

constructsteel

Monthly update for the construction industry

June 2021



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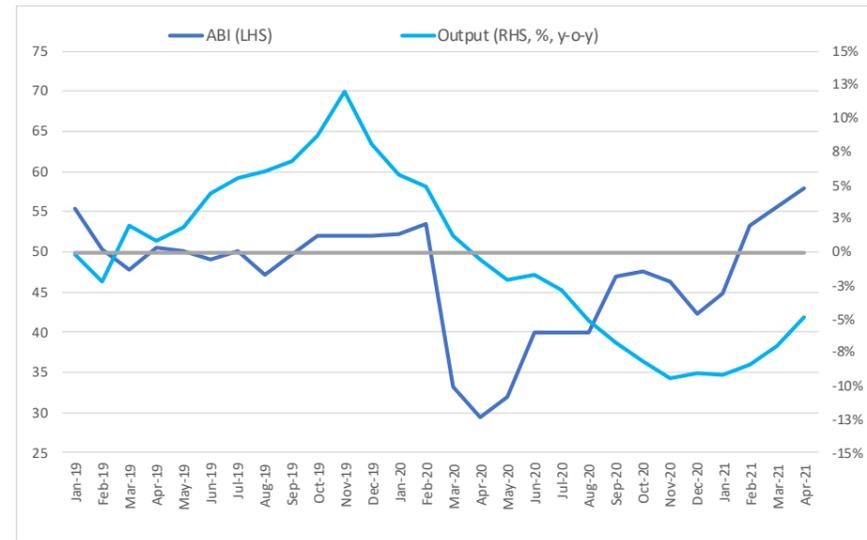
Construction market trends

United States Residential sector strong but building material shortages pose risks; private non-residential output continues to stabilise.

Residential building permits up 60% y-o-y in April; private residential output up 30% y-o-y, but single-family housing starts down -13% m-o-m due to construction material shortages. Private non-residential construction down by -0.5% m-o-m (-5% y-o-y). The Architecture Billings Index (ABI) expanded for the third month in April to 57.9 (> 50, expansion).

Private non-residential output vs ABI

Source: McKinsey & Company

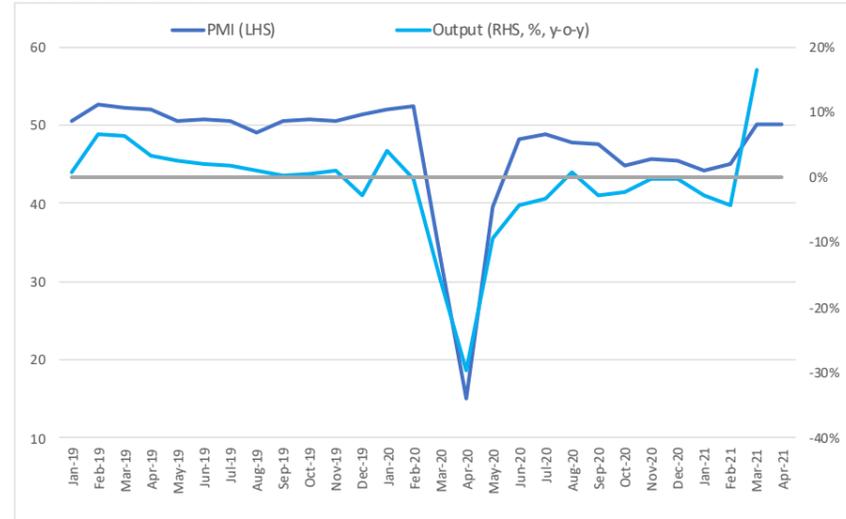


Europe Leading Indicators point towards stabilising activity in construction.

Eurozone construction up 2.7% m-o-m in March and 16% y-o-y due to the weak base in March 2020. The IHS Markit Eurozone Construction PMI remained unchanged at 50.1 in April (> 50, expansion) and indicating stabilising activity.

Eurozone construction output vs PMI

Source: Eurostat



Knowledge partner:



China Chinese real estate generally buoyant but indications of slowdown emerge in April.

Newly started floor space up 13% in April on a y-o-y, 3 month moving average basis. Floor space sold up 48% during the same period.

Floor space started (3 month moving average, %, y-o-y)

Source: McKinsey & Company

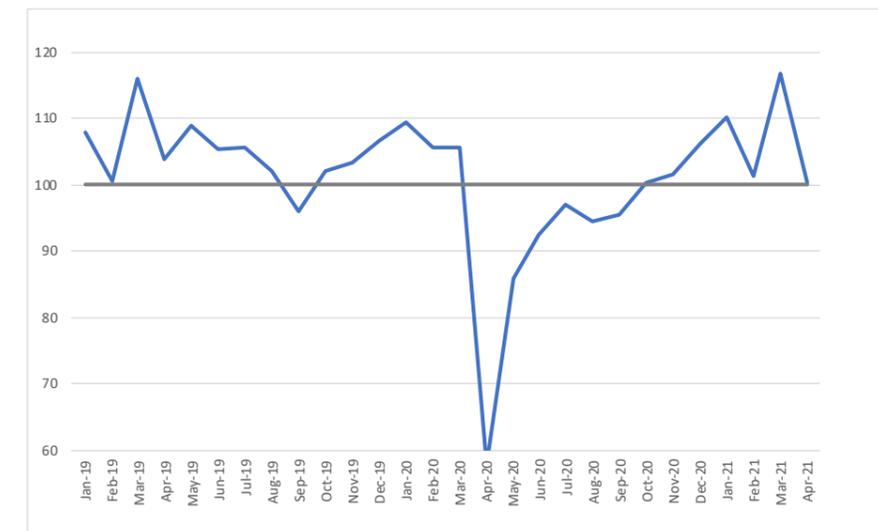


India Core sectors output saw strong growth in April due to weak base but demand conditions remain generally weak.

Growth in eight core sectors up by 56% y-o-y in April and mostly due to weak base of activity during April 2020.

Weighted average of eight core industries industrial production (% y-o-y)

Source: Ministry of Commerce & Industry, India



Special topic: Supporting the steel-concrete composite relationship in construction



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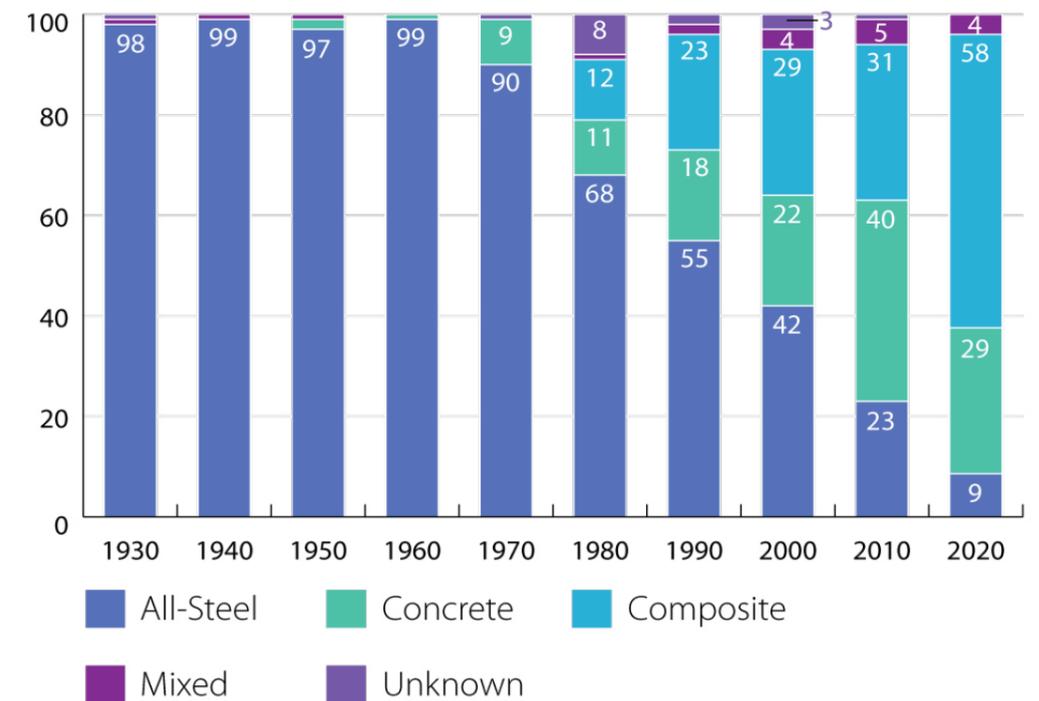


The Council on Tall Buildings and Urban Habitat (CTBUH) is the world's leading nonprofit organisation for all those interested in the future of cities. It explores how increased urban density and vertical growth can support more sustainable and healthy cities, especially in the face of mass urbanisation and the increasing effects of climate change worldwide. The relationship between policy, buildings, people, urban density, urban space, interior space, and infrastructure is key. Founded in the USA in 1969, with offices in Chicago, Shanghai and Venice, the Council runs hundreds of multidisciplinary programs across the world each year, through its regional chapters and expert committees.

constructsteel reached out to CTBUH to better understand how the properties of steel make it an optimal material in the construction of efficient, speedy, and sustainable tall buildings. Using tall building statistics from the CTBUH database, construction trends show that use of all-steel structural systems in tall buildings has been decreasing over the past few decades, in favour of concrete, and especially composite, construction (see Figure 1). The objective of an emerging research project from the Council, entitled "Composite Construction Systems: a Roadmap of the Research Needs to Improve Cost, Constructability, and Sustainable Performance," is to understand how the steel industry can better support market demand through an improved understanding of the possibilities offered by composite Steel/Concrete construction. The essential benefit of composite construction is that it synthesizes the best properties of both materials—for instance, steel has superior spanning and flexural capabilities, while concrete excels in compressive strength.

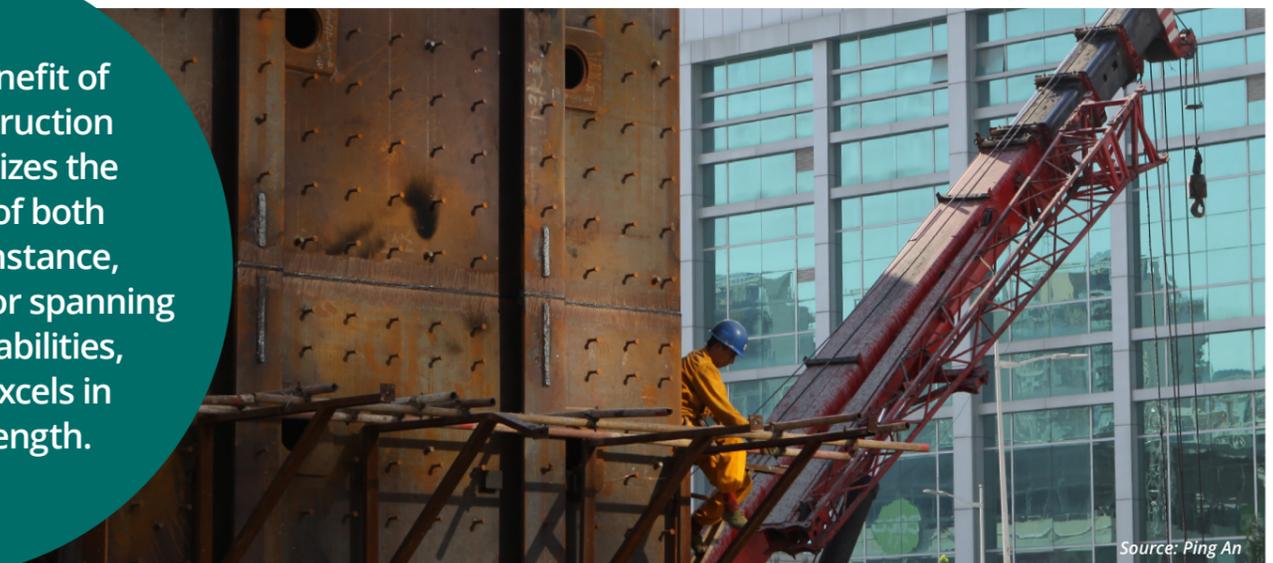
The behaviour of these composites can be considered at two scales: the scale of the building structure, and at the scale of each construction element. The first type—composite structures—are very popular but relatively simple; while the second type—composite elements—have infinite permutations, with many more currently being developed and tested globally. A tall building with a composite structure is a building where a combination of materials,

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such as steel and concrete, or concrete and timber, are used together to form the main structural elements. One example of this is a concrete core surrounded by a steel frame. The combination of two materials into a single element, where they work together at a smaller scale, is another type of composite. An example of this smaller scale is a column made with concrete-filled steel pipes or a flooring system made by fixing a concrete slab onto a steel beam.

CTBUH will conduct a survey on composite construction with stakeholders in order to identify the advantages and difficulties of construction using composite structures and elements. Simultaneously, CTBUH will review current research on composite elements and include scientific literature and interviews with leading researchers and industry representatives in the field. The scope of this nine-month research project is to ultimately create a roadmap to identify the most pressing research needs for the advancement of composite construction systems for buildings globally, and to evaluate the findings within the context of general research guidelines prescribed for leading tall building markets.





Technical trends:

Demand forecasting models for construction equipment OEMs

Automotive & Assembly Practice, McKinsey & Co

Demand-forecasting tools are becoming increasingly important as markets get disrupted and rapidly evolve. To thrive amidst these changes, Construction Equipment (CE) OEMs must be able to estimate future demand by using data-driven, analytical models that allow them to make rapid adjustments to production and supply chains. Improved demand-forecasting models drive benefits in multiple areas, including revenue generation, cost control, and capital optimization.

Using such models would represent a big change for many CE OEMs, since they have traditionally relied on forecasts that are based on experience and tribal knowledge. These methods have some benefits, but they lack the accuracy and insights that analytical, data-driven models can provide. While some CE OEMs have looked beyond experience and identified demand drivers, they have typically failed to determine which parameters have a meaningful impact on sales. Instead, they simply made judgment calls when planning for the future.

For best results, CE OEMs should transition to statistical models that rely on regression analysis to identify cause-and-effect relationships between sales and demand drivers.

These models, which have benefited from advances in machine learning and other technologies, can deliver highly accurate estimates. They also can be applied to massive, complex data sets to identify and learn patterns, even if the information is constantly changing.

Experience shows that advanced analytics can help companies identify the drivers that truly predict CE demand, as well as the strength of the relationship between each driver and sales. But there are multiple potential drivers, and many CE OEMs lack the capabilities or capacity required to determine the most pertinent ones and perform sophisticated analytics. To assist them, McKinsey investigated various models. It first identified the various drivers of demand for CE sales, such as GDP, gross value added (GVA) in construction, construction capital expenditures (capex), and residential housing starts. McKinsey then looked at historical data from 2002 to determine which parameters were most strongly correlated with CE sales across business cycles.

McKinsey found that most individual demand drivers were correlated with CE sales, but the strength of the relationship varied. For example, the correlation was

stronger for construction capex than GDP. No single driver had a correlation with CE sales that was powerful enough to be statistically significant. In consequence, McKinsey modeled various permutations based on different combinations of drivers. As a result, the combination of construction capex and residential housing starts was highly correlated with CE sales. After interviewing industry experts, McKinsey also determined that the correlation was even stronger when inventory correction was also factored in. Within the CE industry, inventory correction is typically seen at the beginning or end of the business cycle. If dealers expect sales to rise, they may get overly enthusiastic and build up inventory to a greater extent than needed. If they anticipate a downturn in sales, they may get nervous and liquidate inventory more than needed.

Construction capex

Construction capex includes investments in new builds and projects, as well as repair and maintenance work in the construction sector, both of which drive demand for construction equipment. This metric is closely correlated with GDP growth, which has been increasing in the key CE markets of Europe and the United States over the past six years.

Housing starts

Residential construction is the second main driver of CE sales, especially for smaller equipment such as mini excavators, skid-steer loaders, and backhoe loaders. Housing starts—the number of new residential construction projects that begin during any particular month—serve as a key indicator for growth in this sector. A housing start is counted when construction begins on the footers or foundations of a residential structure. This metric offers a good estimate of construction-machinery use, which is a strong indicator of both replacement and new machine demand.

Inventory corrections

McKinsey also considered inventory corrections in the model, since dealers build inventory when an up cycle is beginning and liquidate when difficult times commence. Product-mix changes related to market fluctuations were also considered. Inventory corrections usually occur whenever a market has been growing for a few years, and the industry expects a cyclical downturn. Such corrections typically occur when the market sees three years of continuous growth.

Model outputs

McKinsey found that CE OEMs can predict long-term market demand with decent accuracy by using models that consider construction capex, residential housing starts, and inventory correction in combination. The output of these models tracked more closely with actual results than did models that used one or two of these variables, or just GVA, when compared with demand for CE for the years from 2002 through 2019 in the United States (Exhibit 1); the same held true for Europe over the same period (Exhibit 2). When paired with market intelligence from customers, dealers, and sales teams, such models can also help estimate in-year and medium-term demand.

Exhibit 1: The model that combined three demand drivers most accurately reflected demand for construction equipment in the United States.

Units, normal to 2002 (= 143,755)

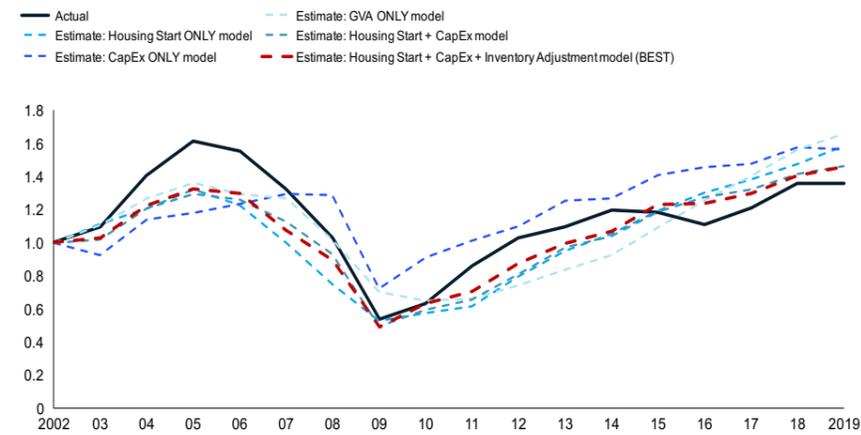
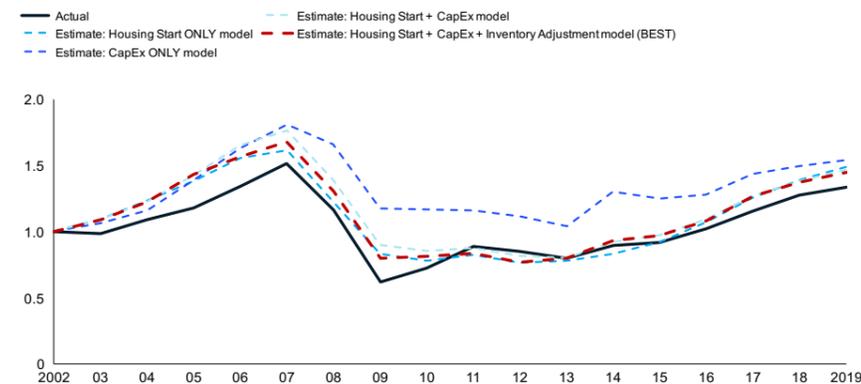


Exhibit 2: The model that combined three demand drivers most accurately reflected demand for construction equipment in Europe from 2002 through 2019.

Units, normal to 2002 (= 140,344)



Application of the demand models

As the global economy recovers from the economic effects of the COVID-19 pandemic, market growth will vary by country, with some beginning to improve earlier than others. Regardless of location, CE OEMs across the value chain can use demand-driver models to achieve important benefits, including the following:

- **Revenue enhancement.** CE OEMs can use models to pressure test sales plans and set the right expectations, as well as to modulate production to avoid running out of stock in up cycles and excess inventory in down cycles. Models can also further enhance their ability to manage product mix proactively when capacity is constrained.
- **Cost control.** Driver-based models can help CE OEMs determine whether forward-buying of materials is necessary to mitigate inflationary risks. They can also assist with capacity planning, resulting in fewer rush orders and lower freight costs.
- **Capital optimization.** With more accurate forecasting, CE OEMs will have the right finished-goods inventory at the right place and right time, avoiding both stock buildup and obsolescence. CE OEMs will also be able to right-size supply inventory and safety stocks.

Analytical, demand-driver-based models can also be applied at the state and regional level. In addition to CE OEMs, other stakeholders across the value chain can deploy them. For instance, suppliers can apply them when formulating strategic plans and determining where to invest in capacity. Similarly, dealers could use the models when considering how to scale their inventories up or down, or when developing sales strategies and capabilities. For investors, demand-driver-based models can help as they pressure test their investment thesis on assets. Of course, any outputs from demand-driver-based models should be triangulated with market intelligence, including input from dealers, customers, field sales, and industry experts.



Construction steel news headlines

construction market and regulations

Dubai's real estate market continues to achieve record numbers in the number and value of real estate sales transactions, thus enhancing the emirate's global position as a preferred real estate investment destination. 4,832 sales transactions worth AED 10.98 billion were recorded in April 2021, the highest value in four years, specifically since March 2017. [Link](#) Real estate sector recovery is also expected to prompt major infrastructure schemes considered before the pandemic to move forward as PPPs, requiring international finance and delivery teams. [Link](#)

Representatives from the UK's Centre for Digital Built Britain (CDBB) will work with the US National Institute of Building Sciences (NIBS) to help the US develop its own national Building Information Modelling (BIM) programme. NIBS will work with CDBB to adapt the UK programme model and materials as a guide to developing a US national roadmap aligned with the international standard for BIM- ISO19650. [Link](#)

The construction industry in Australia is expected to grow by 2.2% in 2021, with the government's focus on infrastructure investment playing a key role in reviving the country's economy. In mid-June 2020, the government announced that 15 infrastructure projects worth approximately US\$55 billion would be fast-tracked. Federal, state and territory governments have also reached an agreement to cut approval time for infrastructure projects by half. [Link](#)

The UK construction industry is experiencing its fastest rate of growth for over six years. The IHS

Markit Construction PMI Total Activity Index reached 61.6 in April, down only fractionally from March's six-and-a-half year peak of 61.7 (any figure above 50.0 indicates an overall expansion of construction output). It is the commercial work that is driving the industry's resurgence – the segment achieved a PMI Index score of 62.2, while civil engineering had a PMI Index of 61.5 and is currently growing at its fastest rate since 2014. [Link](#)

The European Academies Science Advisory Council (EASAC) has published a report highlighting the need for an urgent review of construction methods and materials. In Decarbonisation of Buildings: for Climate, Health and Jobs, EASAC urges EU policymakers to take action to ensure the reduction of embodied carbon in both the construction and renovation of buildings. [Link](#)

Global construction equipment sales were stronger in 2020 than had previously been forecast, due to the spending stimulus implemented by China as a reaction to the pandemic and construction work being deemed 'essential' in large parts of the world. The overall decline was expected to be approximately 5%, however, the market grew from already buoyant levels of 2019 by a further 30%. [Link](#)

Nigeria's construction industry is due to grow by 3.9% in 2021 after a 7.7% decline in 2020. The fall was caused by Covid-19 restrictions and a drop in demand for oil and gas, which accounts for 65% of government revenues. Nigeria's construction market is due to increase 3.2% annually between 2022 and 2025, supported by state investment in the infrastructure and energy sector. [Link](#)

construction materials

US President Joe Biden has pledged to tackle construction material shortages that contractors say are driving up unrecoverable costs and causing project delays. Looking at specific product categories, between April 2020 and April 2021, producer price indices have risen as follows: lumber and plywood – 85.7%; steel mill products – 67%; copper and brass mill shapes – 49%; aluminium mill shapes – 20.5%; plastic construction products – 14.2%; gypsum products – 12.1%. [Link](#)

Chinese builders have slowed purchases of steel-based materials after prices soared to record highs, but the top steel-consuming construction sector is expected to remain well supported until the rainy season slows activity from June. The most-traded contracts for construction-grade steel rebar and wire rod on the Shanghai Futures Exchange have surged close to 40% this year, and over 20% since April 1, amid a stimulus-driven building boom that has helped lift the Chinese economy since late 2020. [Link](#)

Construction and civil engineering company BAM Nuttall has successfully completed the UK's largest single pour of a new cement-free concrete. The 300 cubic-metre continuous pour, which supports the foundation for a new step-free access at a railway station in Kent, UK, is the first use of the product, Cemfree, on UK rail network. Production of Cemfree reduces carbon emissions by up to 80% in comparison to traditional cement-based concrete. [Link](#)

Russia's industry ministry has held preliminary discussions with metals producers about buying their products for the state stockpile. Moscow has been keeping a close eye on rising raw materials costs in the construction sector as part of efforts to keep domestic commodity prices stable even as they rise at the global level. The government raised taxes for metals companies in 2020. [Link](#)

construction sector players

The modular construction startup Katterra is shutting down – the company plans to cut thousands of jobs and may end up walking away from construction jobs it was contracted to build. Company executive cited the Covid-19 pandemic, along with soaring labor and construction costs as reasons for its latest financial difficulties, however the company's record of delivering on its projects has been patchy, and the company struggled with delays and cost overruns. [Link](#)

Gulf Development International has unveiled plans to build what is billed as one of the largest volumetric modular assembly plants in the world. The project will take shape within Saudi Arabia's \$500bn Neom city. The \$1bn factory project is expected to come up on a 1.4m sqm site in Neom. Once the facility is operational, it will be capable of producing up to 12,500 modular units per year. [Link](#)

Global technology giant ABB has announced a formal move into the construction industry. The Zurich-based technology company aims to drive the uptake of automation and robotics in a construction industry – ABB currently has robotic equipment operating on a number of pilot projects,

including the production of prefabricated modular homes, a project which it says has increased in efficiency by 15%. [Link](#)

Construction management software company Procore Technologies has acquired INDUS.AI, makers of an artificial intelligence-powered analytics platform for the construction industry, for an undisclosed amount. This move adds computer vision capabilities to the Procore platform, which the company says will help contractors realise greater efficiencies, safety, and profitability. [Link](#)

Builders' merchant group Travis Perkins has agreed the sale of its plumbing & heating distribution business to a private equity firm for £325 million. Alongside the recent demerger of Wickes, the DIY hardware chain, the sale of P&H represents the completion of Travis Perkins' restructuring that has been planned since December 2018. [Link](#)

HeidelbergCement, the world's second-largest cement maker, plans to turn its Swedish factory in Slite into the world's first CO2-neutral cement plant by 2030 via carbon capture technology. Following the planned retrofit, which will cost at least \$122 million, the plant will be able to capture up to 1.8 million tonnes of carbon dioxide per year, which corresponds to the site's total emissions. [Link](#)

Bam Construct is considering a shift into the residential market with a modular offering. The contractor is looking at how it could capitalise on what it expects to be strong, long-term demand in the residential market. At this stage it is considering working with the public sector and housing associations as well as potentially alongside private developers. The firm

has traditionally focused on commercial and public sector building projects. [Link](#)

Kenoteq has been awarded almost €1.2 million in funding from Zero Waste Scotland, to scale up production of its eco-friendly K-Briq. The start-up company, spun out from Edinburgh's Heriot-Watt University, says the award – part of Scotland's Circular Economy Investment Fund – will allow it to produce more than two million bricks a year. The K-Briq is made from more than 90% recycled demolition and construction waste material, while its manufacturing process produces just 10% of the CO2 emissions of traditionally-fired bricks and requires 10% of the energy. [Link](#)



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