

Interview by Peter Edwards, Global Cement Magazine

Meeting the challenges of the 2020s

Angus Maclean from consulting firm Proudfoot gives his take on the cement sector's opportunities and risks of the 2020s...



Above: Angus Maclean, Proudfoot.

Global Cement (GC): What is the biggest challenge to cement producers' success in the 2020s?

Angus Maclean (AM): The largest challenge for cement businesses in the 2020s will be continuing to provide strong shareholder returns while operating in an increasingly tight regulatory environment. While this will be most notable in developed markets, particularly Europe, there will be tighter restrictions everywhere. The fuels that can be used, 'traditional' emissions limits and clinker factor will come into focus like never before. CO₂ reduction management will be a major factor too, not just a 'nice to have.'

Over the next 10 years we will see a surprisingly high number of older plants become obsolete on a technical front. At the end of the day, these plants make money from producing cement. If they cannot perform to the new standards, they will become a burden and will be closed. The trick for producers is to optimise their inventory now so they're not caught out later.

GC: What can producers do to handle these risks?

AM: There are two angles we can use to think about walking this increasingly tricky tightrope. First is the workforce. Put bluntly, the global cement workforce is not well prepared for the future. Not only is it increasingly hitting retirement age, but there is no new blood coming in. The cement industry, whether it knows it or not, is in a period of intense resource competition for workers of all types. Indeed, some US ready-mix concrete firms have already reported lower sales that can be directly attributed to fewer drivers.

This issue will only become more pronounced in the future as roles increase in complexity. Newer workers, for example data scientists and networking /IoT experts, are vital if cement producers are to respond effectively to all kinds of new challenges. Indeed, companies are now rushing to digitise to minimise the human input elsewhere. Of course, every other sector actively recruits these same workers. Some sectors, finance, insurers, retailers, aerospace, power, may be in a position to outcompete the cement industry in terms of what they're willing to pay and some of them already have a head start. It's going to be very tough.

Right: The 2Mt/yr Loma Negra (Inter cement) plant at Olavarria, Argentina. **Source:** Diego Hall, entrant to the Global Cement Photography Competition.



The second angle is on the technical side. There are things to learn from other industries. For example: A low cost airline might only buy 737s or A319s and keep them for 6-7 years before replacement. Maintenance costs are minimal with such an approach, not just because the planes are always nearly new but because they are identical across the fleet. If a cement producer took the bold step of applying that kind of approach to the cement sector, they could stand to gain quite significantly. Changing equipment every 5-10 years might seem wasteful but the plants would always be running at, or very close to, the best available technology in terms of process efficiency, emissions, digitisation and more.

GC: Would that feed into the trend we're seeing toward centralised clinker production and regional grinding plants?

AM: Indeed it could - A huge clinker plant, perhaps even larger than the 12-13Mt/yr monsters seen in Asia, could service a large number of grinding plants. The grinding element would be operated akin to the low-cost airline model. This is potentially very good news for manufacturers of modular grinding plants!

GC: What other operational challenges will the 2020s bring?

AM: Companies will have to deal with changes to the cement product itself. It is clear to me that there will be a fairly major transition to cements containing calcined clay, the kind of which have been promoted extensively by the LC3 project. This means 50% clinker or less, which changes the amount of clinker a given group needs to produce, while increasing the amount of time and attention it spends on securing other materials.

Elsewhere, some players are taking the approach that the end product is not cement, but a modular concrete block, not unlike LEGO blocks. There will be opportunities for cement producers to move up and down the value chain, which will mean increased concrete recycling, alternative raw materials and more participation by 'cement producers' at the building site itself. A common theme, whatever product is being made, will be the elimination of human labour wherever possible through digitisation. In the future this could even extend to robotic site 'workers.'

GC: Is digitisation really a 'golden bullet' for cement plant optimisation?

AM: The cost of digitisation, particularly cloud computing, have now dropped to the point that they are accessible to most cement plants. Cloud-based solutions can compete very favourably with established control and optimisation methods, so the potential



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Above: New skills are needed to help cement producers navigate the 2020s... but are there enough to go round?

ongoing savings are massive, even before the optimisation benefits are considered. Cement players are still behind the curve on digitisation despite fairly significant efforts over the past few years towards digitisation and computer / AI control. This includes fleet management in the quarry, dispatch from the plant and cloud computing approaches for the kiln, mills and other parts of the plant.

Only in the past 6-9 months, however, have producers woken up to the fact that these systems are all disconnected from each other. Their business knowledge is all over the place and nobody can have full oversight. The true benefits of digitisation cannot be realised until the producer can see the full picture. There are also issues surrounding scalability of digital solutions. Something that works in a particular plant designed in the 2000s may translate badly to one from the 1970s.

To show how much of an undertaking this can be, even seemingly innocuous tasks like simplifying a spare parts list is a huge headache. Within a single company there will be different numbering systems for parts at different plants. Translating between them is inefficient, but sorting it out is also really expensive and time consuming. What Proudfoot is doing right now is helping producers, of all sizes, gain control of their chaotic IT systems.

GC: Which kind of cement producers are best placed to handle all of the challenges you've described above?

AM: There are advantages and disadvantages for cement producers that vary depending on their



Above: Could mammoth clinker plants combined with local grinding plants be an effective cement sector strategy in the 2020s?

Source: Krzysztof Burek, Caspi Cement (HeidelbergCement).

location and their size and it's difficult to say that one set of advantages/disadvantages is better or worse than any other. Large producers are often characterised as being hard to change, but there are notable examples of fantastic innovation driven by central funding. Mid-size regional players are well placed to adapt rapidly to changing circumstances while not being reliant on any given market. There are examples of this in the Mediterranean region, for example CIMAT in north-west Africa and Cem'In'Eu in the EU. The risk in this position is biting off more than you can chew. Smaller players know their own markets intimately, but may find themselves under pressure to sell up to bigger players.

GC: Will consolidation, driven by business and financial optimisation, speed up or slow down in the 2020s?

AM: I think consolidation will continue at the same rate as in the late 2010s for the foreseeable future. LafargeHolcim has sold many assets recently and may continue in that vein. CRH is selling various chunks of the business and Cemex is offloading several non-core assets too. Just in January 2020 it announced the sale of a raft of UK concrete assets. We can expect a lot more of the same, from these players and more besides.

GC: How can Proudfoot help producers meet the challenges of the 2020s?

AM: Proudfoot is working with many of the Top 50 cement firms to identify the operating methodologies they aspire to achieve. We do this with Target Operating Models (TOMs). These develop and ensure that behaviours, underpinned by processes and management tools, are optimised, from 'quarry-to-lorry' across a cement producer's business. They go beyond simply optimising each cement plant at a local level, instead defining *how* each plant should be optimised uniformly across the group. Such approaches can target all areas of the

technical, financial, HR and environmental aspects of cement production. We work with the producer to identify where it is weak or strong in different areas, to improve a whole host of metrics relative to whatever baseline it deems appropriate.

The first TOMs Proudfoot implemented were at the largest producers. However, we now increasingly work with smaller and smaller producers. At the same time the complexity of TOMs is also increasing. They will gain only in importance in the future as the margins between success and failure in the cement sector become narrower.

As a next step, we now integrate TOMs with digitisation and changes to producers' IoT systems added on top. This really pins down those areas with fast payback. Remember, digitisation will not always bring benefits. Recently, a producer wanted to optimise fleet movements in the quarry. It was really looking forward to the savings but they did not materialise. There was so much information that it couldn't be processed to any real benefit.

GC: What comes afterwards, once a TOM has been successfully incorporated?

AM: We're still working on what comes next because TOMs are still in their infancy! They are a continuous process. First, they are designed and developed. Then they are assessed at a specific site or number of sites. Finally they are rolled out to different plants, usually over a multi-year timeframe. Only then can improvement begin. Once improvements have been made, the TOM should be refined further to drive further improvements and incorporate changing demands, for example CO₂ emissions and digitisation. The most advanced operators are now reaching this point. TOMs have a very long way to run: There will always be something new to add in to the mix.

GC: Do you think that cement producers will be able to run TOMs on their own in the future, with no input from Proudfoot?

AM: This is possible but it will depend on how the producer is structured internally. Some prefer to have central expertise and some prefer to take external advice. The smaller and regional firms, plus some multinationals, will need services like those supplied by Proudfoot well into the future. Some of the larger ones may well decide to replicate the function provided by Proudfoot in-house, as they have done with engineering arms in the past.

GC: Thank you for your time today.

AM: You are very welcome indeed!



Read more about TOMs in the June 2018 issue of Global Cement Magazine.