

constructsteel

Monthly update for the construction industry

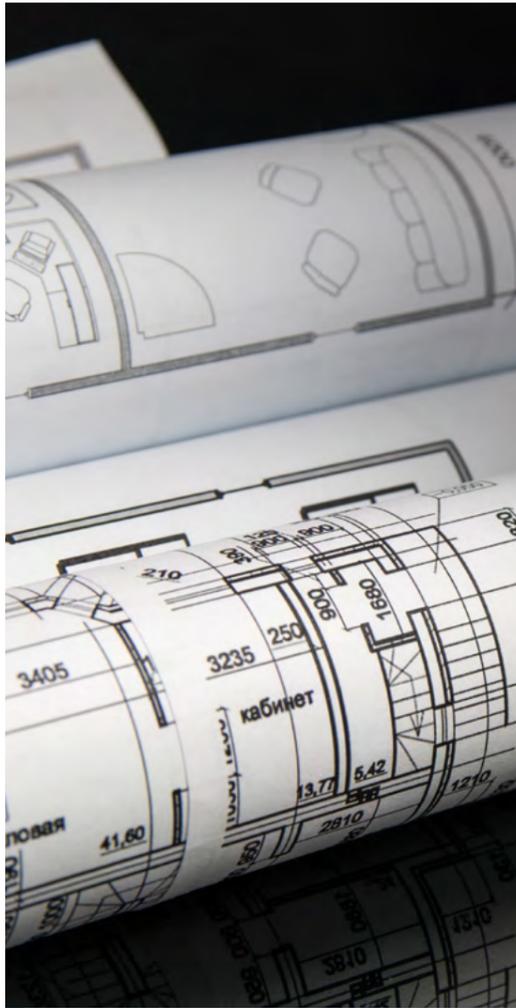
August 2020



constructsteel

McKinsey
& Company

Introduction



One of the most versatile and sustainable materials on the planet, steel sits at the core of the construction industry with good reason.



Terrence Busuttill
Head, constructsteel

Dear partners,

constructsteel welcomes you to the first edition of our monthly newsletter. The goal of the newsletter is twofold: to provide up-to-date information on the global construction industry. Secondly, to increase traffic towards constructsteel.org and interest in our steel construction promotion programmes. The newsletter touches on the following construction and steel construction related themes:

- **constructsteel activities**
- **Construction market trends**
- **News headlines**
- **Sector innovations**

To contribute in delivering a subset of the above, constructsteel is working with our knowledge partner, McKinsey & Company. Concerning sector innovations, interviews will be set up on a bi-monthly basis and will address topics relevant to the steel and construction industry.

What is constructsteel?

constructsteel is the steel construction market development programme of worldsteel. It is a platform which leverages the individual steel construction promotion efforts of members and non-members of worldsteel.

Why do we need constructsteel?

The positive global outlook for population and urbanisation means that the building and infrastructure industries are set to become a relatively more important customer of the steel industry. At the same time, the global market share of steel in buildings and infrastructure is generally low and presenting a huge opportunity for the steel industry. However, the steel industry is conscious that it cannot continue building as in the past. The current sustainability and circular economy debate means that we must rethink and reinvent the use of steel in construction and steel is central to this debate:

- Dry construction methods mean less water, aggregate and water are needed

- Offsite prefabrication and modular construction mean that the process is controlled, leading to faster construction and less labour on site
- Steel is a permanent material that can be infinitely recycled and is 100% recyclable without loss of quality
- Design for reuse means that a project built for today's needs could be reused in 30 years hence for completely different needs and thus making potentially less claims on virgin steel

How does constructsteel operate?

constructsteel project planning is structured along three dimensions:

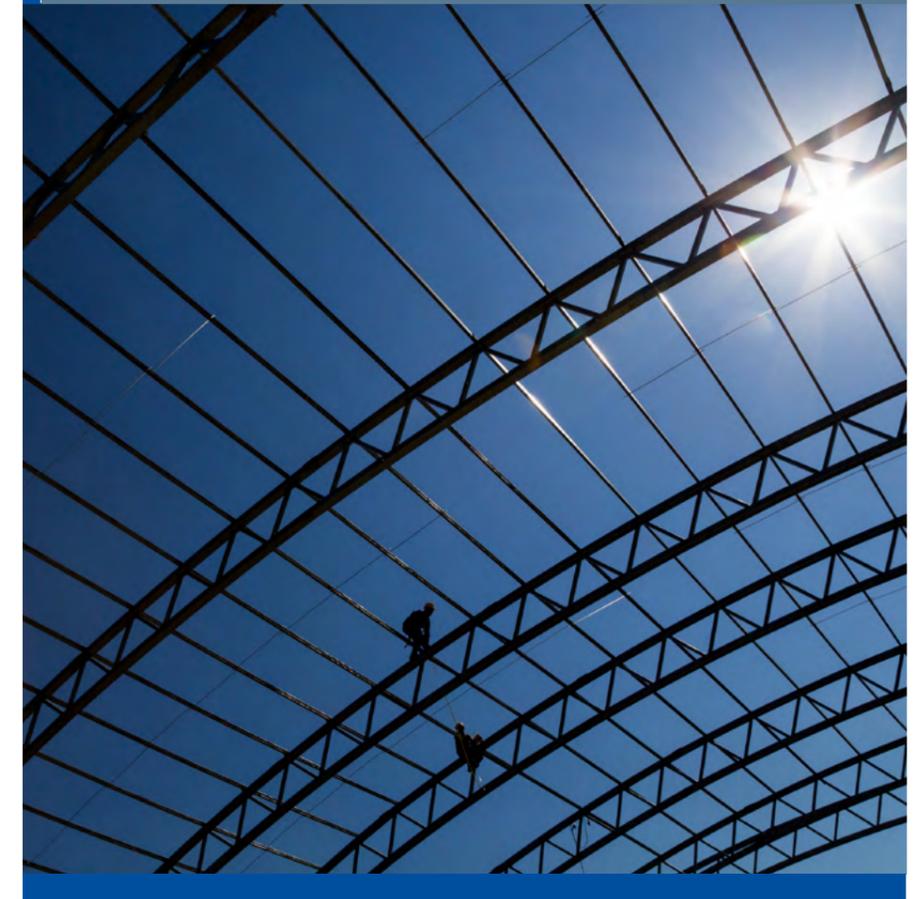
- Survey to identify topics and subjects that qualify for constructsteel programmes
- Technical work to address selected subjects
- Communication on results of technical studies and on key messages

Each year there should be a sufficient balance between all three dimensions leading to a yearly programme with budgets allocated respectively for the scope of work in the Annual Plan.

Recent appointments

The beginning of May 2020 saw the structure of constructsteel strengthened with the appointment of two senior steel construction experts from within the worldsteel membership. The Chairman and Vice Chairman have both been appointed for a period of two years and are tasked with guiding the business plan of constructsteel.

Steel is able to be deployed quickly, efficiently, cost-effectively and sustainably. It is accessible, adaptable and has a high strength-to-weight ratio that offers unparalleled flexibility of design.



Dr Joseph Seungmin La
Chairman, constructsteel
(General Manager, POSCO)



Jonathan Clemens
Vice Chairman, constructsteel
(Managing Director Catnic, Tata Steel Europe)

constructsteel activities

The activities of constructsteel are grouped into three broad areas:

1. Communications - constructsteel.org is the go-to place for information and stories on the use of steel in construction. All technical work undertaken by constructsteel is uploaded and promoted via the website and social media.

a. Expert Q&A articles – The first [interview](#) took place with Jyrki Kesti, Technology Director, Ruukki construction. In our first expert Q&A, Jyrki explains steel's contribution to sustainable buildings.

b. Infographics/report articles – May 2020 saw the publication of the [Best Practice Guide \(BPG\)](#) of best steel applications in Zero Energy Buildings. A communications campaign is being prepared to kick off in H2 2020.

c. Project case studies – Inspiring stories showcasing the architectural possibilities and sustainability characteristics of steel in various segments are regularly [posted](#).

2. Finding solutions to common interests – Survey to identify topics and subjects that qualify for constructsteel programmes.

a. Zero Energy Buildings (ZEBs) – The working group dedicated to the promotion of ZEBs was formed in February 2019 and its first deliverable being the Best Practice Guide (BPG), a document illustrating the use of steel in ZEBs targeted at the general public. Next steps:

i. Communications – as explained in 1b.

ii. Advocacy - A letter explaining the BPG and its contribution towards energy efficient buildings was sent to the CEO of the World Green Building Council in July. A request for collaboration was also made.

iii. Design & promotion of a two storey affordable house – constructsteel is working with members and non-members of worldsteel in the design, prototype development and marketing/promotion of a two storey house. The goal of the project is two fold: firstly, to show that steel solutions are key to reducing operational energy use and emissions. Secondly, to show that the prototype house is sustainable through design encompassing modular & prefabrication methods and reuse.

b. Life Cycle Assessment (LCA) - LCA studies are undertaken to position steel vs other materials.

i. Cold formed sections – [a technical study](#) measured the performance of a low-rise residential building in steel vs other materials. In addition, [an LCA](#) showed steel's competitiveness vis-à-vis the reinforced concrete building.

ii. Roofing – an LCA of the roofing system of a typical single storey Scandinavian house was recently undertaken. The results suggest there is a strong case for steel.

3. Sharing best practices – focuses on the ability of constructsteel to bring various construction players together for the purposes of networking.

a. constructsteel annual conference 2020. The yearly event which has been running since 2017 was scheduled to take place in Delhi, India during the month of May 2020. However, due to COVID-19 the event has been moved to May 2021.

Construction market trends

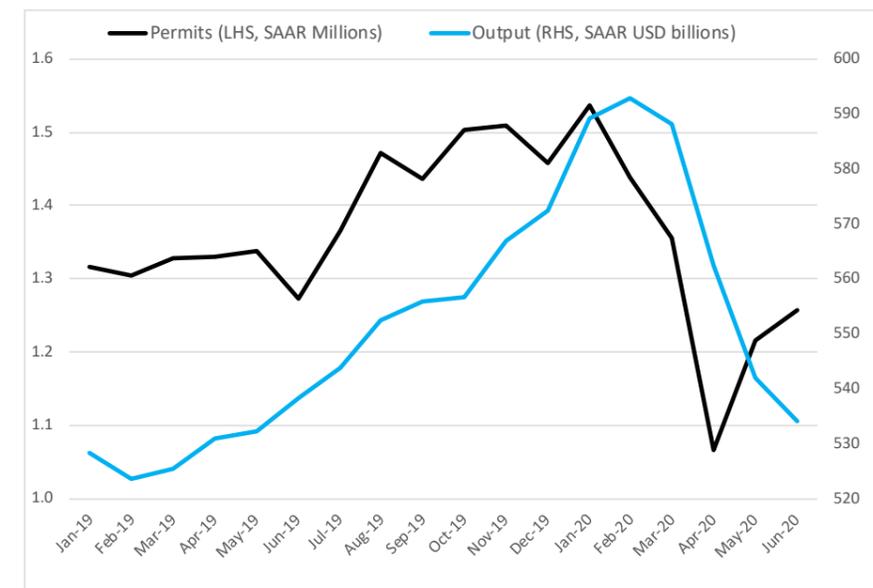
United States Leading indicators point to improving sentiment from the lows seen in April 2020. Output expected to improve in the second half of 2020.

Residential construction put in place fell for the fourth month in June and by -0.8% and showed similar declines on a y-o-y basis. Building permits continued to increase in June and by the second straight month but are still down -1% y-o-y.

The Architectural Billings Index (ABI) bottomed in April 2020 at 29.5 and reached the level of 40 in June. Private non-residential construction increased for the first time in four months in June but output is still down over -3% y-o-y.

Building permits vs residential construction put in place

Source: US Census, McKinsey & Company

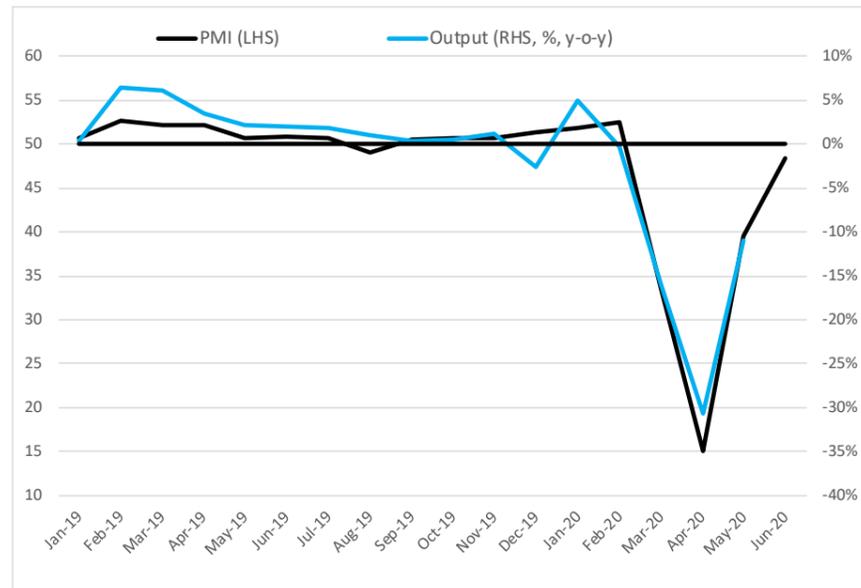


Europe Indicators show activity improving from the lows seen in April 2020.

Eurozone construction sector output jumped 28% in May over April, but is still down -11% y-o-y. The IHS Markit Eurozone Construction PMI increased to 48.3 in June of 2020 from 39.5 in May meaning a narrowing in the contraction of activity is expected.

Construction sector production (seasonal and calendar adjusted vs PMI (eurozone))

Source: Eurostat, IHS Markit, McKinsey & Company

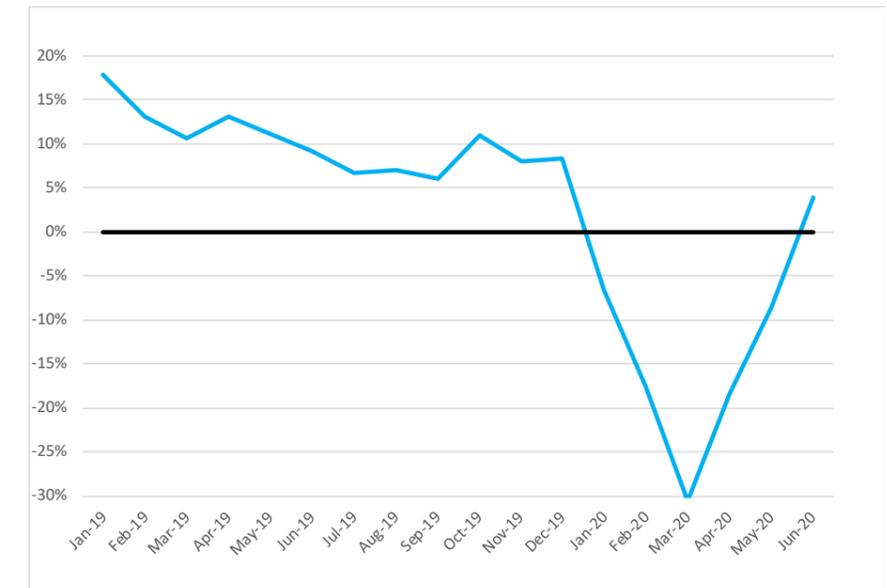


China Pickup in activity from the lows seen in early 2020 will continue in the coming months.

The positive trend in residential floor space started continued in June, with the 3 month moving average y-o-y growth up by 4%. At the same time, floor space sold increased by 3% during the same period.

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

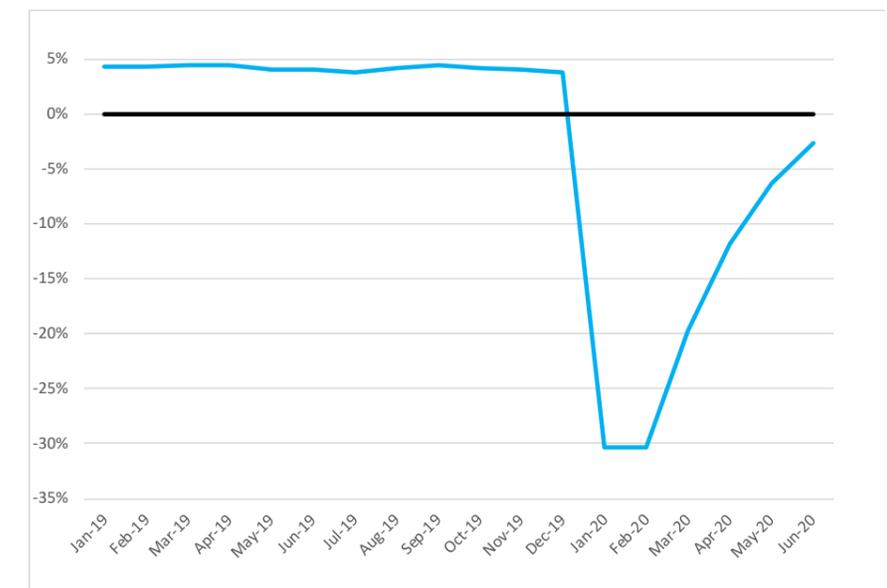
Source: National Bureau Statistics of China, McKinsey & Company



The decline in infrastructure investment activity continued to narrow in June, with year-to-date activity for the first half of the year falling -2.7%. However, railway and road transport were up 2.5% and 1% respectively while civil aviation was down -40% during the same period.

Infrastructure (YTD, % y-o-y)

Source: National Bureau Statistics of China, McKinsey & Company



The construction industry is the most important customer for the steel industry in terms of tonnage. Even split into longs, strip and reinforcing bar, this demonstrates that sub-segments of construction are larger than other sectors.

STEEL FACTS

The amount of steel used in the world reached 1,712 Mt in 2018. Steel markets are distributed as follows:

- Buildings and infrastructure **51%**
- Automotive **12%**
- Metal products **11%**
- Mechanical equipment **15%**
- Other transport **5%**
- Domestic appliances **3%**
- Electrical equipment **3%**

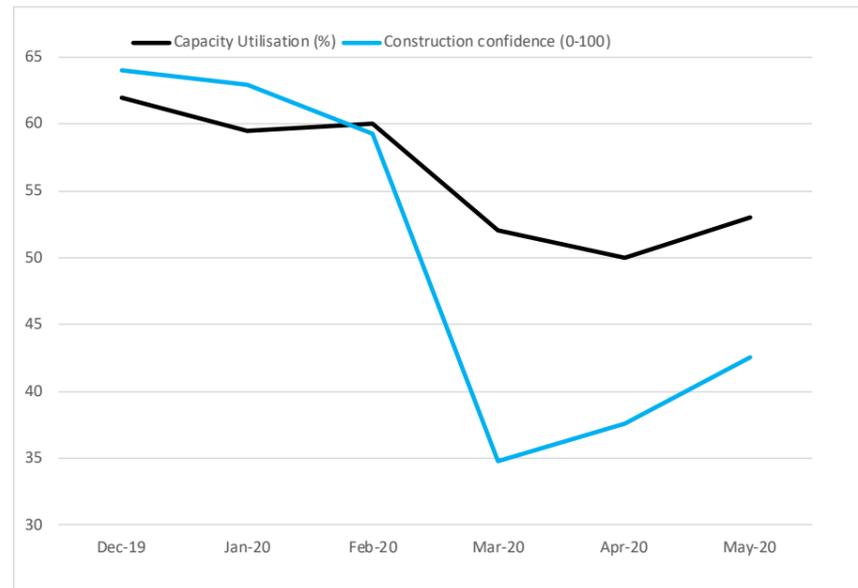
worldsteel.org

Other regions

Operating capacity utilisation of Brazilian construction companies increased slightly in May to the level of 53% - this is still lower than the 55-60% average seen over the past years. Construction confidence index has been improving since March, still being lower than 50, indicating lack of confidence in the sector. Last time the indicator dropped to such a level was in the summer of 2016.

Brazil construction sector capacity utilisation and confidence

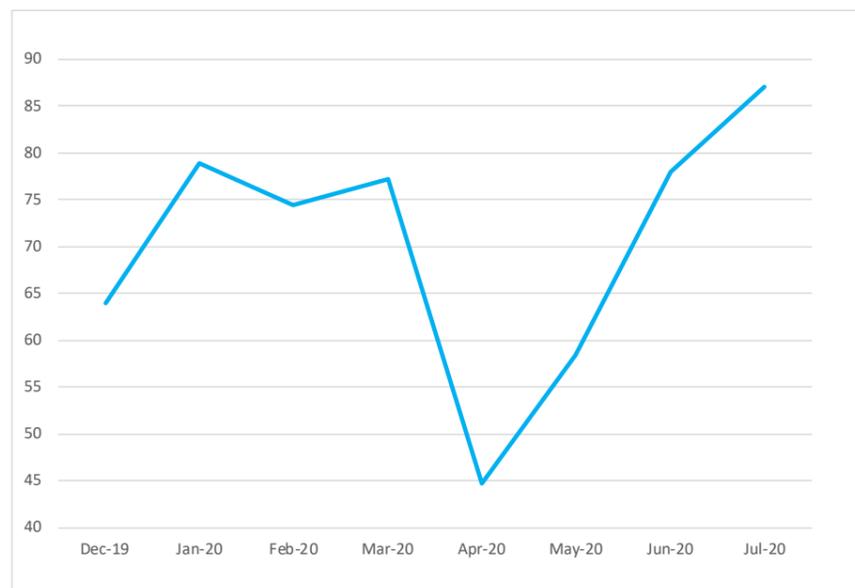
Source: CBIC-CNI Construction Industry Survey, McKinsey & Company



Turkish construction sector confidence index recovered in July for the third month in a row, currently exceeding pre-pandemic levels - index went up 11.6% from last month, mainly driven by increase in current overall order books sub-index.

Construction sector confidence index score

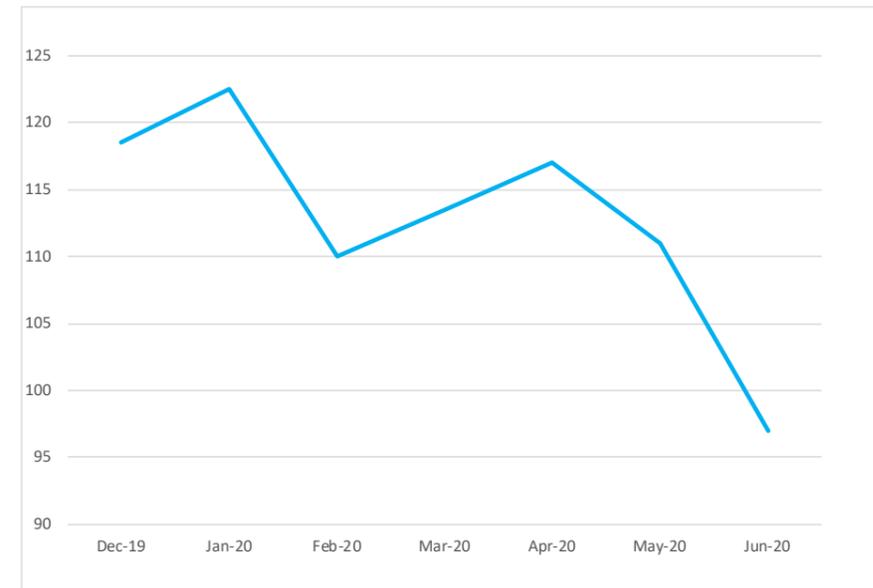
Source: Turkey Statistics Office, McKinsey & Company



South Africa's Afrimat Construction Index dropped to 97 for the first time since compilation of the index began; hope for recovery for the construction sector lies in Government's infrastructure-led economic growth recovery plan post COVID-19.

South Africa's Afrimat construction index

Source: Afrimat, McKinsey & Company



News headlines

construction market and regulations

White House loosens environmental law to speed up infrastructure projects in the US – the effective date is Sept 14th; however, it is subject to congressional review, which could delay or even prevent its implementation. [Link](#). Also, US House Democrats have unveiled a \$1.5 trillion infrastructure bill that includes almost \$500 billion of green measures proposed as part of the Investing in a New Vision for the Environment and Surface Transportation in America (INVEST in America) Act. [Link](#).

China has pledged fresh efforts in advancing the construction of new infrastructure projects – the country plans to issue 3.75 trillion yuan (about \$529 billion dollars) of special local government bonds this year, up 1.6 trillion yuan from the previous year, with priority given to new infrastructure, new urbanisation initiatives and major projects. [Link](#).

A surge in condominium sales helped China's economy grow at a better-than-expected rate in the April-June quarter. In central Beijing, 400 luxury condos sell out in a day. [Link](#).

The construction sector in Russia is expected to face around 10% of financial losses due to the COVID pandemic – the situation varies across regions with Moscow and Moscow region affected substantially as housing construction has been halted. [Link](#).

According to the survey conducted by the Saudi Contractors Authority, the kingdom expects

to see 20% decrease in awarded projects this year. [Link](#). The country's cement sector however, has witnessed an 11% increase in material demand for the first five months of 2020 compared to the same period last year, despite the lockdown period. [Link](#).

The European Innovation Council has awarded over €307 million to 64 game-changing 'green deal' start-ups and SMEs contributing to the objectives of the European Green Deal Strategy and the Recovery Plan for Europe. Among beneficiaries are several construction materials and E&C companies. Overall, the European Green Deal provides a roadmap with actions to boost the efficient use of resources by moving to a clean, circular economy. [Link](#).

Euroconstruct, one of the leading European organisations covering the construction sector, expects an 11.5% drop in total construction output in Europe. Among the "big five" countries, it is only Germany that will see a small decrease of -2.5% in total construction this year, while the rest (France, Italy, Spain and the UK) are expecting to see declines of between 12-33%. [Link](#).

According to real estate developers, property sales in India are likely to remain muted in the coming months. The real estate sector has been facing headwinds for the past three-four years as well as delays in approvals, and the COVID-19 crisis has further impacted market sentiment and sales. [Link](#).

A new \$1.36 billion fund has been set up to help construction companies in Singapore, among the hardest-hit by the COVID-19

pandemic, to safely restart work. [Link](#).

construction materials

China's demand for construction steel, including rebar, is expected to improve further in the second half of 2020, though the monthly demand for July-December is unlikely to match the peaks in March-May. [Link](#).

India's domestic demand for structural steel products accelerated in May-June as construction companies increasingly opted for customisable building material for high-rise structures, apartments and quarantine facilities in the face of labour shortages due to the lockdown. [Link](#).

The Turner Building Cost Index, which measures costs in the US non-residential building construction market, fell to a value of 1177 in the second quarter of 2020, a 1.01% quarterly reduction from the first quarter; this is the first time the index has reduced in value since 2010. [Link](#).

The European steel sector has been strongly affected by COVID-19, with strong hopes for public infrastructure construction projects to help the sector. [Link](#).

Oman's construction sector is to benefit from new steel capacity (360,000 tons of high-yield strength rebars) by Raysut Steel Industries. [Link](#).

LafargeHolcim introduced ECOPact, a range of green

concrete designed for high performance and sustainability, to the US, with plans to expand into the UK, Canada, Latin America and other markets worldwide in the coming months. ECOPact is sold at a range of low-carbon levels, from 30% to 100% less carbon emissions compared to standard (CEM I) concrete. [Link](#).

Turkey has imposed new additional customs duties of up to 20% on more than 400 products, including some steel products, like sections, non-alloy/stainless wire and pipe and tube fittings, in order to protect its domestic industry from import pressure. [Link](#).

construction sector players

The UK's largest building materials company Travis Perkins is to close around 165 of its locations and could reduce its workforce by 2,500 - 9% of the total - as a result of the Covid-19 pandemic. [Link](#).

UK-based Balfour Beatty reveals £4bn order-book boost – a £760m Hong Kong airport deal and £3bn worth of HS2 contracts boosted Balfour Beatty's order book by 20 percent in May. [Link](#).

Sweden-based general contractor Skanska reported a 2020 second quarter operating profit \$95.4 million, down 69% from a year earlier. The firm said it had a strong first quarter, but that the second quarter was "disrupted" by the pandemic, and that its construction projects in Europe and U.S. were impacted. [Link](#).

85 percent of infrastructure companies in India expect a substantial hit to revenues of about 55-65 percent in the April-June quarter. [Link](#).

Hitachi Construction Machinery Europe NV plans to stop production and assembly of machines and to return to relying on imported finished machines. Netherlands-based operations will be repurposed for customising machines to meet specific customer requests, while production and assembly of standard machines will be left mainly to the factories in Japan. [Link](#).

Bouygues Construction and software developer Dassault Systèmes have announced a long-term partnership, with the intention of broadening and accelerating the digitalisation of the construction process. Dassault also plans to introduce the use of virtual twins more generally into construction, while Bouygues aims to make greater use of modular assembly components – particularly in the construction of retirement homes and student residences – in an effort to reduce waste and improve productivity. [Link](#).

Steel is a permanent material that can be infinitely recycled and is 100% recyclable without loss of quality

Sector innovations - Modular construction

Modular construction involves producing standardised components of a structure in an off-site factory, then assembling them on-site. Terms such as “off-site construction,” “prefabrication,” and “modular construction” are used interchangeably. These terms cover a range of different approaches and systems, from single elements that are clipped together using standard connections and interfaces to 3D volumetric units with full fixtures (Exhibit 1).

Exhibit 1

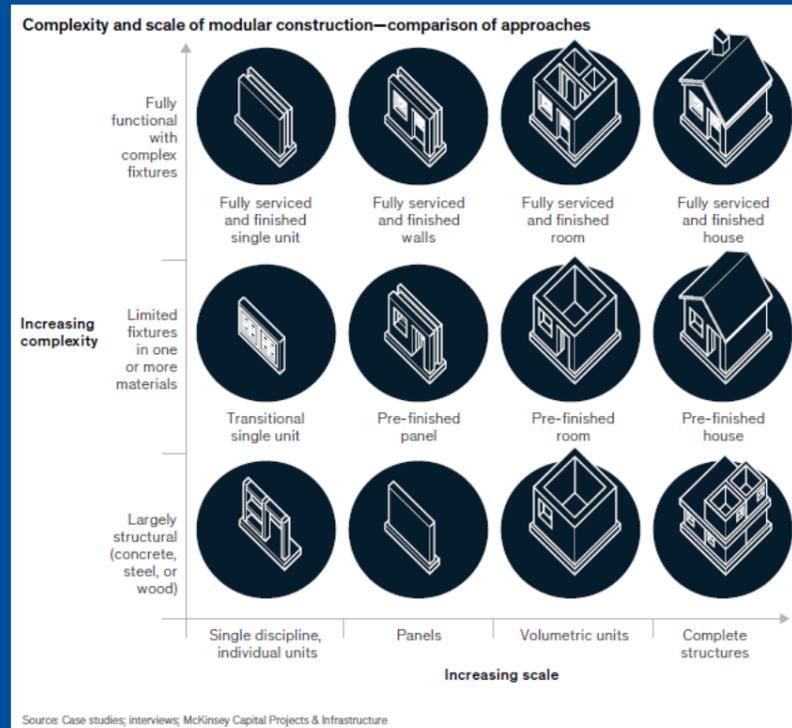
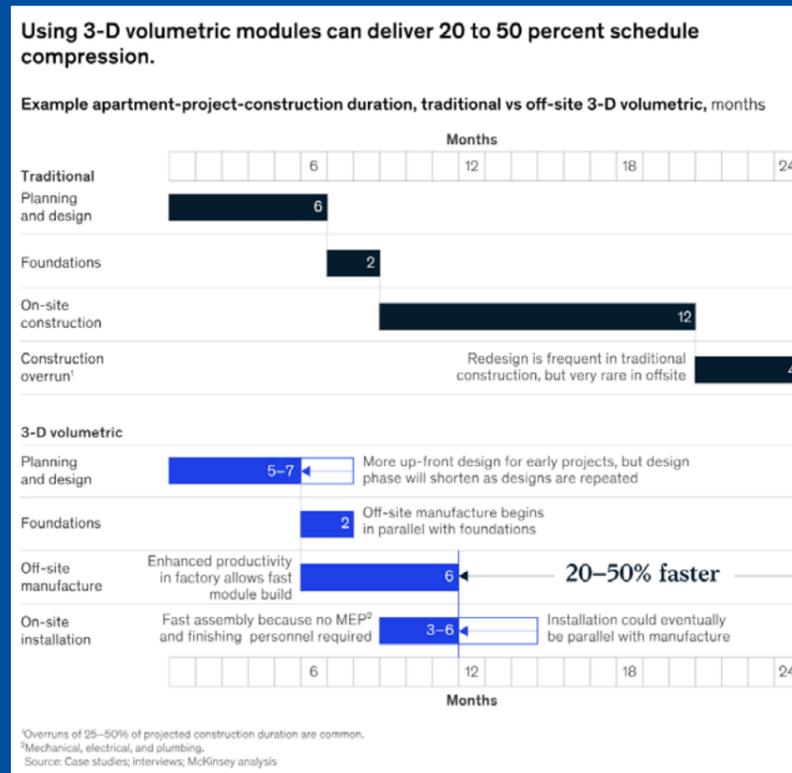


Exhibit 2



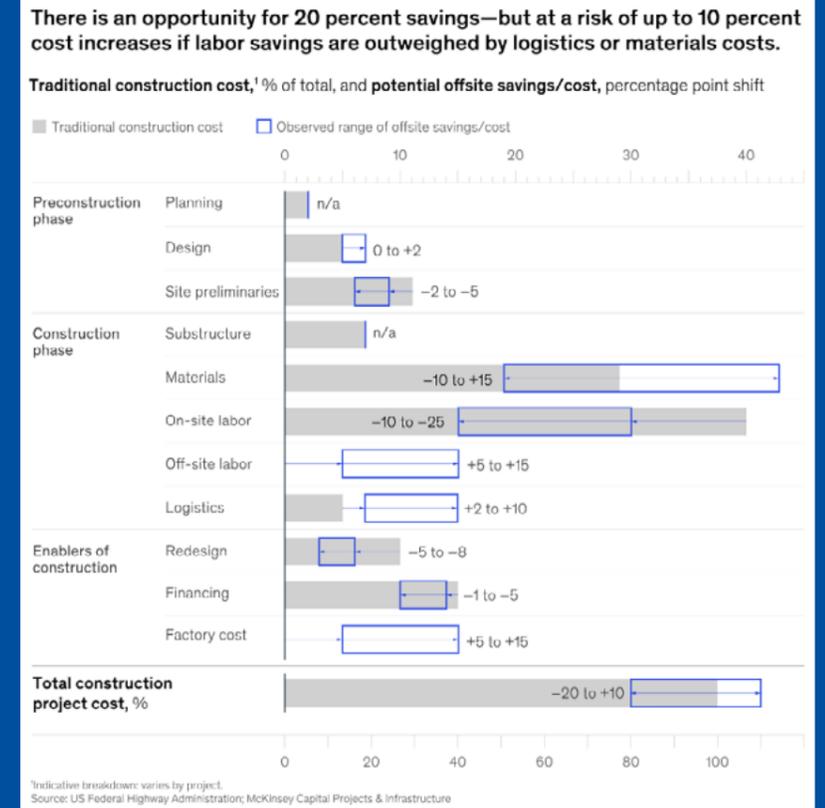
According to the McKinsey “Modular construction: From projects to products” report, modular construction has significant potential to increase construction sector productivity – recent modular projects have already established a solid track record of accelerating project timelines by 20-50% (Exhibit 2). Additional savings potential is feasible in gains in full-life costs (for instance, through reducing running costs via energy and maintenance savings) (Exhibit 3).

The COVID pandemic is likely to accelerate the use of modular construction technologies. For instance, large construction firms in India have turned to the use of prefabricated structures as a stringent lockdown slowed the movement of men and material to work sites.

Tata Projects is building a 400-bed medical facility at Kerala’s Kasargod – Tata Steel will supply a range of modular pre-fabricated Completely Built Units to be used primarily as quarantine and isolation cabins, rest rooms, canteens and other service units within the hospital on a 5-acre plot. The pre-fabricated units are being produced by Tata Steel’s brand Nest-In by the Tubes Division and New Materials Business, in collaboration with eight manufacturing partners across the country. Besides steel, Tata Steel is using Fibre Reinforced Polymer to manufacture quarantine units for the first time in India¹. Tata BlueScope Steel is also ramping up health infrastructure to combat the coronavirus pandemic with Smart Steel Structures that are easy to install, modular life-care structures. Supplied under EZYBUILD(R) smart steel solutions, these hygienic Isolation Units and contactless Testing & Sample collection kiosks are designed as per medical guidelines on social distancing².

Also in India, realty developer Omaxe is partnering with Jindal Steel and Power for a commercial project development – the building is designed using high-grade steel structure with fabricated beam column as compared to the conventional construction methodology. Additionally, Omaxe is also deploying other time-saving measures to make up for the lost time in construction

Exhibit 3



by adopting Diaphragm wall (D-wall) construction modules and HDPE membranes for foundation waterproofing to name a few. Overall, the technology is expected save 40% of the construction time³.

Brazilian steel firm Gerdau has recently implemented modular metal construction into its growth strategy and new business development strategy. Preference for modular has been particularly apparent during the coronavirus pandemic, with the need to be able to rapidly construct field hospitals at much faster rates than normal hospital units. Gerdau intends for its new business division to account for 20% of revenue within ten years through the development of new systems, technology and methods, and the company is also working with partners and startups in the civil construction sector to develop these⁴.

Interesting moves are happening also in construction technology space. Bouygues Construction and software developer Dassault Systèmes have just announced a long-term partnership where Bouygues aims to make greater use of modular assembly components – particular in the construction of retirement homes and student residences⁵. Google has recently deployed the first \$115 million of the \$1 billion commitment it made last year to affordable housing – its investments so far have included \$100 million in low-cost funding for housing developers and an investment in a modular-housing company, Factory_OS⁶.

¹Construction firms rely on prefab tech to bypass covid hurdles, Mint, Jul 21 2020
² Insights: Building with Smart Steel Structures, MGS Architecture, June 30 2020
³ Omaxe to utilise advanced steel structure technology for commercial project, Projects Today, Jul 22 2020
⁴ Brazil: Gerdau advances with modular meta construction strategy, Esmerk Latin America News, May 20 2020
⁵ Bouygues and Dassault in tech partnership, KHL, 23 Jul 2020
⁶ Tech Giants Aim to Solve West Coast Housing Shortage, WSJ, 23 Jul 2020

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