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## From Grey to Green to Red!

**Three major disruptions in the 21<sup>st</sup> century**

Stricter environmental regulation and the simultaneous arrival of digital technologies will trigger structural changes in construction modes and, therefore, in the building materials' supply and value chains in the next decade. These disruptions arrive at a time when cash-rich Chinese building materials leaders are expanding globally, following the lead of their contractors.

**Grey: CO2 regulations are reducing global supply**

Tighter regulations will trigger clinker supply rationalisation globally and generate better pricing. This is happening today in China where capacity closures and consolidation are pushing domestic prices higher. This is likely to happen in Europe by 2020, when CO2 allowances will drop dramatically.

**Green: Digitalisation will 'reshuffle the cards' across the value chain**

Building Information Modelling (BIM) is a revolution. It promotes more energy efficiency in construction, material productivity gains and greater transparency on pricing. Procurement decisions are shifting away from contractors and distributors. Greener construction will reduce demand for less energy efficient materials. In our view, a migration of the value across the supply chain is inevitable. Producers must rethink their portfolios to offer new value-added products and services to avoid commoditisation. Distributors must reinvent their business model to avoid being bypassed by e-commerce and new digital routes to market allowed by BIM.

**Red: New Chinese Leadership, new Chinese way**

A new Chinese leadership requires incumbents to redefine their strategy. Chinese contractors are leading the way to capture unprecedented infrastructure growth in One Belt One Road countries. They are bringing with them Chinese equipment and building materials suppliers. Anhui Conch focuses its international expansion on cement. CNBM, the world leader, is developing an integrated and BIM friendly model with a global B2B digital platform. CNBM has global ambition in cement/glass /plasterboard/insulation & prefabrication, both as a producer and equipment supplier.

**Consolidation ahead of us**

In 2020, we forecast that China will account for 75% of the USD45bn FCF generated by the world cement industry. Chinese firms can, therefore, consider larger deals/JVs with overseas producers as CO2 and digital disruptions create incentives to share risks on upstream production and restore ROCE in a cyclical industry. International building materials producers are deleveraging quickly and have the firepower to adapt their portfolios to those three disruptions.

***This report frames our medium-term view on the industry. Our sector arbitrage and scenario for 2019 is set out in a separate publication.***

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## EXECUTIVE SUMMARY

**“...It is not the strongest of the species that survives, nor the most intelligent that survives. It is the one that is the most adaptable to change...” — Charles Darwin (1809-1882)**

The recent and almost simultaneous decisions by **(1)** CRH, LafargeHolcim and Saint-Gobain to review their business portfolios, organization structure and/or to adopt more customer centric models, **(2)** the creation (thanks to e-commerce) by Argos and Cemex of new services and routes to market in ready-mixed concrete and **(3)** the statement made by HeidelbergCement during its recent CMD that concrete formulation is becoming critical for vertical integration, are evidence that the migration of the value across the supply chain is the new challenge for CEOs, created by three simultaneous disruptions: CO2 regulations, the digital revolution and Chinese leadership.

### **Three disruptions ahead of us: CO2 regulation, Digitalisation & Chinese leadership**

By 2050, the world population is predicted to reach 9.8bn and two out of three human beings will live in urban cities. This outlook translates into a strong need for housing and infrastructure.

However, this potential is obscuring a different reality as underlying challenges in productivity and sustainability could offset the growth momentum. An estimated ~ 40% of global CO2 emissions are generated by buildings, with the cement and glass industries representing 11% points of that total.

Growing cement/steel/glass demand would imply an increase in CO2 emissions in absolute terms (even if the efforts to reduce the CO2 footprint per tonne are visible). This is at a time when environmental issues (resource scarcity, climate change, carbon emissions...) are more critical than ever and need to be addressed by governments in a coordinated way (as discussed during the COP21 Conference in Paris).

Therefore, the enforcement of stricter regulations for CO2 emissions and the simultaneous arrival of digital technologies in construction (allowing greener building) are likely to trigger structural changes in construction modes and the building materials' value chain in the next decade.

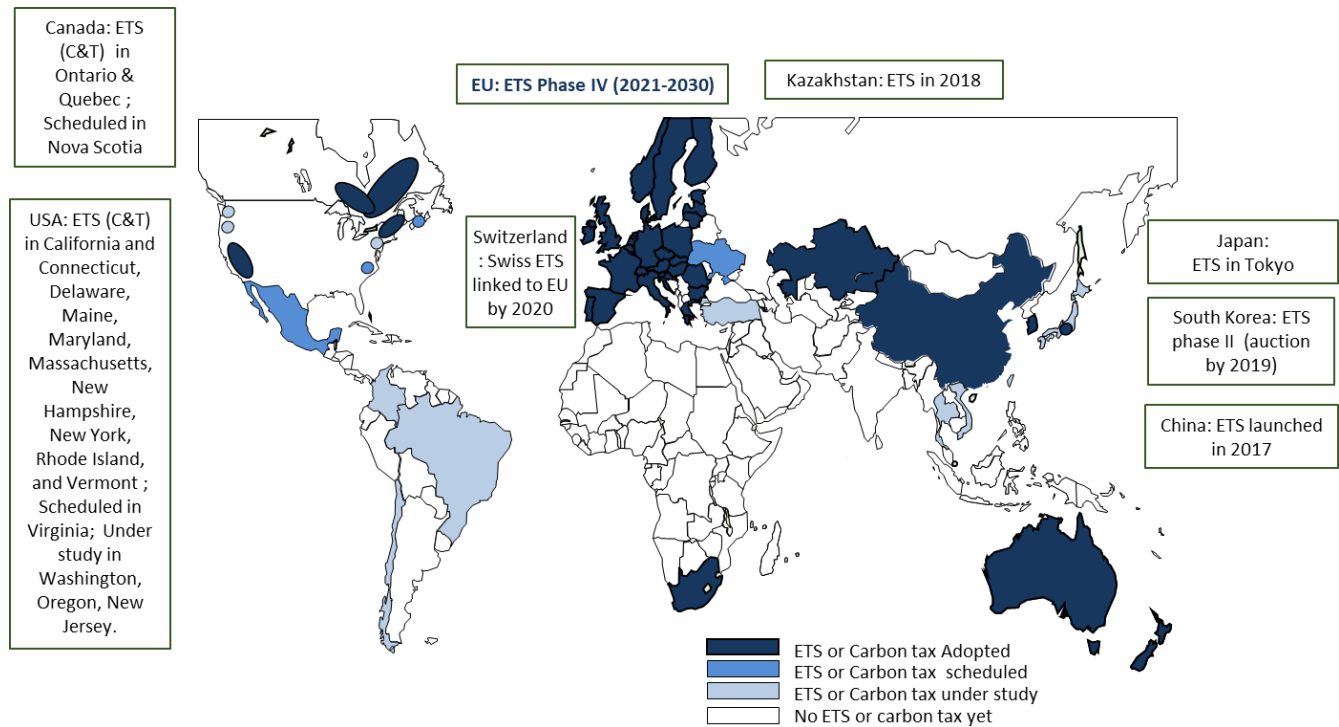
We see these trends as inevitable since economically viable substitutes to cement/concrete/steel/glass do not exist yet or cannot be mass produced to tackle the CO2 challenge.

We see three disruptions ahead of us

#### **GREY: 1<sup>st</sup> disruption: CO2 regulation**

Capacity closures forced by stricter CO2 regulations (COP 21 Paris agreement; ETS, carbon taxes...) and increasingly expensive CO2 allowances will change the global supply picture. This is at a time when demand continues to increase, thanks to the OBOR initiative (the Chinese Government intends to spend more than US\$1trillion on infrastructure spending in emerging markets) and due to stronger Indian growth.

**Exhibit 1: CO2 Emission Trading System (ETS) around the world in 2018**

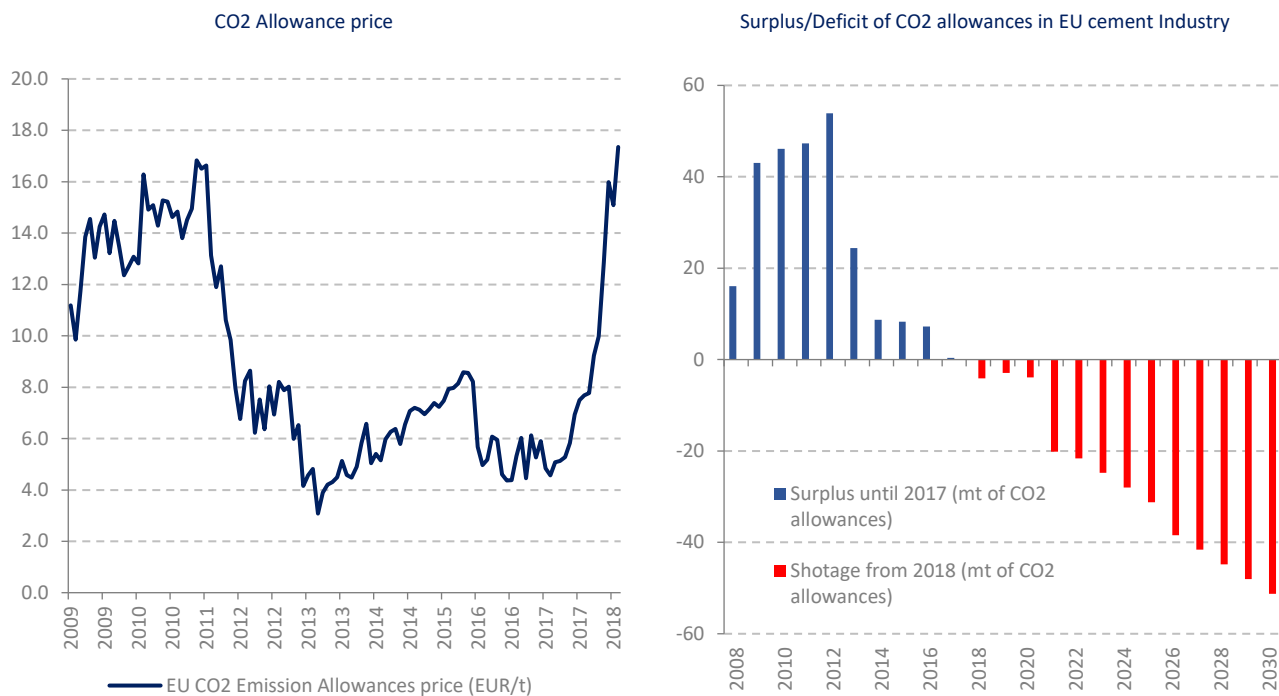


Sources: OFIR estimates, Sightline

China is switching from exports to imports following CO2 linked capacity closures and Europe will most likely follow the same pattern by 2020 given the planned reduction in allowances. As a result, we believe the global, movable surplus of cement will decrease in the next five years. The medium-term overall pricing environment should improve as a result, allowing CO2 cost inflation to be passed on to customers.

Following a +50% price increase in 2016-2018, we expect the Chinese cement retail price to continue to increase and reach US\$90-100/t by 2020 (from ~US\$65/t in 2018, or another ~ +40%).

**Exhibit 2: EU CO2 allowance price has tripled within the last 12 months**



Sources: OFIR estimates, Bloomberg

US prices could reach US\$130/t in our scenario by 2020 (from US\$120/t in 2018 or +5% p.a. just offsetting cost inflation). European prices should follow post 2020. Changes in seaborne cement trade flows will ease the pressure on African and South East Asian coastal markets where we see pricing overall stabilising.

We do, however, stress that these pricing changes are into 2020 and beyond and will not be all be achieved simultaneously. US prices have already largely recovered, large price hikes are underway in China, the timing of substantial European prices increases will depend on the pace of capacity closure to adapt to the new CO2 constraints.

### GREEN: 2nd disruption: Digital and BIM process

The digitalization of the construction and building materials industry, especially with the implementation of the digital Building Information Modelling (BIM) process, allows changes in construction modes that will tackle the CO2 challenge during the life time of a building.

Building Information Modelling (BIM) is a new method of collaborative work that brings together in a digital environment all the physical and functional characteristics of a project. With BIM, all construction stakeholders are fully involved to improve the performance and quality of buildings over their entire life cycle (Source Saint-Gobain). NB: BIM was created in the Aerospace industry and is also used by the Auto manufacturers.

The process will allow more energy efficient and longer lasting "green" building (i.e. less emissions). Therefore, we view its development and adoption as inevitable. Building Information Modelling (BIM) will allow decisions on materials selection and procurement, based on benchmarking obtained from digital data.

### We see several disruptions:

- A risk of commodization on the upstream (end of "cartel like behaviour")
- A reduced need for basic clinker/cement in volumes (and other materials with carbon content) over the long term
- Migration of the value across the supply chain towards the downstream. The key areas which we believe will be focussed on are:
  - 1) Vertical integration in aggregates, ready-mixed concrete, mortars and chemical additives
  - 2) Concrete modular prefabrication
  - 3) Insulation products and panels
- Changed business model: Heavy Building Materials producers will pursue more downstream activities and focus on proposing value added solutions rather than just commodities, more JVs/consolidation and potential more cement importing; Distributors are potentially by-passed and/or reduced more to a logistical role while it would appear there could be pressure from global specialized B2B platforms from China

### Exhibit 3: BIM is truly disruptive and revolutionary for the supply chain

	DESIGNER	FACILITY MANAGER/ USER	CONTRACTOR	BUILDING MATS	DISTRIBUTOR
	Main changes		Risks / Opportunities		
DIGITAL/ BIM DISRUPTION	<p>MORE ENERGY EFFICIENCY REQUESTS</p> <p>LIVE CALCULATION OF TOTAL PROJECT COST</p> <p>MORE PRODUCTIVITY REQUESTS</p> <p>BUILDING FOR A LONGER LIFE TIME (100 years)</p> <p>MORE FLEXIBILITY REQUESTS (Re-use the components)</p>	<p>MORE LEADERSHIP IN THE DECISION PROCESS</p> <p>EARLY INVOLVEMENT IN THE SUPPLY CHAIN, DESIGN AND MATERIALS SELECTION (green products favoured)</p> <p>MORE INFORMED DECISIONS ON PROCUREMENT COST BASED ON DATA OBTAINED WITH DIGITAL TOOLS</p> <p>DECISION TO REDUCE CARBON FOOTPRINT BASED ON ACCURATE MATERIALS BENCHMARKING OBTAINED WITH DIGITAL MEASURES / DATA</p>	<p>LESS DECISION POWER ON MATERIALS SELECTION</p> <p>PURE EXECUTION (no more design) IMPLIES LOW MARGIN</p> <p>TRANSPARENCY ON COST IMPLIES LESS ABILITY TO CAPTURE MARGIN</p> <p>MORE OFF-SITE CONSTRUCTION THAN ON-SITE</p>	<p>COMMODITISATION UPSTREAM</p> <p>LESS CONCRETE INTENSITY = less clinker volume</p> <p>LESS WASTED PRODUCT ON-SITE = less volume</p> <p>LESS PRODUCT WITH EMBODIED ENERGY (Asphalt/bitumen)</p> <p>NEED FOR VALUE ADDED ENERGY EFFICIENT SOLUTIONS (NEW PRICING POWER IS DOWNSTREAM)</p> <p>DIRECT SALES THROUGH NEW DIGITAL CHANNEL</p>	<p>DISTRIBUTION IS BY-PASSED BY MANUFACTURERS THROUGH DIRECT SALES TO FINAL CLIENT (digital data collection strategy)</p> <p>A PURE LOGISTIC ROLE FOR DISTRIBUTION (delivery /scheduling) AND LESS ADVISORY/ PRESCRIPTION (objects library)</p> <p>PRICING TRANSPARENCY DUE TO E-COMMERCE</p>
MIGRATION OF VALUE ACROSS THE SUPPLY CHAIN / NEW BUSINESS MODEL			<ul style="list-style-type: none"> <li>• BIM DESIGN-PROJECT OWNER</li> <li>• MODULAR STANDARDISED CONSTRUCTION AND INDUSTRIAL PREFABRICATION</li> <li>• 3D PRINTING SOFTWARE</li> <li>• INK PRODUCERS</li> </ul>	<ul style="list-style-type: none"> <li>• PLASTERBOARD</li> <li>• PREMIUM MORTARS</li> <li>• INSULATION</li> <li>• PRECAST CONCRETE</li> <li>• VALUE ADDED READY-MIXED CONCRETE FORMULATION.</li> <li>• CHEMICALS ADDITIVES</li> <li>• 3D PRINTING INK</li> </ul>	<ul style="list-style-type: none"> <li>• NEW SERVICES SOLD THROUGH A MORE CUSTOMER CENTRIC APPROACH</li> <li>• ONE STOP SHOP FULLY INTEGRATED MODEL ACROSS THE SUPPLY CHAIN</li> <li>• BIM PROJECTS OWNERSHIP (to decide on selection and prices)</li> </ul>

Sources: OFIR estimates

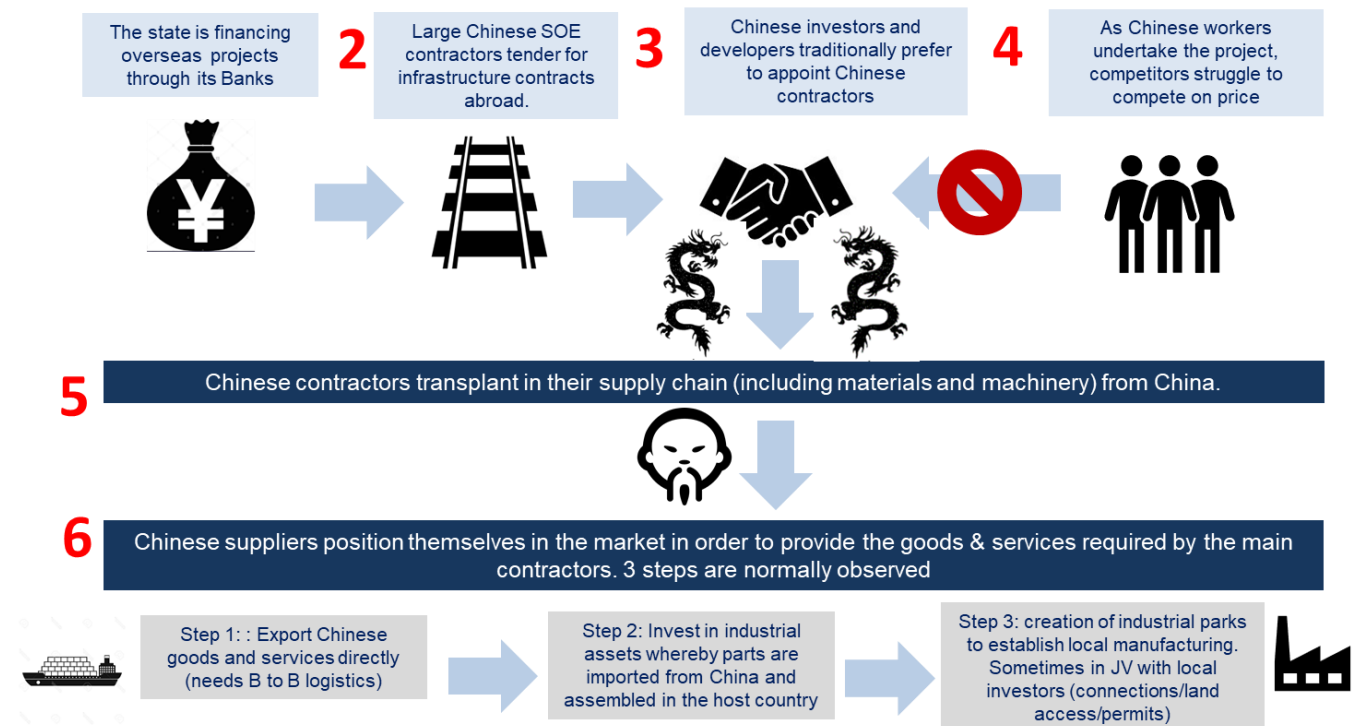
### RED: 3rd disruption: a new Chinese leadership for the industry

These important changes arrive at a time when cash-rich Chinese producers are becoming world leaders in building materials, and are searching for new growth areas along OBOR and even beyond

- **A change in leadership** is clearly taking place, not only in cement but progressively in other industries like glass and plasterboard where Chinese producers are expanding abroad to find new growth areas as domestic demand is fading. We expect the 21st century to 'belong' to the cash-rich Chinese producers.

- **The “Chinese way”.** Based on our analysis, we believe that Chinese contractors & developers are paving the way for manufacturers as they bring their own supply chain with them when winning tenders abroad or setting up projects. They favour Chinese suppliers and products exported from China – where possible/feasible - instead of buying locally manufactured products.

**Exhibit 4: The “Chinese way”: Chinese SOEs go abroad and bring their supply chains with them**



Sources: OFIR estimates, professional press, FLSmidth, Sinoma

### We don't expect a brutal immediate disruption... but inertia is suicide

-“...It's no longer the big beating the small, but the faster beating the slow...” quote from Mr Eric Pearson, CIO of International Hotel Group. The real danger in the building materials sector is that the Chinese firms can sometimes be both big and agile.

We don't expect a massive, immediate and brutal disruption for producers but more progressive significant changes over the next decade, creating threats and opportunities.

This is a main difference in comparison to the Automotive or Utilities industries (respectively 15% & 20% of world of CO2 emissions) as both sectors have been de-rated by investors as more CO2 friendly substitutes (electrical vehicles and renewable energies) have aggressively disrupted the incumbents

So, disruptions in the short term are more a cash allocation than cash generation challenge. But inertia is likely to translate into inferior growth and earnings momentum over the long term for the groups which are slow to adapt.

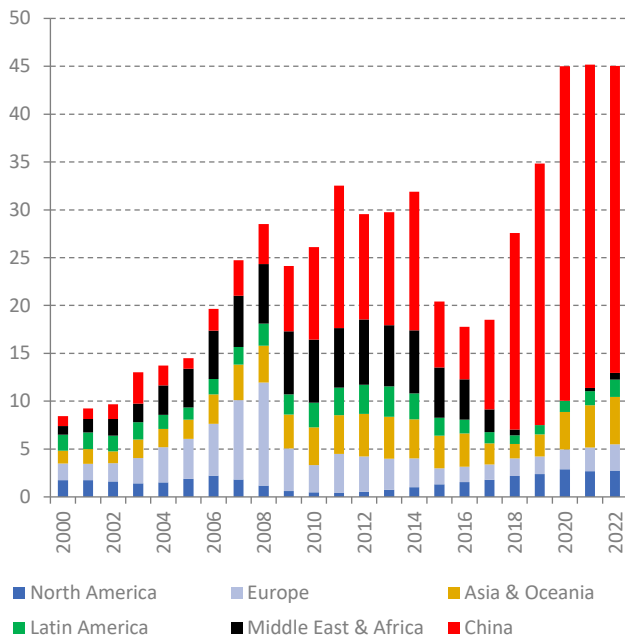
### Consolidation ahead of us

Contrary to the perception of many investors, the FCF generation of the global cement industry has never be so high (USD45bn in 2020, some 38% above the previous peak of 2011). In 2020, China will account for 75% of this USD45bn, with Anhui Conch & CNBM alone generating nearly USD10bn of this amount. It is likely that these new Chinese leaders will have appetite for M&A within the new framework set out above. The established incumbents will have to face this M&A potential, while also adapting to the new digital environment by repositioning their portfolios across the value chain.

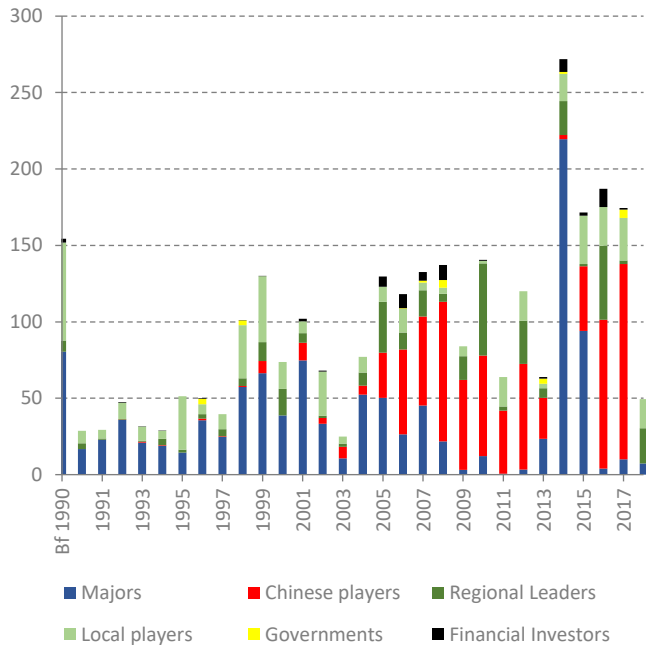
The Chinese can consider larger deals and JVs with Europeans (and others) as CO2 and digital disruptions create incentives to reduce and/or share risk on the upstream production to restore ROCE on capital intensive assets in a cyclical industry with fading long-term growth prospect.

**Exhibit 5: FCF generation of Chinese cement producers**

Global cement industry FCF (US\$m)



Cement M&A cycle  
(capacity change of ownership kt)



Sources: OFIR estimates



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