

Source: CTP Team.

Aumund Fördertechnik GmbH

CALCINED CLAY SOLUTIONS

Supplier of conveying and storage technology solutions Aumund and Holcim teamed up for an electrical calcined clay project on an Aumund Pan Conveyor.

Significant contributions to the decarbonisation of cement production are well underway, including new types of cement which use calcined clay and a smaller proportion of clinker than in traditional cement manufacture. Clay calcination requires lower burning temperatures than clinker production, so the CO_2 footprint of the cement is reduced significantly. Four years ago, Aumund teamed up with Holcim on a project for the electrical calcining of clay on an Aumund Pan Conveyor.

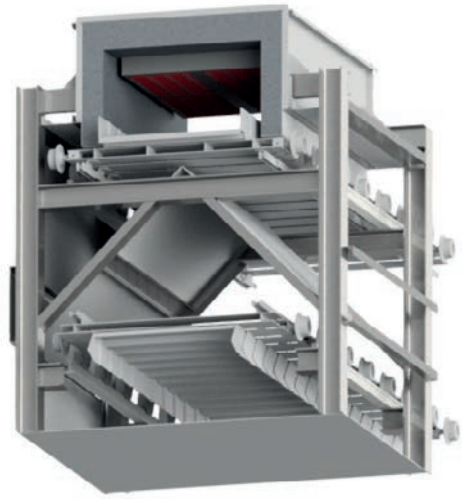
Design and results

The design phase for the electrical Linear Calcination Conveyor (eLCC) culminated in the construction of a demonstration version at the Aumund Fördertechnik headquarters in Rheinberg in Germany. Initial calcination tests were carried out with encouraging results, demonstrating efficient thermal activation of clay through a combination of radiant heat and material circulation.

The eLCC system is fully enclosed and insulated, minimising energy requirements and heat loss, with its compact, modular design allowing for expansion of production capacities. It can operate with electrical heating elements powered by 100% renewable energy sources like wind or solar, making the process carbon neutral. The first industrial plant utilising this technology will be constructed in 2025.

Above: Aumund equipment demo plant.

Below: Aumund eLCC - Linear Calcination Conveyor.



Sick Sensor Intelligence

SICK MONITORING

Accurate, robust, versatile and repeatable – Sick's new compact LXRC and LXRH free-space radar sensors with IO-Link provide one solution for continuous level measurement applications.

Contactless measurement of solids has taken a step forward with Sick's new LXRC and LXRH sensors. Designed specifically for continuous level monitoring and using free-space radar technology, the devices can be used across different sectors and industrial environments, within factory and process automation.

Using frequency modulated continuous wave (FMCW) radar, the LXRC and LXRH sensors can measure levels of bulk materials up to 15m away, with an accuracy of ±2mm, providing easy installation solutions throughout industrial operations.

Solutions for level measurement

As the sensors use contactless FMCW radar technology, both the LXRC and LXRH overcome a range of problems associated with alternative level measurement techniques. Contact measurement technologies can require increased effort to clean tanks and sensors, can sustain damage from abrasive or aggressive materials, and see build up on the sensor probe, which can affect measurement.

In addition, challenges associated with ultrasonic measurement include the effects of variable levels of dust, condensation, steam and temperature affecting readings, and limited 'windows' of usable distance. With free-space radar, all of these problems are eliminated, as there is no contact or dead zones.

Accurate and repeatable

Free-space radar technology can be used in a large range of applications; from measuring silo volumes in cement plants, to water and wastewater treatment, paper pulping and the transfer of aggregates and expensive chemicals around a factory.

Sick's free-space radar sensors offer a solution for level measurement.

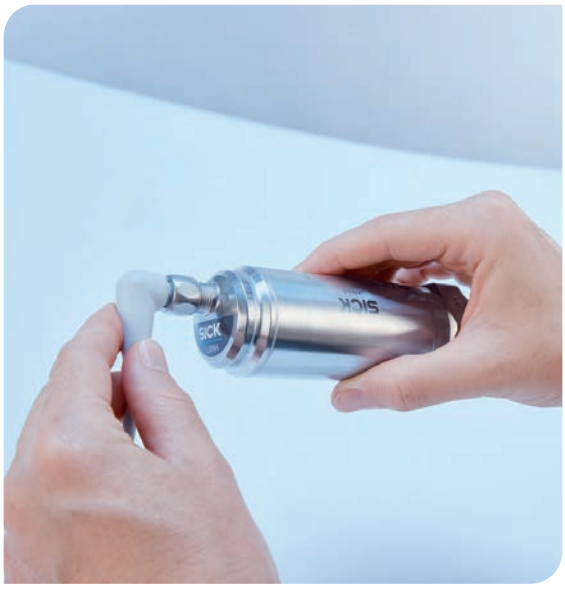
The LXRC and LXRH sensors can be used throughout industrial processes and are easily fitted to a huge variety of machines and containers for the measurement of almost all bulk materials. This means just a single item for inventory and maintenance across an array of process application conditions.

Robust and equipped for the future

Complete with mechanical process connections and communications capabilities, the compact 80GHz LXRC and LXRH free space radar level sensors with IO-Link come with standard analogue and digital outputs and are Industry 4.0 compatible. They are available with optional Bluetooth connectivity for easy commissioning and diagnostics on a tablet or smartphone via the Sick app.

An operating temperature range from -40°C to 130°C and process pressure range from -1 bar to 16bar make the LXRC and LXRH sensors suitable for use in harsh environments. Both devices come complete with eye height status indication and short lead times. Sick's teams work closely with customers to solve their application problems using the company's portfolio of sensing technology.

Nick Hartley, Sick UK's Market Product Manager - Instrumentation & Distance Measurement, said "Sensors are the unsung heroes when it comes to material handling and transfer. The LXRC and LXRH sensors solve a range of industry challenges associated with contact and ultrasonic technology and can be used on almost anything continuously measured and controlled. They perform strongly in harsh environments and throughout multiple operations, providing a single solution to meet many customer needs. We are delighted to offer a hi-tech solution for factory automation that provides high accuracy and repeatability, with commissioning and maintenance reduced to a minimum."



Above: The sensors are easily fitted to a variety of machines and containers.

The technology can be used in a large range of applications across different industries.

Greece: Heracles signs FEED contract with Air Liquide for Olympus CCS project

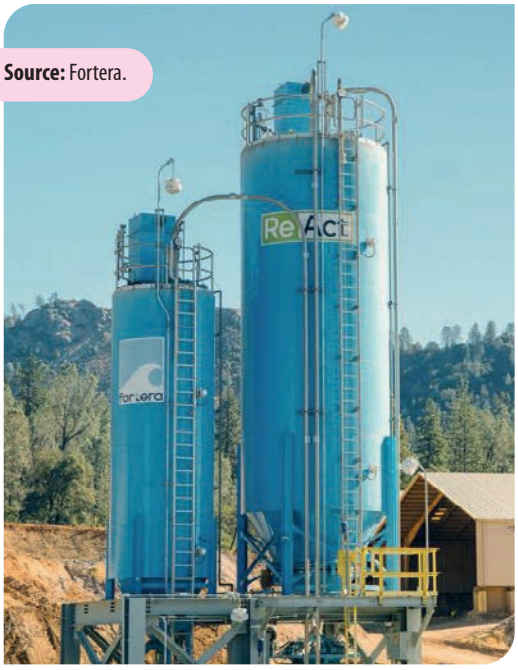
Heracles, part of the Holcim Group, has signed a front-end engineering design contract (FEED) with Air Liquide for CO_2 capture, liquefaction, storage and despatch facilities at the Heracles plant in Milaki, as part of the Olympus carbon capture and storage (CCS) project. The project will enable the plant to capture and store 1Mt/yr of CO_2 and is scheduled for full operation in 2029. The captured CO_2 will be liquefied and transported by sea to the offshore sequestration facility in Prinos in the northern part of the Aegean Sea.

Representatives from Heracles, Holcim and Air Liquide gathered to sign the contract.

India: Start-up develops cement alternative

A Bangalore-based start-up formed at the Indian Institute of Science (IISc) has developed an 'eco-friendly' cement alternative using geopolymer technology. The product claims to reduce CO_2 emissions by 21.5kg/m^2 of pavers produced compared to ordinary Portland cement, according to local press. It also claims to eliminate water use and offer a 15-20% cost advantage.

Nanjunda Rao, one of four co-founders of Novacret and chief research scientist at IISc, said "The benefits are significant, geopolymer-based materials achieve full strength in just three days in tropical climates like India, compared to the 28 days required for Portland cement."



Source: Fortera.

UK/Ireland: New licensing agreement for Hoffmann Green Cement Technologies

France-based Hoffmann Green Cement Technologies has launched a strategic licensing agreement with UK partner Cemblend, furthering its international expansion strategy. The deal builds on an existing partnership established in 2022 for the launch of Hoffmann's 0% clinker cements, with the partners aiming to accelerate the decarbonisation of the construction sectors in the UK and Ireland. Under the terms of the agreement, Hoffmann Green will receive up to €2m in entry fees and annual royalties tied to the sales of Hoffmann cements and premixes. Cemblend will construct production units in the UK to support the rising demand for sustainable building materials.

Japan: Fortera partners with Sumitomo Corporation for low-carbon cement

Fortera is collaborating with Sumitomo Corporation to introduce its ReCarb technology in Asia, starting with Japan. The two companies have signed a memorandum of understanding to deploy Fortera's bolt-on 'low-to-zero-carbon' cement plants across the region, focusing on the largest cement manufacturers.

Fortera's ReCarb process converts industrial CO_2 directly from cement production into cement that is reportedly third-party verified as having 70% less embodied carbon tonne-for-tonne than ordinary Portland cement. When paired with renewable energy, Fortera can achieve zero-CO_2 cement production.

Ryan Gilliam, CEO of Fortera, said "This partnership is a pivotal moment for the future of sustainable cement production, because you can't make a meaningful impact on the industry's carbon emissions without partnering with major industry players in Asia, which is home to the largest cement market in the world."

India: Holcim Costa Rica inaugurates Agua Caliente ready-mix concrete plant

Holcim Costa Rica has inaugurated a new US$650,000, 25m^3/hr ready-mix concrete plant in Agua Caliente, Cartago. Local news reports indicate that the new plant is equipped to produce Dynamax high-performance concrete and ECOCycle 'circular concrete.' The plant will employ 13 people, including Costa Rica's first female concrete mixer truck drivers.

CEO Natalia Soler noted the convenient proximity of the concrete plant to its 1.1Mt/yr Agua Caliente cement plant.

Source: Holcim.

World: Major growth for global concrete market

Market research company Exactitude Consultancy has forecast that the global ready-mix concrete market will increase at a composite annual growth rate (CAGR) of 8.7% between 2024 and 2030. It noted that this will result in a total market value of US$1.54tn. This is more than double its size one decade previously in 2020, of US$725bn.

Saudi Arabia: CarbonCure Technologies partners for reduced-CO_2 concrete production

Canada-based CarbonCure Technologies has partnered with concrete producer Abdin and utilities provider Gulf Cryo to produce new reduced-CO_2 concretes for The Line mixed development in NEOM New City. Under the partnership, Abdin will install CarbonCure Technologies' CO_2 injection systems at its Gayal concrete plant.

Robert Niven, CEO of CarbonCure Technologies, said "By helping lay The Line's foundations with a more sustainable concrete, CarbonCure is proudly demonstrating the enormous potential to significantly reduce embodied carbon of future construction across Saudi Arabia, the Middle East and worldwide."

US: CalPortland Company acquires Grimes Rock

CalPortland Company, through its parent company Taiheiyo Cement, has acquired California-based building materials producer Grimes Rock's ready-mixed concrete and aggregates assets. The assets include one aggregate plant and one ready-mixed concrete plant in Ventura County.

Source: Patio Drummond.

Singapore: Jurong Port RMC complex

Jurong Port (JP) has officially launched its Ready-Mixed Concrete (RMC) Ecosystem, a complex of five ready-mix concrete plants. The RMC Ecosystem integrates 11 aggregates plots and a neighbouring cement terminal at the port. JP is now one step closer to realising its vision of developing Singapore's first Integrated Construction Park (ICP), where construction companies can carry out off-site production in one central location. The ICP will feature the efficient discharge of construction inputs directly into a cluster of downstream construction-related activities, thereby improving productivity, reducing carbon emissions and optimising land use.

Canada: CarbiCrete installs new equipment for Patio Drummond

CarbiCrete has installed new equipment at Patio Drummond's Drummondville plant for the production of concrete using its novel technology, which mineralises captured CO_2 for sequestration inside the product. The company previously entered a new 'financing collaboration' with US-based social media group Meta for installation of equipment at the plant.

Germany: Capsol Technologies to deliver carbon capture project for Holcim

Capsol Technologies has signed a co-operation agreement with Holcim to deliver a CapsolGo carbon capture demonstration campaign at Holcim's Dotternhausen plant in southern Germany. The CapsolGo campaign will test Capsol's carbon capture technology using its hot potassium carbonate (HPC) solvent. Capsol Technologies will provide the demonstration as a turnkey solution, including testing and validation to supply critical data and insight into the technology.

Dieter Schillo, plant manager of Holcim (Süddeutschland), said "The CapsolEoP (End-of-Pipe) unit's design, requiring no external steam supply and exhibiting low energy consumption, makes it an attractive option for our Dotternhausen plant."

If successful, Holcim plans to deploy Capsol's technology across multiple cement plants globally. This builds on a feasibility study conducted by Aggregate Industries UK, a Holcim subsidiary, for the Cauldon cement plant in Stoke-on-Trent. Testing at Dotternhausen will run for four months, starting in the second quarter of 2025.

CapsolGo test facility. **Credit:** Capsol Technologies.

Ukraine/Poland: Ukrcement tries to allay import concerns

Ukrainian cement exports to Poland account for less than 4% of Poland's production, indicating no need for a trade war, according to the Association of Cement Producers in Ukraine (Ukrcement). The association was responding to concerns raised by the Polish Cement Producers Association, which stated that imports of Ukrainian cement into Poland could triple from 0.5Mt in 2024 to 1.5Mt in 2025.

Ukrcement stated that the export of Ukrainian cement to Poland had historically been minimal, accounting for only 0.2-0.3% of Poland's total cement production in 2021, amounting to 53,400t. "Before the full-scale invasion, the export of cement from Ukraine to Poland was symbolic in nature, dictated by the logistics of consumer choice in the border areas," the association said.

However, since the start of the full-scale war, exports to Poland have significantly increased, partly due to a significant reduction in domestic cement consumption in Ukraine, from 10.5Mt in 2021 to 6.1Mt in 2023.

"If we compare the export of cement from Ukraine to Poland during the war with the total production volumes in Poland, we get a figure that does not exceed 4%. Is this indicator such a decisive factor for cement producers in Poland?" Ukrcement asked.

Denmark: New milestone for Greensand CCS project

INEOS has announced the final investment decision to permanently store CO_2 from Danish emitters in the Nini oil field in the Danish North Sea. The company aims to begin operations by late 2025 or early 2026, creating the 'EU's first operational CO_2 storage facility intended to mitigate climate change.'

The project, Greensand Future, will start by storing 400,000t/yr of CO_2, with a potential to scale up to 8Mt/yr by 2030. CO_2 will be captured from Danish biomethane plants, liquified, transported to Esbjerg port and shipped to the Nini oil field for permanent storage. Investments will exceed US$150m to scale storage capacity.

Portugal: Cimpor to invest €1.4bn by 2030

Cimpor plans to invest €1.4bn in its Portuguese cement assets by 2030, focusing on infrastructure, technology and new products to address decarbonisation, described as the 'number one challenge' by CEO Cevat Mert, according to local press.

In October 2024, Cimpor announced an investment of €360m in decarbonisation and innovation projects by 2026, including €180m allocated to its Alhandra plant in Lisbon. The company also aims to expand into more markets beyond the 14 it currently serves. It has invested €50m in a terminal at the port of Bristol in the UK, and also has plans to expand into France and the US. Ignacio Gomez, Cimpor's commercial manager, cited this shift towards Europe and the US due to stricter environmental requirements.

Italy: Increase in cement and clinker imports to and from non-EU countries

Cement and clinker imports from non-EU countries rose by 43% year-on-year in the first nine months of 2024, following 2023's high of 2.28Mt of cement and 1.33Mt of clinker, up by 22.6% on 2022 and 572% compared to 2018, according to Federbeton.

Federbeton president Stefano Gallini said "Italy shares its Mediterranean coastline with countries that, although they boast a large cement manufacturing industry, do not share the stringent environmental and safety standards of EU countries. The increase in imports from these countries therefore risks having repercussions not only on the cement and concrete sector, but on the entire Italian economic and social context."

Gallini warned that Italy faces challenges from cheaper imports driven by lower environmental investments abroad. He added "Federbeton, like the entire hard-to-abate industry, is in a moment of great turmoil, engaged in a path for decarbonisation with investments of €4.2bn in addition to extra operating costs of approximately €1.4bn/yr. Asking the Italian industry for an effort of this type and continuing not to protect it by allowing uncontrolled imports means relocating emissions to foreign countries, to which are added those due to increased transport, with dangerous repercussions for the future of our own planet."

Romania: Fines for price coordination

The Competition Council has fined Holcim Romania, Romcim and Heidelberg Materials Romania a total of €43.7m for allegedly coordinating pricing policies during the period of 2017–2018. Holcim Romania was fined €18.2m, Romcim €13.3m and Heidelberg Materials €12.2m.

The Council found that the companies exchanged non-public commercial information regarding prices, discounts and payment terms through customers, which was used to establish commercial strategies regarding pricing policy. Bogdan Chirițoiu, president of the Competition Council said that "The behaviour led to reduced competition, which generated an increase in cement prices compared to neighbouring countries."

Holcim has since responded, saying that it will appeal the fine imposed and calling the decision 'unfounded' in a recent press release. The company says that it acted in accordance with competition rules.

Latvia/Lithuania: Schwenk secures wind power from Iberdrola

Iberdrola Germany and Schwenk Zement have entered a long-term electricity supply agreement. Schwenk will receive 1500GWh from the Windanker offshore wind farm, currently under construction in the Baltic Sea, for its cement plants in Latvia and Lithuania. This supply will account for about 20% of Schwenk's electricity needs. The wind farm will have 21 turbines, each with a capacity of 15MW, and will cover an area of approximately 17.9 km^2, located 38km northeast of Rügen. The farm will be connected to the grid in 2026.

Sweden: Order for Bruks Siwertell

Bruks Siwertell has received an order for a 10 000 S mobile ship unloader for an undisclosed client. The customer owner will use the unloader as part of a rental ship unloading service, operating across multiple port locations. The order is scheduled for commissioning in spring 2025. It will be delivered fully assembled ready for operation. Jörgen Ojeda, Sales Director, Mobile Unloaders, Bruks Siwertell added that the client had previously used an Siwertell 15 000 S mobile ship unloader for nearly two decades.

Switzerland: Deliveries fall in 2024

Cement deliveries declined by 4.6% year-on-year to 3.6Mt in 2024, impacted by slow economic recovery, uncertainty and high energy prices, according to industry association Cemsuisse. However, the fourth quarter of 2024 showed a 2.1% year-on-year increase in deliveries to 0.89Mt, reportedly driven by declining inflation and low interest rates, with Cemsuisse stating that it is 'cautiously optimistic' about 2025. The proportion of cement types with reduced clinker content rose to almost 97% from just under 96% in 2023. The proportion of cement transported by rail fell slightly to 37.4% from 37.6% in 2023.

Germany: Heidelberg Materials and KHD sign oxyfuel contract

KHD will carry out a front-end engineering design (FEED) study for the new oxyfuel kiln at Heidelberg Materials' Geseke cement plant, part of the GeZero carbon capture and storage (CCS) project. The project will capture and store around 0.7Mt/yr of CO_2.

Spain: Consumption picks up

Cement consumption in Spain recorded an average increase of 1.8% over the first 11 months of 2024, after rising by 4.3% in November 2024, according to Oficemen. The figures align with the 1.3% growth observed from January to October 2024. November's boost brought the monthly consumption to 1.34Mt, nearly 56,000t more than in November 2023. Despite a 41% growth in exports in November 2024, adding 154,387t. This represents an 8.8% year-on-year decline. From January to November 2024, Spain exported 4.54Mt of cement, 0.44Mt or 9.7% less than the same period in 2023.

Aniceto Zaragoza, general director of Oficemen, said "These positive figures are in line with the forecasts we gave at the beginning of 2024, where we expected a moderate recovery towards the end of the year. With 11 months of data now available, it is not risky to predict that we will close the year with slight positive growth, as we anticipated in January 2024. This trend makes us look at 2025 with some optimism, expecting a more solid increase in consumption."

Brazil: Huaxin Cement to buy aggregates producer Embu

China-based Huaxin Cement has signed a deal worth US$187m to buy aggregates producer Embu. Embu owns four quarries in the metropolitan region of São Paulo with a production capacity of nearly 9Mt/yr, according to local news reports. In 2023 it produced 6.3Mt and reported a net profit of around US$3.2m.

US: Sublime Systems negotiates grant

Sublime Systems has completed negotiations with the US Department of Energy for a US$87m grant to build a 'clean' cement manufacturing plant in Holyoke, Massachusetts. The company will now commence site engineering, design and permitting. The Holyoke plant will demonstrate full-scale operations of its cement manufacturing process when production begins in 2026. Sublime Systems expects to create 70 - 90 jobs once its new plant is operational.

A kiln expansion project is underway in Kingston, Jamaica. **Source:** Caribbean Cement.

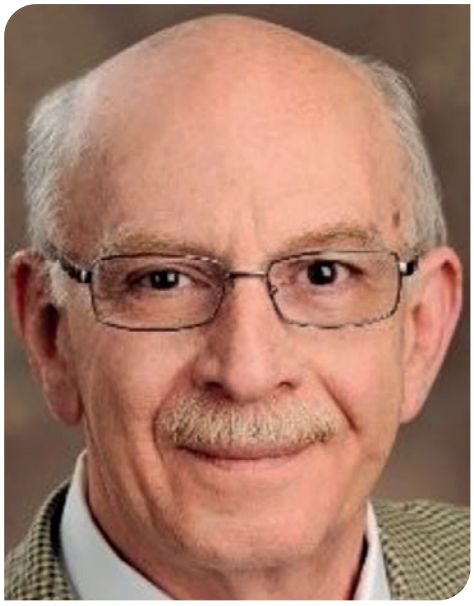
Mexico: Cruz Azul inaugurates crusher at Oaxaca cement plant

Cruz Azul has inaugurated a new limestone crusher at its Oaxaca integrated cement plant in Lagunas in Oaxaca state. Construction of a new mill at the site has also started, according to local press. It was announced in August 2024 that the new grinding mill has an investment of US$40m and it is scheduled for completion by October 2025. The company is also expanding a local hospital. The projects were presented as part of a ceremony linked to the community's 493rd anniversary of the apparition of the Virgin of Guadalupe.

US: ZK Zarif passes away

The passing has been announced of well-known industry figure ZK Zarif, at his home in Florida, US. ZK was educated in Bern, Switzerland, and received an MBA from Duke University in the US. After a stint as VP of sales with ABB in Switzerland, he moved to the US to become president of international operations of Vezer Industrial Professionals, before working for the Industrial Kiln and Dryer Group, and in his own consultancy companies.

ZK spoke seven languages, and was a senior member of associations including the SME, ASME and AMP. He was the chair of the General Practices working group at the IEEE-IAS/PCA cement industry conference, and shepherded many outstanding presentations to the event over several decades. In person he was a warm, generous and courteous person, and he will be greatly missed by family and friends alike.



US/Switzerland: Holcim appoints board and CEO for North American business

Holcim has made progress on the capital market separation of its North American business, naming its future board members. The board will comprise 10 members and will become effective following the execution of the spin-off, expected in the first half of 2025.

Jan Jenisch, current chair of Holcim and its former CEO from 2017 to 2024, has been designated chair and CEO of the new business. Jenisch will remain Holcim's chair until the Annual General Meeting on 14 May 2025. The Board will include nine independent directors: Theresa Drew, Nicholas Gangestad, Dwight Gibson, Holli Ladhani, Michael McKelvy, Jürg Oleas, Robert Rivkin, Katja Roth Pellanda and Cristina Wilbur.

Argentina: Record low despatches

Cement despatches dropped by 24% year-on-year to 9.56Mt in 2024, the lowest annual level reported since 2009, according to the Association of Portland Cement Manufacturers. Total despatches in 2024 reached 9.5Mt, 24% lower compared to 2023 when despatches were 12.5Mt. Despatches in December 2024 showed the lowest yearly percentage decline, falling by 5% year-on-year to 0.77Mt, 12% less than was recorded in November 2024. This marks 21 consecutive months of declines. The declines recorded from December 2023 coincide with the decision announced by President Javier Milei to end the execution of public works by the national government.

US: Vicat subsidiary to develop Lebec net zero project with DOE funding

National Cement Company, owned by Vicat, has signed a cooperative agreement with the US Department of Energy (DOE) Office of Clean Energy Demonstrations to develop the Lebec Net Zero project at its Lebec cement plant in California.

The agreement commits up to US$500m, covering up to 50% of the Phase one cost. The project includes the construction of a CO_2 sequestration facility with a 0.95Mt/yr capacity, enabling the plant to capture 'almost all' of the plant's emissions. It will also increase alternative fuel use from locally-sourced biomass and reduce the plant's clinker factor by producing calcined clay-based cement. The plant will reportedly produce carbon-neutral cement.

The first step will be to conduct a preliminary engineering study and establish a community advisory body in charge of relations with local communities. Phase one will run until the first quarter of 2026.

Interview by Jacob Winskell, Global Cement Magazine

COLOMBIA'S GREEN GIANT: ARGOS CARTAGENA

Cementos Argos' Cartagena plant sits on the Caribbean coast in the producer's home country of Colombia.

***Global Cement (GC):* Please would you introduce the Cartagena cement plant and your role at the plant?**

Alberto Carlos Riobó (AR): Cementos Argos' Cartagena cement plant was founded in the 1970s. At that time, it had a single, wet process kiln line. In the 1980s, this increased to three wet process lines.

An aerial photo of Cementos Argos' Cartagena cement plant in Colombia, with natural gas infrastructure behind.

Source: Cementos Argos.

Alberto Carlos Riobó manages Cementos Argos' Cartagena cement plant. He has 17 years' cement industry experience, including managing Cementos Argos' Toluviejo cement plant in 2009 – 2012. Prior to this, he worked for 15 years in the petrochemical plastics industry. Riobó is a mechanical engineer and holds an MBA in business administration.

In 2010, Argos carried out the Columbus project, which involved the construction of a 2Mt/yr dry process line. This more than doubled the plant's total installed capacity, to 3Mt/yr.

The Cartagena plant has a limestone quarry, with reserves for another 50 years of production, connected by a 2500t/hr conveyor. There is also a recently-expanded marine terminal for the finished product, which commenced full operations in 2023.

I currently manage the entirety of operations at the Cartagena plant, from quarry to port: everything except sales and financial management. I am responsible for the workforce, budget, stakeholder relations, environmental management, compliance and, of course, production.

***GC:* What markets does the Cartagena cement plant supply?**

AR: Together with our fellow Cementos Argos Toluviejo cement plant in Sucre, we cover the whole market in Northern Colombia, alongside export markets. At the Cartagena plant, we produced 2.5Mt of cement and exported 1.5Mt (60%) in 2024. 1Mt of this was to the US and Puerto Rico, with the rest going to other Caribbean islands and Suriname.

For our local sales, we use bags or truck carriers and for export sales mainly bulk carrier ships.

***GC:* What raw materials do you use in cement produced at the Cartagena plant?**

AR: Our quarry supplies 80% of raw material used at the plant. All other minerals are imported via the terminal – copper and iron slag from Japan and Türkiye and gypsum from Spain and Morocco. We are considering also using the terminal to supply another plant in future.

We have three types of products: general purpose cement, high-specification cement, and Portland limestone cement (PLC).

***GC:* How do you keep operations at the Cartagena plant as sustainable as possible?**

AR: Our 2.5Mt/yr line is equipped with artificial intelligence (AI) software to increase production and lower energy consumption. 80% of the time, the line operates by itself, with the AI handling situations as they arise, while an operator monitors key variables.

The line was built to run on a gas-powered generator. Gas is readily available here in Cartagena and a reliable alternative to grid power, 70% of which is sourced from hydroelectric plants in the Colombian interior. As part of Grupo Argos, we are also looking at developing solar power plant projects.

The Cartagena cement plant has a microalgae biofuel plant which captures CO_2 from the air. On site, we move all raw materials and cement using conveyors. We also use 13–15% alternative fuels (AF), including biomass and tyres, and are targeting a 40% substitution rate by 2030.

This will involve building new supply chains and fostering a culture of home recycling in Colombia. We are already moving material from different places around Colombia, and have a processing scheme underway in Barranquilla, 110km away. It would be nice to also get something going in Cartagena, because the material is available here.

***GC:* What are the key challenges currently facing the Cartagena cement plant?**

AR: In our export markets, we face competitors who, let's say, compete through pricing instead of quality. We have top-quality cement, so we are constantly working to increase efficiency to stay competitive.

***GC:* What is the market outlook at the moment?**

AR: We are expecting growth in big markets like the US, if the incoming government can move the economy. If we increase export volumes, we can better compete on price with our general purpose cement, while also continuing to target demand for quality.

In Colombia, with economic growth slower than hoped, the market contracted by 5% in 2024. Our local sales contracted slightly more sharply, due to the entry of new competitors in the clinker import and grinding segment. We remain conservative in our expectations for 2025.

One cement type for which we are targeting a larger market share is our high-specification cement, which is aimed at industrial customers. The trend domestically is towards 50:50 general purpose cement and other types of cement, while general purpose is more important in the export market.

***GC:* What are your targets for the plant?**

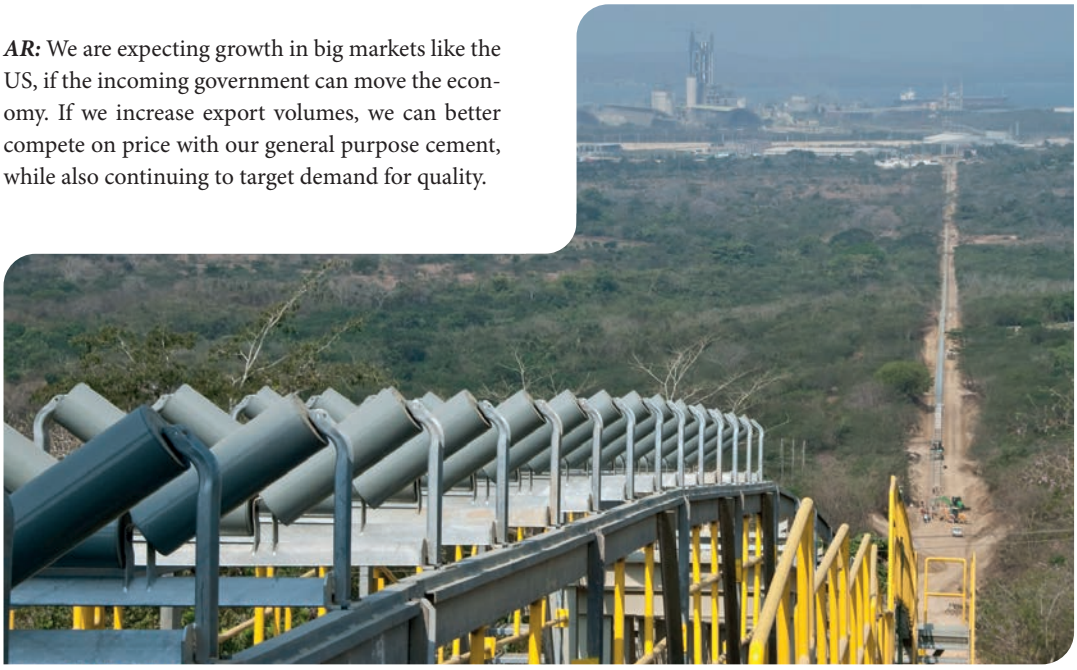
AR: The plant represents 33% of Cementos Argos' Colombian sales in financial terms. We will try to keep that same proportion in 2025, even in spite of growth elsewhere in the group. As I have said to my team, "Any other plant close to us is a competitor!" Of course, plants actually share methodologies, technologies and experience with each other across Cementos Argos.

Lastly, I want the plant to continue to become even more efficient and reliable.

***GC:* What makes you proudest about the plant?**

AR: We are proud of our relationship with the community in Cartagena, where we support training, education and development.

Cementos Argos is committed to building Colombia. There are always two additional considerations in all we do, namely our impact on the environment and on communities.



Right: Cementos Argos' Cartagena cement plant with its raw materials conveyor in the foreground.

Source: Cementos Argos.

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India: Nuvoco Vistas wins bid to acquire Vadraj Cement

Nuvoco Vistas has won a bidding process to acquire Vadraj Cement through a corporate insolvency resolution. The acquisition includes Vadraj's 6Mt/yr grinding unit in Surat and 3.5Mt/yr clinker capacity in Kutch, increasing Nuvoco Vista's production capacity of 25Mt/yr by over 20%. The value of the deal was not disclosed.

Nuvoco will acquire Vadraj Cement through its subsidiary Vanya Corporation, which was incorporated in November 2024. The company said that it plans to fund the acquisition without a significant rise in its consolidated debt levels. It plans to invest in Vadraj Cement over 15 months to bring in operational improvements before commencing production in the third quarter of the 2027 financial year. The acquisition awaits National Company Law Tribunal approval.

The company stated in its press release "With this transaction, Nuvoco's total cement production capacity is set to increase to approximately 31Mt/yr, distributed as 19Mt/yr in the East, 6Mt/yr in the North, and 6Mt/yr in the West, consolidating its position as the fifth-largest cement group in India."

India: UltraTech Cement acquires stake in Star Cement

UltraTech Cement has acquired an 8.69% stake in Star Cement for US$99m, at US$2.74/share. According to local news reports, this minority stake acquisition could lead to UltraTech Cement eventually buying out Star Cement entirely, similar to its previous acquisition of India Cements on 20 December 2024.

Türkiye: Oyak Cement to invest in RDF at Adana plant

Oyak Cement will invest US$4.59m to increase fuel supply capacity at its Adana plant. The producer will add 180,000t/yr of processing capacity to the existing 36,000t/yr refuse-derived fuel (RDF) production capacity, raising the total to 216,000t/yr. It will also establish a biomass facility with a capacity of 180,000t/yr. The RDF will be prepared at a fuel preparation facility for use in the cement plant.

South Korea: Cement industry hit

The cement industry in South Korea faces rising costs due to a rising won-to-dollar exchange rate following the attempted impeachment of the president, and transportation disruptions from a railroad strike. This is likely to lead to an increase in coal import costs, according to local news reports.

The ongoing strike by the National Railroad Workers Union has disrupted cement transportation, though stockpiles in metropolitan areas have mitigated immediate effects. However, prolonged strikes could force production halts.

Kim Seung-jun, researcher at capital market company Hana Securities, said "In the fourth quarter of 2024, cement production is expected to decrease by 14% compared to the same period in 2023."

Kyrgyzstan: Cement import ban lifted

Kyrgyzstan has lifted the temporary ban on the import of various types of cement. The Cabinet of Ministers signed a resolution to allow the import of Portland cement, aluminous cement, slag cement and similar hydraulic cements, in ready form or as clinker.

BGC's cement assets will be acquired by Cement Australia. **Source:** BGC.

Australia: Cement Australia to acquire BGC Cementitious division

Cement Australia, a joint venture between Heidelberg Materials Australia and Holcim Australia, will acquire the cementitious division of the Buckeridge Group of Companies (BGC) in Perth for US$800m. The acquisition includes a cement grinding unit with 'significant' capacities, along with operations in cement, concrete, quarry, asphalt, transport and a materials technology centre. Cement Australia reportedly 'fended off competition' from Boral, Adbri and Mass Group in the process. BGC has stated that it retains a 'significant' business with about 1000 employees across its other sectors. The acquisition remains subject to regulatory approval, but is expected to close in the second half of 2025.

Vietnam: Vicem reports financial losses in 2024

Vietnam National Cement Corporation (Vicem) has reported consolidated losses for the second consecutive year, of US$55.15m, according to a draft annual report by the Ministry of Construction. Vicem is the only company among six under the ministry to record losses in 2024, with its loss reportedly due to 'unfavourable market conditions'. Its parent company's loss reached US$9.33m. In 2023, it reported its first-ever loss of US$44.5m amid a drop in demand following the 2016 economic slowdown. By the end of 2023, cumulative losses reached US$88.24m.

The Ministry of Finance's inspection department recently highlighted capital loss risks in Vicem's subsidiary investments, requiring provisions exceeding US$118.2m. Inspectors have urged the company to assess the financial performance of underperforming businesses.

Pakistan: Cement trends in 2024 revealed

December 2024 saw mixed results for cement despatches, according to data published by the All Pakistan Cement Manufacturers Association. Local despatches declined by 5% year-on-year, falling to 3.37Mt from 3.54Mt in December 2023. Overall, total cement despatches for December 2024 stood at 4.15Mt, up by 2% from 4.06Mt year-on-year. For the first half of the fiscal year, total despatches decreased by 4% to 22.9Mt. Domestic despatches saw a significant drop of 10%, totalling 18.1Mt. Exports, however, witnessed a 32% increase, reaching 4.81Mt during this period. In December 2024, exports reached 0.78Mt, a 49% year-on-year increase from 0.53Mt in December 2023.

Afghanistan: Over US$600m invested in new cement plants

The office of the Deputy Prime Minister for Economic Affairs said that the country has invested over US$600m in the cement sector since the Taliban administration took charge in 2021.

At a recent event for the newest cement plant, Acting Minister of Mines and Petroleum Mullah Hidayatullah Badri said "Since the establishment of the Islamic Emirate of Afghanistan, the Ministry of Mines and Petroleum has signed agreements for four major cement projects valued at approximately US$623m with domestic and foreign investors, and work on these projects is progressing rapidly."

At present the local cement sector has a reported production capacity of 5Mt/yr.

Acting Minister of Mines and Petroleum Hidayatullah Badri and Wu Zidan, head of SAKO Afghan, sign an agreement for a new cement plant in Logar province. **Source:** Bakhtar News Agency.

Azin Dashtban Jami, West Asia Cement Company

CEMENT SECTOR FUELS IN IRAN

This article explores the ongoing challenges associated with sourcing fossil fuels for cement production in Iran.

Iran was the eighth-largest global cement producer by capacity in 2023, with a capacity of 89.7Mt/yr. The country also holds the second-largest natural gas reserves globally. According to the National Standard Organization of Iran (NSOI), the cement industry consumed 7.8 million MWh of electricity, 6.2Mm^3 of natural gas and 1.2Bn litres of heavy fuel oil in 2022. Across all plants, the average electricity consumption was 122.37kWh/t of cement and average fuel use was 3.97GJ/t of cement. These figures are higher than the global average for electrical (110kWh/t) and thermal energy consumption (3.4GJ/t). This indicates that the cement industry should be able to reduce energy consumption and that optimising energy use is essential.

Iranian cement fuels

Natural gas is the primary fuel for the cement industry in Iran during the warmer months. However, limitations in the supply of gas to the cement industry during the colder months arise due to increased domestic gas use, which takes precedence over industry. Indeed, the amount of natural gas needed by the Iranian cement industry is ~27Mm^3/yr. However, the volume allocated in 2023 was just 6Mm^3/yr. This has led to plants using fuel oil or even shutting down during the winter, which is adversely affecting Iran's ability to produce cement at the national level. US-led sanctions also hinder many industries in the country, cement included.

View of West Asia Cement Complex.

The current situation

While they may appear similar, not all fossil fuels are created equal. This means that identifying and determining the physical and chemical properties of fossil fuels is becoming increasingly important for cement producers in Iran. At present, oil and gas companies are in charge of determining the calorific value (CV) of the fuels they produce and the CV is the primary parameter by which fuels are assessed. This approach has caused irreparable damage to the cement industry. According to reports from the Cement Employers' Association of Iran, the CV of natural gas increased by ~11.7% between 2021 and 2023, but this has not led to positive effects in any of the 100 kilns that use it. In some cases, reductions in fuel quality have even damaged plants.

Similarly, the CV of heavy fuel oil is reported to have increased by about 5.2% between 2019 and 2023. However, fuel oil is not standardised, and its sulphur content fluctuates between 1.2% and 4.0%, which can have negative effects on fuel quality. Despite this, the NSOI reports that the CV of heavy fuel oil rose every year during this period. It is clear that, while important, CV is only part of the story.

The challenges of heavy fuel oil

As it stands, there are three main issues when it comes to dealing with heavy fuel oil in the Iranian cement sector.

1 **High and variable costs:** The prices of natural gas and fuel oil are influenced by factors that include government policies and fluctuations in global markets. Unfortunately, cement plants, having switched to heavy fuel oil, find that it is more expensive than natural gas, mainly due to transportation costs. Under these circumstances, where the cement industry has been compelled to invest heavily in new storage tanks, it had been expected that the Ministry of Petroleum would facilitate heavy fuel oil supplies to plants. However, progress has been patchy at best. At present, it is the cement industry that is helping the country by using heavy fuel oil to stretch out the gas supply for residents. The process of manufacturing cement is becoming more difficult every day.

Given this new reliance on fuel oil in the cement industry, it is anticipated that the additional costs and damages will not be incurred by plants themselves. However, it is important to note that high transport costs from the refinery must be paid months before the heavy fuel oil is used. The price difference is claimed at the time of consumption, not supply. This opens up producers to the prospect of losing money over the period during which the fuel is being transported and stored, in the event that prices change. Complex bureaucratic mechanisms for the delivery of fuel oil and / or the issuance of permits to use it further complicate the situation for cement producers.

2 **Poor access:** Access to natural gas is uniform across Iran, but fuel oil is not distributed equally. The National Iranian Oil Products Distribution Company does not directly supply fuel oil to plants, which must transport it themselves. It is expected that fuel oil would be delivered to regional fuel storage facilities but, not only is this expectation unmet, plants are often directed to refineries far away from where the heavy fuel oil is required. The cost of procuring fuel oil from such distant locations is very high. Furthermore, some cement plants near large cities, such as Isfahan, Tehran, and in parts of the north, may even be prohibited from using fuel oil during the cold months due to concerns regarding air pollution.

3 **Issues with quality:** The quality of fuels available in the Iranian market can vary significantly, impacting both CV and performance. It is entirely possible that heavy fuel oil supplies will not conform to the CV level stated by the supplier, leading to higher than expected consumption, or that fuels will contain unwanted contaminants. Low-quality fuel oil and contamination also present additional challenges. Although the Petroleum Products Distribution Company insists that this fuel oil has a higher CV, its use often results in lower production consistent with the cement producers' version of events. Of course, ultimately, the responsibility for purchasing the fuel lies with buyers.

Access to natural gas is evenly distributed across all parts of Iran.

Concluding remarks

In summary, it can be concluded that securing the heavy fuel oil has become a significant challenge for cement plant operators in Iran in recent years. The author is hopeful that the situation will be addressed by the authorities in the future, but warns that Iranian cement producers should also be prepared for the long haul.

The authors wish to thank Eng. Lashani for his assistance with this article.

A heavy oil truck crosses the Great Salt Desert in Iran. **Credit:** The Road Provides / Shutterstock.com.

Nigeria: Huaxin Cement to buy Lafarge Africa for US$1bn

Holcim plans to sell Lafarge Africa to China-based Huaxin Cement for an equity value of US$1bn. The Switzerland-based building materials producer owns an 83% share of the subsidiary. The transaction is expected to close in 2025 subject to regulatory approvals.

Lafarge Africa operates four integrated cement plants in Nigeria at Sagamu and Ewekoro in Ogun State, at Mfamosing in Cross River State and the Ashaka Cement plant in Gombe State. It has a combined production capacity of 10.5Mt/yr. The company also holds a ready-mixed concrete production capacity of 0.4Mm^3/yr. Its local recycling subsidiary, Geocycle, reported an alternative fuels thermal substitution rate of 37% in 2022.

Lafarge Africa's Ashaka plant.
Source: Lafarge Africa.

Kenya: East Africa Portland Cement shuts down

The Ministry of Mining has ordered the shut down of all mining operations at East Africa Portland Cement Company due to a US$4m debt the company owes the government. The cement producer has also been accused of operating illegally since 2016, according to news reports. Its sites reportedly lack safety equipment, have failed to register vehicles that transport limestone and are accused of other infringements. Police have been sent to the company's quarries to ensure they stop work.

The East Africa Portland Cement Company runs quarries at Portland and Sparetech in Kajiado and Kibini in Sultan Hamud.

A grinding plant was inaugurated in Mozambique.
Source: Presidente Filipe Nyusi/Facebook.

Saudi Arabia: Al Jouf Cement's 'green' cement approved for NEOM projects

Al Jouf Cement's board of directors has approved the use of its 'green' cement for projects in the new NEOM city. The product was developed in collaboration with ready-mix concrete producer Asas Al-Muhailb, with Al Jouf Cement stating that it enhances concrete performance by improving durability and longevity, and reducing water absorption and permeability. It is reportedly resistant to sulphate and chloride salts, has 'equal or greater' compressive strength compared to ordinary Portland cement (OPC), and provides benefits in heat insulation and fire resistance.

Mozambique: Niassa cement grinding plant inaugurated

President Filipe Nyusi has inaugurated a grinding plant in Niassa Province, northern Mozambique, valued at US$20m. The plant has the capacity to produce 0.2Mt/yr of Portland cement, according to local news reports.

Nyusi said the plant would supply Niassa and neighbouring provinces, including Cabo Delgado, Nampula and Tete, improving competitiveness in the northern market and reducing reliance on imports impacted by exchange rates. The plant is expected to lower market and transport costs, particularly for remote districts.

Present Nyusi said "The plant already has 100 workers, which means that 500 people will benefit directly from this plant in terms of income, and many more will benefit indirectly."

The first stone for the construction of the plant was laid back in October 2018 by former Niassa governor Arlindo Chilundo.

Nigeria: New road for upcoming Bauchi cement plant

The Bauchi State government has approved a US$7.9m road project to support the development of the Gwana cement plant in Alkaleri. 10,000 people will be employed in the construction of the plant when the project starts in the next two years, according to local news reports. Feasibility studies for the plant have reached an advanced stage for the location of the plant by Resident Cement Company.

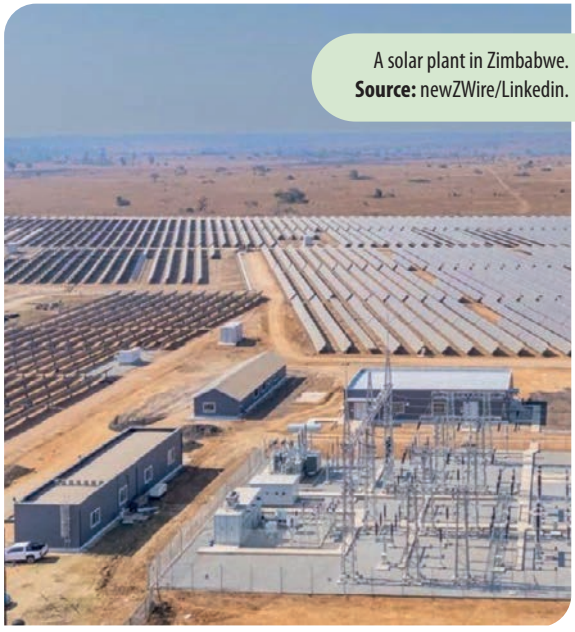
The plant will generate 100MW of electricity for the plant from coal, with surplus power supplied to nearby communities.

Zimbabwe: PPC to speed up solar plant projects

PPC Zimbabwe says it is speeding up the construction of two solar power plants, with a combined capacity of 30MW, to enhance power supply to its cement plants. The company plans to start work on the solar units from the first quarter of 2025 with completion scheduled for the second half of 2026, according to local press. Albert Sigei, Managing Director, said that the company was also continuing to work with the Zimbabwe Electricity Transmission and Distribution Company (ZETDC) to improve the electricity supply.

Kenya: Holcim divests Bamburi

Holcim has completed the divestment of its Kenyan operations by selling its entire 58.6% stake in Bamburi Cement to Amsons Group. The transaction has resulted in cash proceeds of over US$100m for Holcim, according to the company's press release.



A solar plant in Zimbabwe. **Source:** newZWire/Linkedin.

Zimbabwe: Villagers oppose Chinese cement plant over alleged illegality

Villagers in Hurungwe District are protesting against a cement and power plant project by WHI-ZIM Construction Material Investments, alleging illegal land seizures, lack of compensation and environmental risks. WHI-ZIM, a joint venture between Lebanmon Investments and West International Holding, has pledged US$1bn for the project in Mashonaland West, promising 5000 jobs and local infrastructure upgrades. However, more than 80 families face displacement without clear relocation or compensation plans, according to local news reports. Residents accuse the company of forcibly depositing materials on communal land without legal permits. Chief Chanetsa of Hurungwe endorsed the project on 135 hectares, citing community benefits, including schools, clinics, boreholes and a 45km road. He said "If there is any field affected within these 135 hectares, we have agreed with the company that it shall fully compensate the affected area."

Environmentalists and villagers have warned of risks to Magunje Dam, the villagers' water source located 1.4km from the plant. They allege irregularities in the Environmental Impact Assessment (EIA), which mandates compensation and relocation before work begins. Residents claim WHI-ZIM ignored EIA conditions and began fencing communal land in July 2024.

A community activist said "The corruption here is blatant. People are being forced off their land while officials look the other way."

Jacob Winskell, Global Cement Magazine

CEMENT IN TÜRKIYE

Türkiye's location at the junction of Asia, Europe and the Middle East, combined with a proactive export strategy, has helped to make it a global top-five cement producer. In 2025, import partners are taking producers to task with new demands for a premium product mix, including reduced-CO_2 cements. The cement sector in Türkiye has responded with investments in its plants – and the discovery of new export markets.

Construction in Türkiye has a 12,000 year-long history, beginning with the Göbekli Tepe settlement in Southeast Anatolia, now a UNESCO World Heritage site. Its Stone Age builders participated in the Fertile Crescent cluster, where they domesticated corn, cattle, pigs and sheep by 8000BC. Another UNESCO World Heritage site, across the country in Marmara – Troy – developed over several phases between 3600BC and the Roman period. Its ruins sit across the Dardanelles from Gallipoli, where Mustafa Kemal Atatürk and Turkish forces successfully defended the country against an Allied invasion in 1915 – 1916. The campaign cost 77,600 Turkish lives, but, following Ottoman defeat in 1918, helped to inspire the Turkish Independence Movement and the formation of Türkiye under President Atatürk.

BatıÇim's Izmir cement plant in Aegean Region.

Source: *BatıÇim.*

Türkiye

Population:[1] 85.3m (+0.5%)

Gross domestic product (GDP): US$1.12tn (+23%)

GDP/capita: US$13,100 (+23%)

Capacity: 120Mt/yr

Capacity per capita: 1.4t/yr

Production: 84.6Mt (+11%)

Capacity utilisation: 71%

Markets

Türkiye has US$325bn in planned infrastructure spending in 2024 – 2033.[2] Market research consultancy 6WResearch has forecast 5% composite annual growth in national cement consumption up to 2031.[3] The market is relatively concentrated under the control of local producers, which sold 68.9Mt domestically in 2023, up by 18% year-on-year from 58.3Mt in 2022.

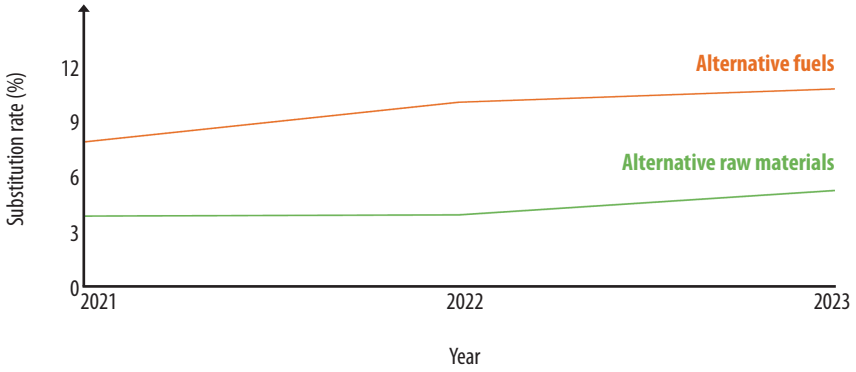
According to the provisional data from the Ministry of Trade, Türkiye exported US$1.1bn-worth of cement and clinker in 2024. This corresponds to a year-on-year decline of 13%. Full-year cement exports were 15.7Mt in 2023, down by 19% year-on-year from 18.7Mt in 2022.[4] Türkiye exported 19% of its total production in 2023, compared to 24% in 2022. Besides cement, Türkiye also exported 4Mt of clinker in 2023, down by 53% year-on-year from 8.5Mt. European countries received 2.08Mt (52%) of this.

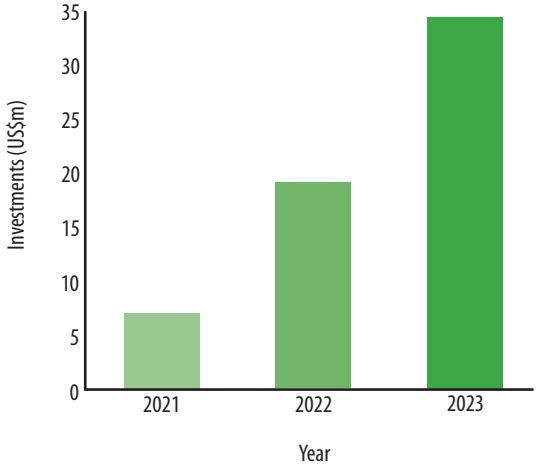
Meanwhile on Türkiye's southern border, Syria, following its regime change on 8 December 2024, is forecast to need 50 – 60Mt of cement over 10 years to help rebuild its demolished infrastructure.[5]

Right – Figure 1: Alternative raw materials and alternative fuel substitution rates across 53 Turkish cement plants, 2021 – 2023.

Below – Figure 2: New investments in renewables across 53 Turkish cement plants, 2021 – 2023.

Source: *Türkçimento*.





Sustainability

Cement, along with the rest of Türkiye's industries, is committed to complete decarbonisation by 2053. Addressing the 66th General Assembly of the Turkish cement industry association (Türkçimento) in 2024, Chair Fatih Yücelik said that the cement sector will need to invest US$30bn to meet the target.

Türkiye already stands to pay an additional US$2.5bn/yr in costs accrued under the EU's incoming Carbon Border Adjustment Mechanism (CBAM). Upon full implementation in 2034, Türkiye's major clinker export partner can be expected to rely mainly on reduced-CO_2 cement.

Yücelik has argued that there is a chance for Türkçimento's members to avoid additional costs – and retain their EU market share. In order to do so, they will need to invest US$2bn in plant upgrades.

In November 2024, major producer Çimsa took a US$70m loan from the International Finance Corporation for upgrades to reduce its CO_2 emissions by 10% and increase its renewables use to 20%.

Conclusion

Türkiye's cement producers and exporters face changing times. A way forward appears clear; sourcing the necessary investments may not be so simple.

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TÜRKÇİMENTO TECHNICAL SEMINAR: REPORT

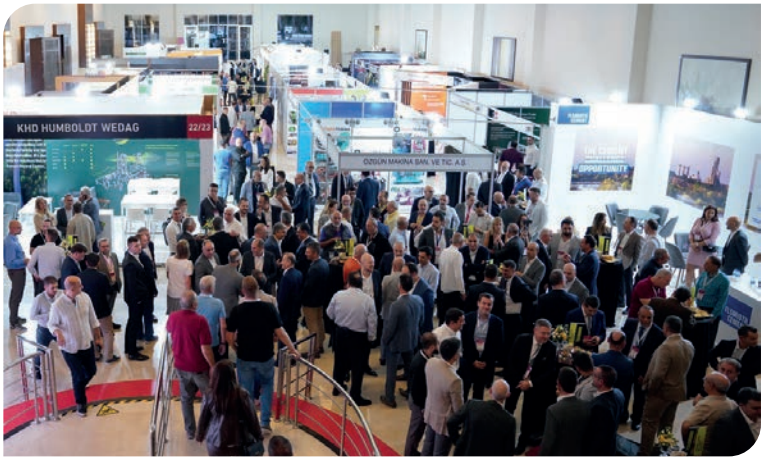
The Turkish cement industry association, Türkçimento, hosted its 17th International Technical Seminar and Exhibition at the Kaya Palazzo Golf Resort Belek in Antalya, Türkiye, on 2-5 November 2024. *Global Cement* was in attendance for a characteristically action-packed programme of talks and an abundance of booths, spread across two exhibition halls.

Opposite: Türkçimento chair Fatih Yücelik addresses the conference.

Source: *Türkçimento*.

Taking place every two years, Türkçimento's Technical Seminar and Exhibition is a good gauge of larger cement trends in Türkiye and beyond. Amid all the recent events impacting the cement world, entirely new topics of discussion have debuted from one iteration to the next: in 2022, it was a newly adopted EU proposal for a Carbon Border Adjustment Mechanism (CBAM). This time, there was a real, partly operational CBAM to talk about.

Far from just being reactive, Türkçimento and its members are meeting the quickening changes in global cement consumption, as demonstrated by the technologies under discussion in the exhibition and in talks under the event tagline 'Integrating the Triple Transformation in the Cement Industry.'



Below: The main exhibition hall at Kaya Palazzo Golf Resort Belek, viewed from beside the *Global Cement* stand at the entrance.

Source: *Türkçimento*.

Association Chair Fatih Yücelik introduced the Triple Transformation as a transition to new processes in and around cement production that are 'digital, social and green.' He concluded his welcome by saying "We are the foundation of Türkiye."

Further addresses by European Cement Association (Cembureau) CEO Koen Coppenholle, China Cement Association Secretary General Wang Yutao and Global Cement and Concrete Association CEO Thomas Guillot underscored the international dimension of Turkish cement's transformation.

In the first session, European Cement Research Academy CEO Martin Schneider's presentation featured a 'probably not complete' list of 47 on-going carbon capture installations – something seemingly unthinkable the last time Türkçimento held the event! If there were an overall message from proceedings, however, it was that change is not about any single solution, but a lot of them, put together.

Global Cement looks forward to returning in two years' time, in 2026. With everything going on in the industry, it will likely feel like longer.

These pages give *Global Cement's* monthly review of global cement prices - in US$ for easy comparison. Some price information is only available to subscribers to *Global Cement Magazine*. Subscribe on Page 64. Subscriber prices in this issue come from Nigeria, Liberia, Saudi Arabia, Russia, Pakistan, Türkiye, Azerbaijan, Tanzania, Kazakhstan, China and Kiribati. Prices are for metric tonnes unless otherwise stated. US$ conversions from local currencies are correct at the time of publication.

EU ETS: The price of a permit to emit one tonne of CO_2 under the EU Emissions Trading Scheme (ETS) was €74.85/t on 10 January 2025. This represented a 1.4% week-on-week decrease from €75.94/t on 3 January 2025, a 9.8% month-on-month increase from €68.18/t on 10 December 2024 and a 7% year-on-year increase from €69.98/t on 10 January 2024.

Egypt: Ex-works cement prices as at 13 January 2025 from www.cementegypt.com: Ordinary Portland cement cost between US$54.85/t (Nile Valley Cement and Arabian Cement Company) and US$60.79/t (El Sewedy Cement). White cement cost between US$79.20/t (Sinai White Cement and Royal Minya White Cement) and US$81.18/t (Sinai White Cement, Royal Minya White Cement and Helwan Minya Cement). Blended cement prices were between US$41.58/t (Royal Minya White Cement) and US$44.75/t (National Cement Company in Beni Suef). Sulphate-resistant cement cost between US$56.43/t (Assiut Cement) and US$62.96/t (El Sewedy Cement).

Uzbekistan: Cement prices were solely determined by supply and demand in 2024, with the average price at cement plants ranging from US$38 - 45.38/t.

Vietnam: Vietnam's cement industry faces challenges as production costs continue to rise, prompting producers to raise prices by US$2.08/t in early January 2025.

Companies are implementing price adjustments to mitigate financial losses and avoid halting production. The Vissai Group announced a US$1.82/t price hike for its facilities, while most other producers raised prices by US$1.97/t. Thang Cement Joint Stock Company increased its selling price by US$1.97/t (including VAT) for all types of Tan Thang bagged and bulk cement. For 2024 as a whole, Vicem reported that average Free on Board export prices were US$40-45/t.

India: All-India average cement prices were US$3.89/bag (50kg) at the end of December 2024, less than US$0.01/bag more than three months earlier, according to Nomura Global Markets Research. Prices fell in the east, centre and south of India, but rose in the north and west. The north was the leading region for increases, with a 2.5% rise to US$4.14/bag in the three months to 31 December 2024. Western India saw the second-largest increase in prices during the September-December 2024 quarter at US$0.70/bag.

Bucking the national trend, the state of Chhattisgarh - in India's central region - has seen a sudden and steep increase in cement prices so far in 2025, with Raipur MP Brijmohan Agrawal writing to senior government officials to demand counter measures.

Previously, cement was sold at just US$3.00/bag in Chhattisgarh. However, as of 8 January 2025 it was reported to be US$3.58/bag, a 19% rise over the turn of the new year. For government and public welfare projects, the price has increased from US$2.36/bag to US$2.88/bag, with indications of further rises in the pipeline.

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Should the cement industry be more random?

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

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I recently discovered the marketing expert Rory Sutherland, a fiercely insightful and witty 'chap' from the British 'old school.' Sutherland has worked for the marketing firm Ogilvy and Mather since the 1980s, where he founded the company's Behavioural Science Practice (BSP) in 2012.

The BSP looks at how companies can leverage human psychology to better market their products and services. Your first impression may be that it probably specialises in underhand techniques that will part you from your hard-earned cash. This is an understandable response but, far more often, the job of the BSP is to re-frame issues so that companies can better serve their customers. This, in turn generates better returns from *happier* customers.

So how does it do this? There are many examples of how businesses have used simple and often low cost strategies to change perceptions for the better. For example, Sutherland argues that Uber is not cheaper or quicker than a regular taxi, but it does show users exactly where their ride is and how long it will take to arrive. This does away with the stress and uncertainty of the wait. Most people are happy to wait nine minutes when they know it will be a nine minute wait, but become stressed over a five minute wait when they don't know where their driver is.

Re-framing can also come into play when comparing products to others in the market. A luxury car manufacturer noticed that it wasn't selling well at motor shows because its cars seemed expensive next to other vehicles. Instead of lowering its prices, the manufacturer pivoted to yacht and plane shows. Its cars subsequently sold far more easily as, against a backdrop of multi-million dollar machinery, a US$500,000 car suddenly looked 'cheap.' In a similar vein, it was thought for many years that a rival to Coca Cola would have to be cheaper, tastier and come in a larger can. The emergence of Red Bull - "more expensive, awful tasting (according to Sutherland) and in a tiny can" - would appear to refute these assumptions.

Sutherland uses this last example to point out that the opposite of a good idea is not necessarily a bad idea, it could be another good idea. This is highlighted by the simultaneous existence of convenience stores *and* farmers' markets. Sometimes people want to rush into a store, grab five items, tap their card on an automated register and leave within two minutes. At other times, they want to spend a morning wandering between five different stalls to buy five items, chat to the stall holders and stop off for a coffee. A convenience store laid out like a farmers market would be a nightmare!

Throughout his examples, Sutherland points out that 'logical' arguments usually win out in business decisions, often at the expense of customer experience and, ultimately, the business itself. He cites the €6bn upgrade to the railway line between London and the Channel Tunnel in 2007 as a project that was not given the opportunity to explore a full range of options.

The technical team, when challenged to upgrade the service took the view that 'faster equals better' and built an entire new US$8bn line that cut 40 minutes from the London to Paris journey. What, asks Sutherland, would have happened if the contract had been given a high-end restaurant? Instead of building the new track, he suggests that it could have employed the world's top male and female models to serve free food and drinks for less than 10% of the cost of the new track... and passengers would plead for the train to be slowed down! What about handing the contract to Disney? It might have themed the carriages, provided soft-play areas for children and built cinema carriages for their parents. These solutions may not be for everyone, but neither is a marginally reduced transit time if you're staring out of the window. Even free WiFi would have been a major upgrade in the 2000s.

So... what can the global cement sector learn from Sutherland's observations? Businesses should consider economic, psychological and technical angles when seeking solutions and marketing their products and services. The best solutions are to be found where these three considerations are all broadly satisfied. Those launching low-CO_2 cements should take note.

Sutherland argues that logical arguments currently take precedence in the boardroom because they can be demonstrated to be 'best' on a spreadsheet. This is a risk-averse approach that only selects solutions from an artificially small range of options, as seen in the case of the London-Paris train line. This approach insulates number crunchers from any repercussions should their suggestions fail, but leads companies to similar conclusions to their competitors. Sutherland suggests that being selectively random can offer major wins for brave leaders. Otherwise the company won't be able to gain any advantage over its competitors at all.

So... Are you feeling random? The real options may be more numerous than you think.

To find out more on these ideas and more, visit: www.youtube.com/watch?v=iueVZJVEmEs

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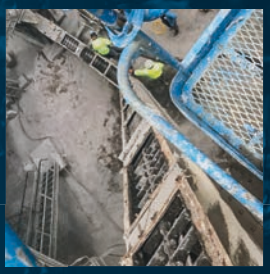

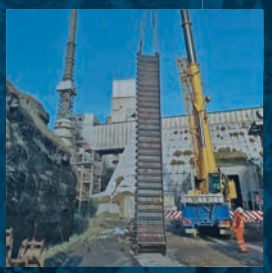

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