

constructsteel

Monthly update for the construction industry

March 2021



constructsteel

constructsteel update



Terrence Busuttil
Head, constructsteel

Dear reader,

I'd like to start off by taking the opportunity to thank our members and partners for their continuous support to the constructsteel market development programme. Since its official launch in January 2021, I am happy to share that 14 steel producing members of worldsteel have joined us. This, to me, indicates two trends: first, that positioning steel in construction is increasingly becoming a priority for steel producers worldwide. Secondly, steel construction promotion requires a global approach that supports activities locally, at the country level.

Positioning steel in construction cannot be done by the steel industry alone. In addition to the steel producers who are already members of constructsteel, membership is open to partners, customers and stakeholders across the construction chain. Currently, we are in discussions with a large player in the plasterboard and glass sector, as well as with several steel construction associations to join constructsteel. This is testament to the importance of a global approach to the promotion of steel construction.

Recently, and as a result of constructsteel's first member meeting, we concluded that the promotion of steel in construction requires a two-pronged approach. The first one is the creation of dedicated segment focused working groups which position steel via technical research and marketing campaigns. Secondly, expanding the steel construction ecosystem will be complementary to our working group activity. Here is an overview of the dedicated working groups.

Dedicated working groups & goals

Steel Bridges – To produce a Best Practice Guide focusing on key unique selling propositions of steel in both aged and new bridges.

Modular construction – To produce a report focusing on research areas needed to increase the use of steel in medium rise buildings.

Composite construction – Research into gaps to support composite steel beam and precast concrete slab and steel/timber hybrid designs.

Life Cycle Assessment (LCA) – Research into making the case for steel over the whole life cycle vis a vis competing materials e.g. [roofing study](#)

Zero Energy Buildings (ZEBs) – Design of a circular prototype two storey net zero carbon affordable house in collaboration with [Gensler](#).

Expanding our steel construction ecosystem

Through our defined working groups, we will communicate our efforts globally, promoting our activities via our website and social media channels, acting as the amplifying voice of our members. In addition to our digital channels, we will actively pursue networking opportunities at global and regional levels as means of bringing the construction industry together, sharing ideas and best practices.

As part of this global approach, this monthly newsletter provides an overview of steel construction developments and expert insights, focusing on upcoming trends likely to impact the construction industry and how the steel industry can better serve the construction industry. We hope you find this content useful and invite you to subscribe to our newsletter and follow our social media channels to stay informed of all constructsteel activities.



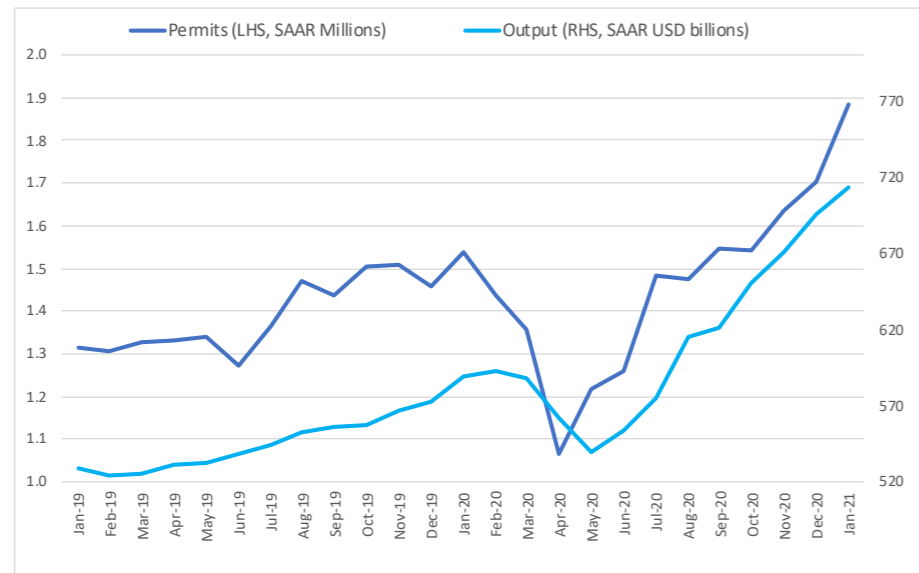
Construction market trends

United States Private residential construction remains strong; private non-residential output indicates tentative signs of stabilisation.

Private residential construction output up 21% y-o-y increase in January with housing permits increasing at a similar rate.

Private residential output vs private permits

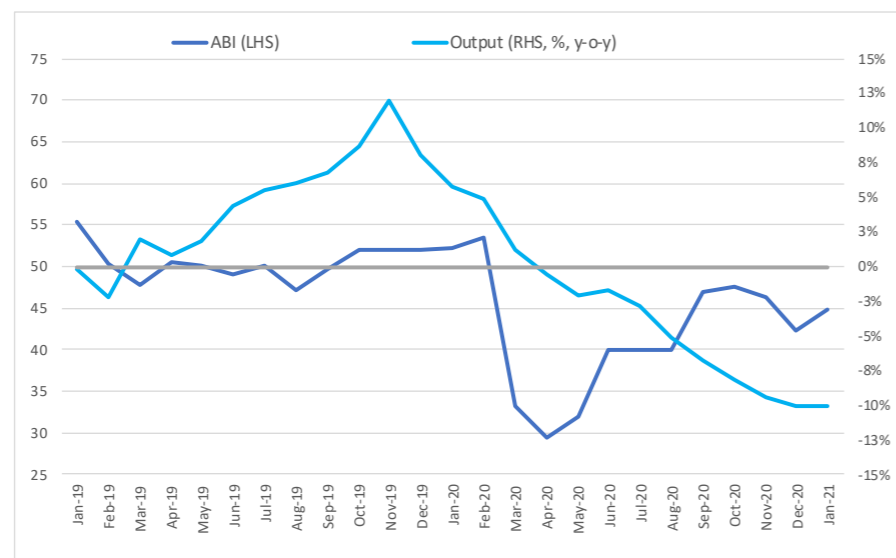
Source: McKinsey & Company



Private non-residential construction output fell -10% y-o-y in January but edged up 0.4% m-o-m and for the first time since June 2020. The Architecture Billings Index (ABI) improved slightly to 44.9 (< 50, contraction).

Private non-residential output vs Architecture Billings Index (ABI)

Source: McKinsey & Company



Knowledge partner:

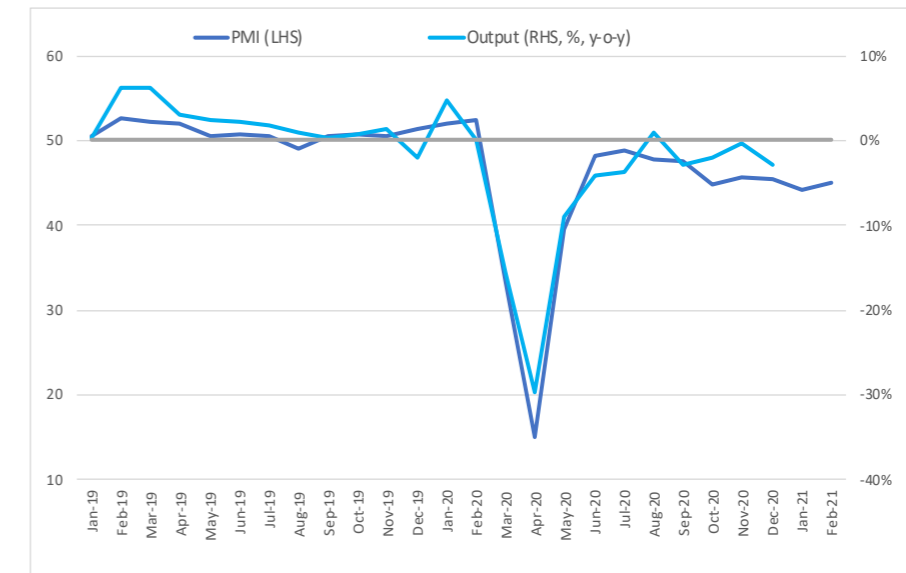


Europe Construction output weak with no recovery expected before H2 2021.

Eurozone construction output fell -3% y-o-y in December. The IHS Markit Eurozone Construction PMI remained negative in February and at 45.9 (<50, contraction).

Eurozone construction output vs PMI

Source: Eurostat

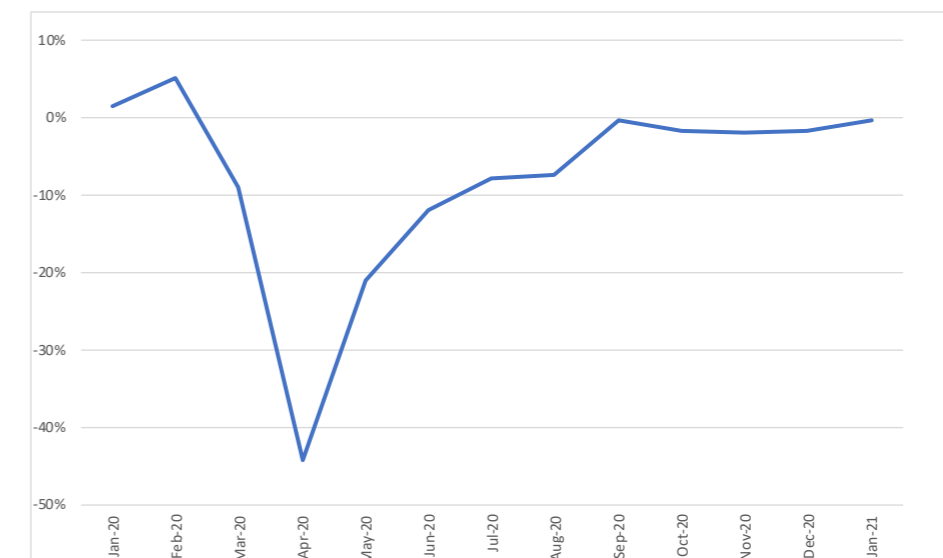


India Decline in industrial production slowing, boding well for a pickup in activity in H2 2021.

The weighted average of eight core industries output increased marginally and by 0.1% y-o-y in January with positive contribution from fertilizers, steel and electricity production.

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

Source: Ministry of Commerce & Industry, India



How digital and analytics can unlock full potential in steel Metals & Mining Practice, McKinsey & Co



images.worldsteel.org

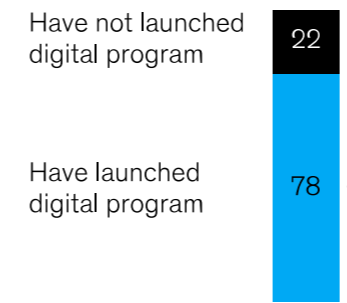
Metals manufacturing companies have been successful in achieving impact at scale from digital and analytics. This was recently highlighted when the World Economic Forum selected four steel players (BaoSteel China, POSCO South Korea, TATA Steel India, TATA Steel Netherlands) as Industry 4.0 Lighthouses among a total of over 50 organizations across all industries.

To better understand what the metals industry is doing to capture the digital opportunity, McKinsey surveyed over 30 leading metals companies across the world on their digital and analytics journey (Exhibit 1)

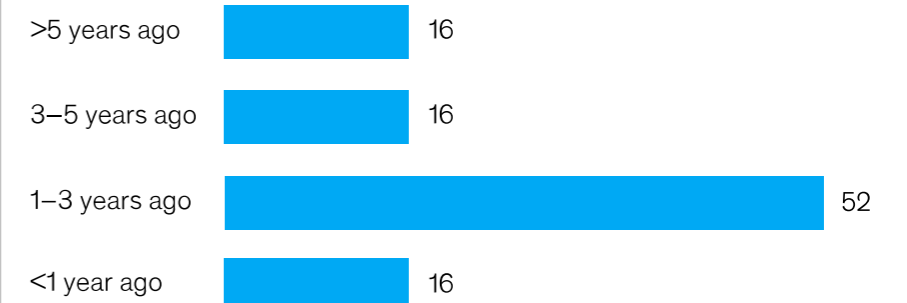
The majority of surveyed metals players have a digital program running and see it as top strategic priority.

% of respondents

Multi-year digital program



Launch date of the digital program, %



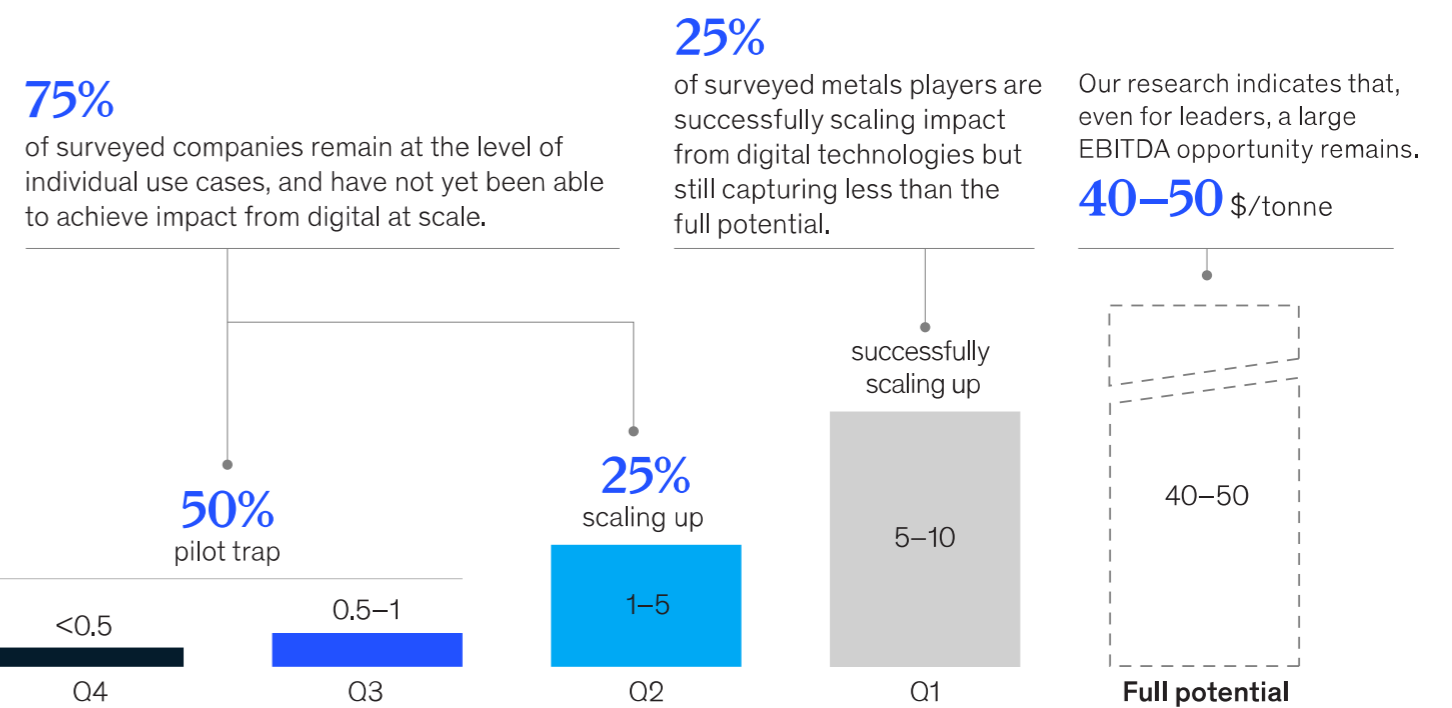
82%

of metals players see digital as top priority in their strategy

The survey indicates that, although the majority of players have already rolled out digital and analytics programs over the past few years and started to generate impact, a lot of potential still remains untapped (Exhibit 2). McKinsey research shows that there are five main success factors to scale digital and analytics: set bold targets and strategies; invest; set up a flexible data and tech architecture; build skill sets; and set up the right governance behind data and analytics programs.

We observe a big disparity in realized impact and significant potential remains untapped for steel companies.

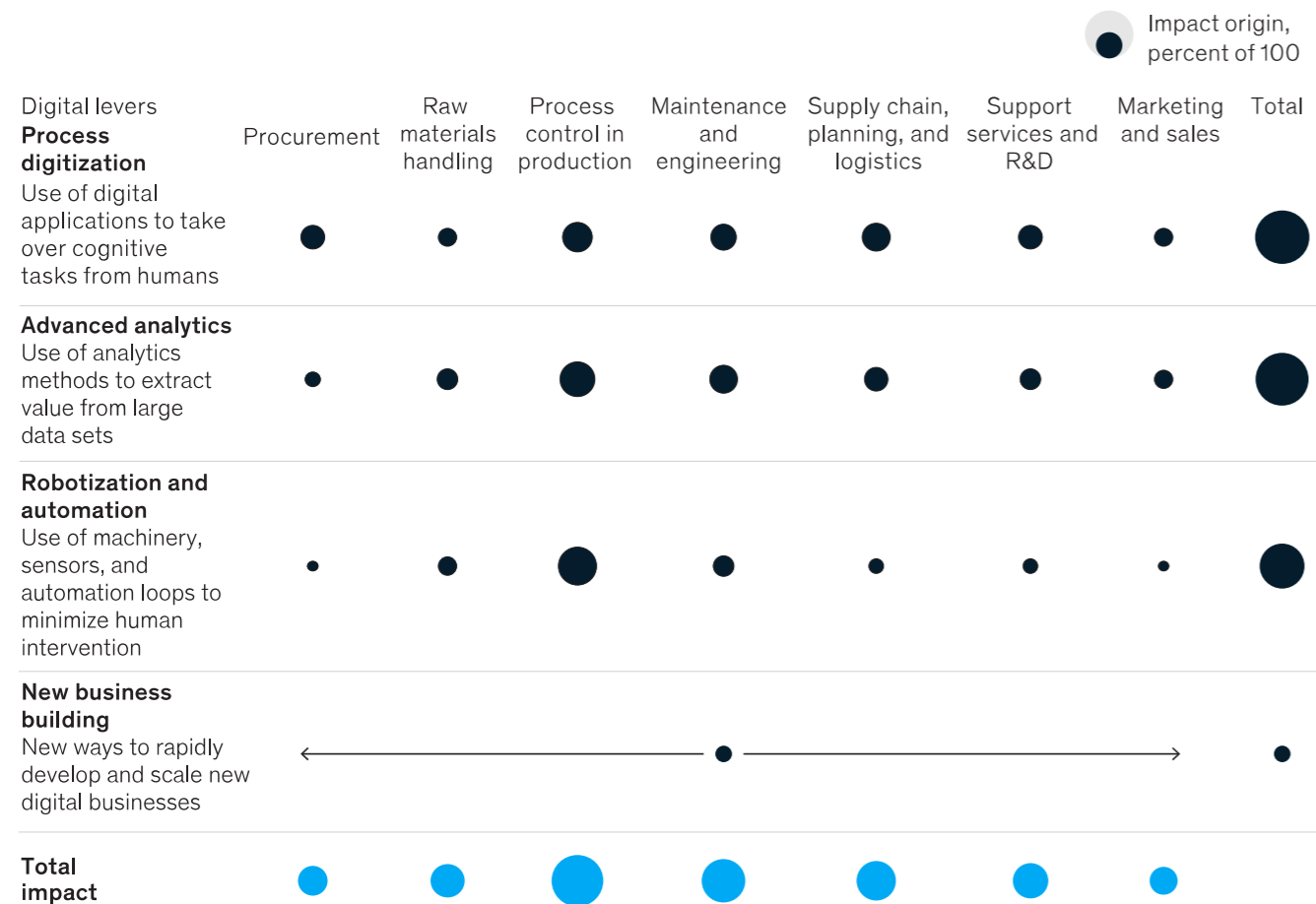
EBITDA uplift from digital and analytics, \$/tonne, steel companies only



Steel companies grouped per quartile and ranked from lowest to highest realized impact.

The survey indicates that process digitization, advanced analytics, and robotization and automation are emerging as the biggest opportunities for impact, whereas new business building has had limited application until now (Exhibit 3). Though all the steel companies realized value across the value chain, most of them drew significant impact from process control in production/manufacturing as well as maintenance and engineering areas.

Metals players are capturing opportunities primarily across three digital levers and along the full value chain.

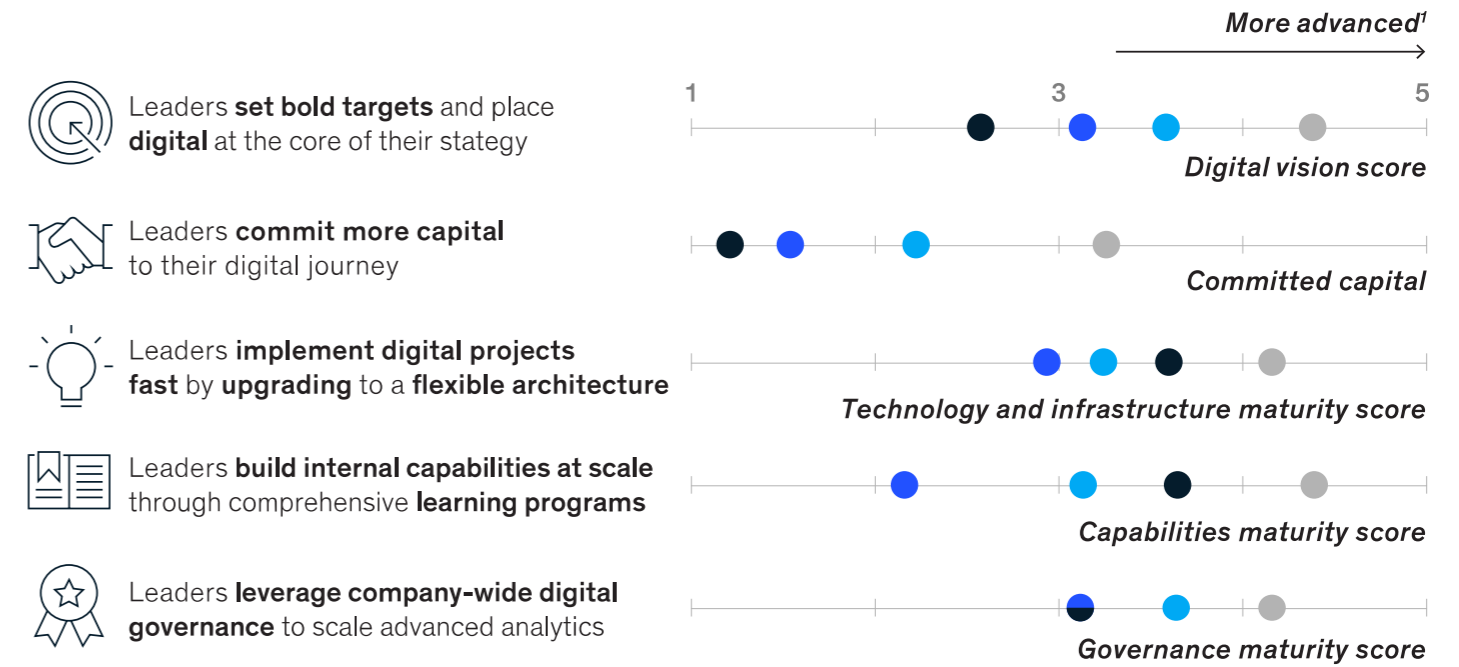


As per McKinsey research, robotization and automation is creating value where impact originates from new next-generation sensors and better process control loops. The players that have invested in automating their process control system have made significant gains in yield and quality improvement, reducing their overall energy consumption and maximizing throughput.

The survey clearly highlights the unprecedented impact from digital and analytics application in steel that traditional approaches could never achieve. According to McKinsey, companies that successfully harness the potential of digital will be the first to capture breakthrough increases in top-line revenues, capture the next 10–15 percent of cost improvement, and leapfrog ahead of the rest of the industry. However, digital transformations can fail easily ... Most of them get stuck in the digital use case “pilot trap” as they focus on deploying digital use cases (Exhibit 5). To prove successful, digital transformation should take into account three key areas: business, organization, and technology, as well as return-on-investment payback mindset with CxO attention and sponsorship.

Digital leaders share a common set of enabling characteristics.

● Q4 ● Q3 ● Q2 ● Digital Leaders (Q1)



Setting **ambitious long-term targets** enables metals players to also accelerate short-term values capture from digital and analytics.

All leaders claim that they “**put digital at the core of their strategy and position as firstmover**” vs peers who “do not have a documented digital strategy or follow competitors.”

¹Pilot trap deemed as 3rd and 4th quartile.

Top five themes that companies in the pilot trap¹ group would do differently to scale up digital.²



Companies that fell behind indicate they would have done two things differently:

Set clear digital vision
An impactful digital transformation is a process that requires a long-term strategy

Focus more on the development of digital capabilities
The survey suggests players that train employees at scale in digital and analytics tend to capture more value

Note: Responses do not add up to 100%

¹Pilot trap deemed as 3rd and 4th quartile.

²Out of a long list of components not all mentioned here (eg, build external ecosystem, agile way of working, develop buy-in from business, continuous pipeline of use cases, active change management, etc).

Technical trends: Sustainable construction – modular and light systems

Matthew Woodley,
Chief Operating Officer,
FRAMECAD



What construction trends have emerged from the global pandemic – and which do you see sticking around?

We're seeing a global trend towards more systemization and digitization of the construction process, from design, right through to track-and-trace manufacturing, assembly, and construction either onsite or offsite. Although that trend started long before COVID hit, we've certainly seen a speeding-up of adoption in the last year.

There's been a greater requirement for digital information sharing with different suppliers and contractors, mostly due to limits placed on the number of people who can be onsite at any time. A challenge with any large project is communicating changes and ensuring that they are carried out throughout the project without confusion or double-ups. We've worked to ensure that FRAMECAD software integrates seamlessly with BIM models, sharing all information digitally back into the master model of the building. If someone makes a change in the model, that information gets shared directly back to the FRAMECAD design software (and vice versa).

Although COVID has sped up the adoption of such technologies, this faster rate of adoption is likely to stick around because of the efficiencies gained. The BIM environment working seamlessly with FRAMECAD digital design, manufacturing, and construction phase component tracking means changes are easier to make, everyone can be kept informed of progress, and with fewer errors made.

There's also been an acceleration in the move towards being more design-led. COVID has driven a construction environment with fewer people onsite at any one time and increasing costs to get materials to site. Builders want to ensure that they have considered every aspect of the project in advance to ensure everything runs smoothly and the most coordinated manner onsite. Because FRAMECAD is a design-led system that flows from architectural design through the engineering and detailed design stage to manufacture, we've seen those trends first-hand.

Full volumetric prefabrication and sub-assembly offsite is in a significant growth phase. For example, there is a big move for internal partitioning which used to largely be constructed with skilled artisan labor on site or manually fabricated offsite to an offsite automated process.

At FRAMECAD, we're seeing more of the Industry pick up our design and manufacturing technology to automate that process – reducing the amount of waste, cutting down time spent in prefabrication, improving the quality of component parts, enjoying a much higher degree of digital design collaboration with their customers and speeding up the entire production process.

How do you see the construction industry becoming more sustainable? What role do light systems have to play?

The impact that climate change is having (and will have) on our world is a much-discussed topic. There is a lot of great initiatives actively adopted in the construction industry to ensure a lighter industry footprint on the environment. But it is an ongoing process of improvement and as an industry we know we can do more.

By way of example, we're starting to see a genuine shift from both the industry and from end users to make buildings more energy efficient. That includes a lot of effort going into subassembly wall and roof systems that are cooler in the day and warmer in the evenings, methods for reducing direct sunlight into the building, double-glazing on windows and doors to reduce heat transfer, more energy efficient air conditioning systems, and solar energy systems. Even paint colors that are more reflective and don't absorb as much heat are being adopted more consciously in the design and construction of new buildings.

At FRAMECAD, we see enabling the use of those materials as part of our responsibility, so have built assembly solutions to meet and exceed thermal codes, sound transmission, and fire codes into our system. We're collaborating with materials manufacturers such as cladding manufacturers, dry wall suppliers, and insulation providers to ensure those systems are robust, available locally and certified. Although our system produces the frames of a building, we know that it's not just the performance of the frame that matters – it's equally important how that frame works with other construction materials provide the most sustainable building. We're seeing an increased uptake in systems such as dry construction methods that use less precious resources like water and produce fewer toxins throughout the construction process and the lifecycle.

Additionally, more and more businesses are turning to systems which require less transportation, so that the carbon footprint of getting materials onsite is reduced. Additionally, they're looking for systems that require less craning and machinery on site to further reduce carbon emissions with the added benefit of significant cost savings. That's where cold formed steel really shines. Cold formed steel construction systems are going to be vital in achieving a more sustainable construction industry for a number of reasons. Firstly, they are very durable, so they won't deteriorate as quickly. Secondly, steel is a 100% recyclable product, so if a building does have to be taken down, the materials can be recycled almost endlessly.

We've seen fantastic applications of light systems over the COVID period for temporary buildings or where tight timeframes meant other methods couldn't deliver. Projects such as COVID testing stations and field hospitals have been erected using light gauge steel frames manufactured through the FRAMECAD system. The added benefit is that if they need to be removed at a later date, they can be; instead of being demolished and sent to landfill, they can just remove the cladding and lining, then

take it all down – either to be re-erected somewhere else or to be recycled.

What's more, light systems have other positive impacts on the timeline and cost involved with any project – reducing the amount of civil works required onsite for foundations, reducing the load bearing engineering requirements in building because the total building weight has been reduced, and enabling assembly using fewer skilled laborers. As more people understand the benefits and speed with which you can construct, I believe that it is a trend that will accelerate.

Finally, we need to consider waste. Construction waste has always been one of the biggest contributors to waste worldwide (an estimated 1.3 billion tons each year), and one report estimates that this is likely to nearly double to 2.2 billion tons by 2025 – that's a lot of landfill, and an enormous cost (and margin loss) to the industry. Our industry needs to embrace design-led construction if we want to combat this issue.

A design-led process enables you to plan every aspect of a project in advance and combined with accurate automated manufacturing keeps waste to a minimum. Our goal is always to have virtually no waste –everything built using the FRAMECAD system is designed and manufactured in such a way that minimizes production waste and no cutting or punching is needed once the materials come off the machine.

What role do modular systems have to play in construction moving forward?

Modular systems are going to play a huge part in construction moving forward – whether that's in the form of framing, roof trusses, or floor joists, or in complete volumetric construction (such as a bathroom module, tiny house, or even full apartment modules). We're going to see a shift towards modular construction as the default method especially in built-up urban areas where there simply isn't space to stage materials and assemble onsite. What's more, some cities are capping the transport and storage of materials onsite.

People are looking for a more controlled construction environment which allows them to use less labor and build faster. If you're building offsite, you're not subject to varying weather conditions (many of which are extreme). Building in a factory or other environmentally controlled space removes so many of the restrictions that slow down construction, such as lack of space, bad weather, or other tradespeople in the way. It's like a race car – why would you build a race car on the side of the track right before you go racing when you could build it in a controlled space fit for purpose?

Then there's the financial aspect. If you build modules in a factory environment with automated technology and machinery that allows you to reduce waste and produce at a faster rate, you will reduce costs. However, there are a few things that we need to be aware of when it comes to modular construction. Firstly, if you're exploring modular systems, then go with a method which accommodates any architectural design. Building in a modular manner shouldn't restrict what you're able to do – it should enable you to do even more. Modular construction should arrive millimeter perfect. If a module arrives with service holes in the right place, connections in the right place, and load transfers between modules correctly engineered, it will be simple to connect and faster to finish onsite.

We often have people describe the FRAMECAD system to us as an adult erect-a-set (or a Meccano set if you're in parts of the world influenced by the UK). Just like the sets we played with as children, everything is designed and manufactured in such a way that each piece is designed to fit together with the next piece – it all just pops into place perfectly and you can bolt it together. I'd love to see more widespread acceptance of modular building and the automated systems that better enable those modules, but I recognize that moving away from a business model you're already making money from is scary. There's always a risk in changing your business model, but we're seeing that the gain you get from making that change is typically always greater than the risk. When people come to that realization, they never look back.



Construction steel news headlines

construction market and regulations

Canadian Prime Minister Justin Trudeau has announced that US\$11.8 billion is to be invested in Canada's public infrastructure over the next eight years, in order to "rebuild a more sustainable and resilient economy". The investment will increase the country's use of cleaner electric power, zero-emission vehicles and related infrastructure, in order to reduce pollution and help fight climate change. It includes the provision of a dedicated planning fund to speed up major projects and support the expansion of the country's urban transport systems. [Link](#)

New York City Mayor Bill de Blasio announced that the city is restarting US\$17 billion of capital construction projects as part of its pandemic recovery effort. 1,700 construction projects will be given the green light by the end of March. [Link](#)

Toyota Motor Corporation has marked the start of construction works on its futuristic Woven City project with a ground-breaking ceremony, just one year after the project was first announced. Designed as a prototype for a fully connected environment, the experimental city is being built next to Toyota's Higashi-Fuji production site at the foot of Mount Fuji in Japan. Woven City will become a working community that will "bring new technology to life in a real-world environment across a wide range of areas", including automated driving, personal mobility, robotics and artificial intelligence. [Link](#)

Hong Kong, the world's capital

of tall buildings, is turning up the dial on high-rise sustainable design, as the city aims for net-zero emissions by 2050. Currently the city's 42,000 buildings, of which more than 1,500 are skyscrapers exceeding 100m in height – consume up to 90% of the city's electricity and contribute to 60% of the city's greenhouse gas emissions. [Link](#)

US construction industry takes first step toward comprehensive US BIM standard. National Institute of Building Sciences has already developed a national standard through a volunteer effort, but it has not evolved yet into a comprehensive standard like the one used in the UK. The new goal through a National BIM Program, according to NIBS, is "a solution at a national scale to enable digital process standards that will streamline business, accelerate the effectiveness of the supply chain, provide predictable processes, improve project outcomes, drive efficiency and foster innovation." [Link](#)

South Africa saw a 12.7% increase in civil tenders awarded in 2020 compared with 2019; however, there is a severe shortage in skills at municipalities and State-owned entities to implement infrastructure projects. The country is also seeing a "significant boom" in do-it-yourself and home improvement projects. [Link](#)

construction materials

Indian Ministry of Road Transport and Highways has issued orders that all types of steel will be allowed for the construction of highways in the country due to rising steel prices. [Link](#)

Starbucks recently built a drive-thru location in Canada using an energy-efficient modular system with near-zero construction waste. Designed, manufactured and constructed by Vancouver-based Nexii Building Solutions, the store was assembled and built in six days. Nexii recently released plans for its first U.S. production facility – the plant will be able to produce more than 8 million square feet of building panels a year for projects in Northeast U.S. markets. [Link](#)

The Associated General Contractors of America (AGC) has written an open letter to US president Joe Biden warning of the effects of recent increases in materials prices. According to the AGC, the cost of materials such as lumber and steel have reached "record-setting levels", partly as a result of tariff levels. The price for non-residential materials and services increased 2.5% between December and January, and 10.7% since April last year. [Link](#)

China plans to kick off trading in its first national emissions-trading scheme (ETS) by the end of June. The national ETS centre will be located in Shanghai while the registration system will be in Wuhan, Hubei province. China already operates emissions-trading programmes on a pilot basis in seven cities and provinces. These programmes typically cover eight emissions-intensive industrial sectors — power plants, cement and construction materials, steel, petrochemical, chemical, non-ferrous metal, paper and aviation. [Link](#)

An innovative Scottish company

has launched a unique rapid-building technology which offers an efficient solution for temporary and permanent structures. QuickBlock invented and makes a flat-packed, 100% recycled plastic, lightweight, modular building system. The blocks are easy to stack with no need for additional or specialist materials, tools or skills. [Link](#)

In what it's claiming is the world's first 3D-printed building facade using a process called cellular fabrication, a Tennessee credit union has unveiled its newest branch, complete with an undulating, multi-panel exterior that was "hung" on the building's underlying structure. 3D-printed building specialist Branch Technology claims the system is a unique printing method that allows material to solidify in open space, creating a matrix of polymer in virtually any shape. [Link](#)

construction sector players

US-based Tutor Perini reported that its fourth-quarter and year-end 2020 revenue was up 15% and 20%, respectively, from the same periods in 2019. The company realized double-digit, year-over-year income growth across all three of its segments — civil, building and specialty construction. [Link](#)

Tech giant Oracle has launched a range of solutions for the construction industry, using artificial intelligence to analyse project data. The suite of solutions is designed to help users detect risks and make more informed project decisions and the first application within the range, Oracle Construction Intelligence Cloud Service, is now generally available. [Link](#)

French construction and concessions group Vinci has released its annual financial results for 2020, describing a 'significant fall in earnings'

due to the damaging effects of the coronavirus pandemic. The company announced that its consolidated net income was down 62% compared to the previous year, while its consolidated revenue was down 10%. [Link](#)

Global construction materials company LafargeHolcim and energy technology firm Schlumberger New Energy are to collaborate on large-scale carbon capture and storage products. The technology-driven partnership will see the companies experiment with using Schlumberger's technologies to capture carbon at LafargeHolcim's cement plants. A feasibility study based on one of LafargeHolcim's European plants and at a second North American site will be conducted using Schlumberger's carbon sequestration technology. [Link](#)

Belgium-based Etex announces it has acquired a majority stake in leading French offsite construction company e-Loft. The company becomes part of Etex's New Ways division, which develops sustainable, industrialised and modular construction solutions. As such, the acquisition is a key milestone on Etex's strategic roadmap and an enabler of our ambition to shape the future of construction by "inspiring ways of living". [Link](#)

Swedish Skanska had a good 2020 despite the pandemic thanks to bumper windfalls in commercial real estate sales and the sale of its stake in a US toll road PPP scheme. Despite a 10% fall in operating revenue, the builder and property developer ended the year just over US\$1 billion in profit, 46% higher than 2019, beating the financial targets it had set for itself. [Link](#)

Modular prefabrication company and timber innovators Katerra has reportedly been saved from

bankruptcy by a \$200 million cash infusion from Japanese investment giant Softbank. In addition, Softbank is taking another 5 percent stake in the company, making it Katerra's majority shareholder. Katerra has struggled with delays, cost overruns and layoffs. Its co-founder, Michael Marks, stepped down as chief executive in May 2020, a month before 400 staff were laid off, about 7% of its total payroll. [Link](#)



World Steel Association

Avenue de Tervueren 270
1150 Brussels
Belgium

T: +32 (0) 2 702 89 00
F: +32 (0) 2 702 88 99
E: steel@worldsteel.org

C413 Office Building
Beijing Lufthansa Center
50 Liangmaqiao Road
Chaoyang District
Beijing 100125
China

T: +86 10 6464 6733
F: +86 10 6468 0728
E: china@worldsteel.org

constructsteel.org
worldsteel.org



constructsteel

worldsteel
ASSOCIATION