

CONSTRUCTION europe

THE MAGAZINE FOR EUROPE'S CONSTRUCTION INDUSTRY

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WOMEN IN CONSTRUCTION

An industry acknowledging
the benefits of diversity

p34





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WE CAN ALL LEARN NEW TRICKS

Things are changing in the construction industry, and not just in response to the pandemic.

Within the next decade, a significant percentage of the construction workforce in Europe will reach retirement age.

This presents a number of problems, including not only skills lost to construction projects, but also lost opportunities for those skills to be passed on to younger, less experienced workers.

Add to that the potential economic impact of projects taking longer to complete and increased rework when tasks are not completed to requisite standards, and we have a real problem.

A more optimistic view is that younger workers entering the industry will lead to new and innovative ideas, possibly taking construction to new levels of efficiency and productivity.

The problem with that notion is that there just aren't the numbers coming into construction, to match those heading for retirement.

In answer to this situation, many contractors are asking older workers to stay on past retirement age. While they're often happy to do this, it doesn't look like a long-term solution to a fast-growing issue.

It is, of course, hoped that the increasing use of construction technology will attract a new demographic to the industry – and not just to the planning and design stage of projects, but to the construction site too, where innovations such as virtual and augmented reality, wearable tech, drones and other next generation surveying equipment are now being more widely used.

This being the case – and as we aim to inject new life into construction projects with new technologies – it's worth noting that older members of the workforce might also be keen to develop new skills. In fact, they could be key to showing the way to most effectively combining traditional techniques and new technology that could boost efficiency and productivity.

Mike Hayes,

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Form it. Stack it. Change it. Move it.

IT TOOK ABOUT TWENTY YEARS TO BUILD THE GREAT WALL,
WITH BETONBLOCK WE COULD HAVE DONE IT IN TWENTY DAYS





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ON THE COVER
CE reviews whether the pandemic represents a real opportunity to 're-balance' the construction industry, to include greater representation of women and minority groups
PHOTO: ADOBE

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EVENTS DIARY

2022**UK Construction Week**

May 3-5, 2022

London

UK

ukconstructionweek.com

GIC-Concrete Days

April 28-30, 2022

Piacenza

Italy

www.gic-expo.it

Hillhead

June 21-23, 2022

Buxton

UK

www.hillhead.com

Bauma

October 24-30, 2022

Munich, Germany

www.bauma.de

GERMANY

97% of space booked for Bauma

World's largest construction trade fair confirms high level of participation

Messe München says 97% of the available space has now been booked for its Bauma construction trade fair, set to take place in Munich between 24 and 30 October this year.

The exhibition was originally planned for April, but a year ago the organiser acknowledged there was "a growing recognition that the April date involved too many uncertainties in view of the global pandemic" and pushed the event back.

Klauss Dittrich, Messe München's chairman and CEO, said, "In the personal conversations we have with exhibitors and visitors, we hear one thing over and over again: They are really looking forward to having face-to-face discussions and, of course, to experiencing the special atmosphere that only bauma can create."

The event will include an Innovation Hub, including a zone dedicated to the deeper understanding of how technology can connect machines and how



Bauma Munich, the world's largest construction trade fair

construction businesses can make best use of data.

Ahead of the fair itself, Bauma is launching a new webinar series, to start in March, which will look at a number of hot topics for the construction industry, including zero emissions, the digital construction site and the path to autonomous machines.

ce

EUROPE

Reports of tightening transport regs in Europe

Tightening of regulations for abnormal transport loads have been reported in Germany, France and Belgium, the European association for abnormal road transport and mobile cranes ESTA says.

"These are all worrying developments which give the impression some authorities have started a campaign to harass abnormal transports," the

association said.

In Germany deviations from permitted dimensions, overall weight and axle load are still restricted in that only limited variation from those mentioned in the abnormal transport permit is allowed. This provision was originally to apply from 1 January 2021 but was postponed.



ESTA said it has received reports that France, since 1 January, has also been imposing stricter requirements on drivers of exceptional transports. Drivers of category 1

transports or a co-driver present must now have a sufficient command of the French language. If not, an escort vehicle must be present during the transport.

'Worrying developments' in abnormal road transport
PHOTO: ADOBE IMAGES

ESTA has received reports Belgian police have been carrying out frequent checks for rear marker signs on commercial vehicles. The checks are happening even though these signs have not been compulsory for the registration of lorries and trailers in the European Union for years.

ce

FRANCE

Vinci confirms strong recovery in 2021 results

French construction and concessions giant Vinci has reported a sharp rise in revenues in its financial results for 2021.

The full-year figure for consolidated (group) revenue stands at €49.4 billion, up 14.3% on 2020 and up 3% on the pre-pandemic year of 2019.

Cash flow for the group stands at €5.3 billion, almost €1.1 billion ahead of the 2019 figure.

Commenting on the strong performance, Vinci CEO, Xavier Huillard, said the company's strategy had allowed it to benefit from a number of megatrends, including energy efficiency, increasing demand for electricity and the digital revolution.

The group's order book, valued at €44.5 billion, is 5% ahead of 2020's figure and an impressive 22% up on its total value in 2019.

Authorities in Rotterdam have agreed to dismantle part of the De Hef Bridge to allow a sailing yacht, built for Amazon boss Jeff Bezos, to pass through; a controversial decision since the council previously promised not to touch the national monument after its restoration in 2017.

Bezos commissioned a Dutch company to build the giant 127m-long three-masted yacht, which when completed will exceed the 40m bridge clearance. This led the company to ask the municipality to dismantle the central structure with the costs being borne by Bezos himself.

Ton Wesselink of the Rotterdam Historical Society said, "the risk of damage to the structure can be reduced...because the tasks will be done by professional people - the risk will always be there."

Rotterdam's De Hef bridge

PHOTO: ADOBE IMAGES





European Commission plans to include nuclear projects in 'green' finance taxonomy
PHOTO: ADOBE IMAGES

EUROPE

EU moves to name nuclear a 'green' energy source

Nuclear and gas energy projects could gain sustainable financing under proposal

The European Commission (EC) has released a draft document to European member states, outlining its plan to classify some nuclear energy projects within its Taxonomy for Sustainable Finance.

This means three types of nuclear construction activity could now receive so-called ESG (Environmental Social and Governance) financing, intended to aid projects that promote the reduction of carbon emissions throughout the bloc.

The three classified types are:

- demonstration units for advanced nuclear technologies;
- the construction of new nuclear power plants using best available technologies;
- electricity generation from existing nuclear installations

In the EC proposal, new nuclear projects seeking ESG financing must fulfil specific criteria, including taking measures to protect facilities against hazards including flooding and extreme weather, a threshold for lifecycle greenhouse gas emissions and plans for the disposal of high-level waste.

A full notification and reporting process to the Commission will also need to be in place. **ce**

UK

CEA: 48% rise in UK construction equipment sales 'very positive'

Retail sales of construction and earthmoving equipment maintained their strength in the final quarter of 2021, and showed an

increase of just under 18% compared with Q4 2020.

As a result, sales for the whole of 2021 finished the year at 48% above 2020 levels, reaching over 36,000 units for the equipment types covered in the construction equipment statistics exchange.

This means that sales last year exceeded the levels reached in 2018 and 2019, which were reported as being peak levels for the industry since before the "financial crash" in the decade before.

This is consistent with comments from many CEA members who have been saying that 2021

was a "record year" in recent times for product sales.

Suneeta Johal, Chief Executive at the CEA, said, "The latest statistics have revealed that sales maintained their strength in the closing months of the year and were 18% up in Q4 compared with the last quarter of 2020, which is very positive news for our sector. As a result, sales for the full year ended up at 48% above 2020 levels and exceeded 2018 and 2019 levels.

"The increase in demand for telehandlers and larger machines can be attributed to major infrastructure projects such as HS2." **ce**



NIBS



UK BRITISHVOLT FUNDING

The UK government has announced that it has put forward an offer in principle to Britishvolt (BV) for £1.7 billion (\$2.3 billion) in private funding. The funds will be supported by the Automotive Transformation Fund and delivered by the Advanced Propulsion Centre. The money will be used to support construction of BV's full-scale gigaplant factory which will manufacture electric vehicle battery cells.

EUROPE NEW CECE PRESIDENT

The Committee for European Construction Equipment (CECE) has announced Alexandre Marchetta, the CEO of Mecalac Group, as its new President. Marchetta, who took up the two-year position at the beginning of January, takes over the role from Niklas Nillroth, the Vice President and head of Sustainability & Public Affairs at Volvo Construction Equipment. Speaking of his new role, Marchetta said, "The beginning of my Presidency coincides with France taking over the rotating Presidency of the Council of the European Union."



SWEDEN SOLID RESULTS FOR SKANSKA

Skanska has reported a 7% drop in its yearly revenues for 2021, bringing in a total of SEK147.6 billion (€14.2 billion) for the year. While the revenue decrease, which when adjusted for currency effects amounts to a 4% decline, reflects the "lagging effects from the pandemic", Skanska said its "selective approach, strong commercial management and local expertise" had enabled it to successfully manage the challenges of the past year.

NETHERLANDS ROYAL BAM'S GALÈRE SALE COMPLETE

The Netherlands-based construction group Royal BAM has completed the sale of its operating company BAM Galère, to the Belgian construction firm Thomas & Piron Group. BAM Galère, based in Liège, undertakes infrastructure projects in the private and public sectors in Belgium, while its subsidiary BAM Lux – also part of the sale – operates in Luxembourg. Financial details of the sale are not being disclosed, but the annual revenues of BAM Galère are reported to be approximately €200 million. The company currently employs some 650 staff.

An impression of the proposed Tour Triangle

IMAGE: HERZOG & DE MEURON



FRANCE

Besix to build €670m Tour Triangle in Paris

High-profile skyscraper gets green light, 15 years after initial proposal

Belgian construction firm Besix has been awarded a €670 million contract to build a 180m-high triangular skyscraper in the heart of Paris.

The Triangle will be the third-tallest building in the French capital, when completed.

Some 15 years on from the initial proposal - and following numerous objections from critics - the developer, Unibail-Rodamco-Westfield (URW) was given the go-ahead to move to the construction phase of the project.

Designed by Swiss-based Herzog & de Meuron, the tower is intended to comply with BREEAM (Excellent) and HQE (Exceptional) green building standards.

The structure will include 1,000m² of photovoltaic panels, a bioclimatic façade and geothermal heating systems.

Triangle will incorporate low-carbon materials, with at least 50% of its concrete featuring CO₂ emissions. Recycled materials will also be used, particularly for the aluminium facades.

Set to include offices, a conference centre, shops, restaurants and a hotel, construction of the 42-storey Triangle is set to start before the end of the year, with completion expected in 2026.

ce

CIS MEMBERS

Kazakhstan plans first nuclear plant in 50 years

The government of Kazakhstan is currently in talks with Russia's nuclear energy company Rosatom, regarding the construction of a large-scale nuclear power plant.

The facility would be the first to be built in Kazakhstan for almost 50 years, and would also be the country's only operational nuclear plant, following the permanent closure of the reactor at Aktau in 1999.

Coal-fired power plants currently generate some 70% of Kazakhstan's power and the chairman

of Kazakhstan's agency for strategic planning and reforms, Kairat Kelimbetov, said it will be impossible for the country to meet its target of a 15% reduction in CO₂ emissions by 2030, without commissioning a large-capacity nuclear plant.

Russian news agency Sputnik recently reported that the Kazakhstan government is keen to build the plant in Ulken, a village originally founded to house workers for a power plant that was cancelled following the collapse

of the Soviet Union.

Almasadam Satkaliyev, chairman of Kazakhstan's sovereign wealth fund Samruk-Kazyna, said it was currently considering

proposals for reactor technologies from Chinese French and Russian companies.

Additionally, the government is said to be

exploring the feasibility of deploying a number of small modular reactors, to help the country's drive to carbon neutrality by 2060.

ce

EVENTS

First speaker announced for contech summit

IBM's head of BIM to discuss construction's continuing digital development

KHL has announced the first speaker for its Construction Technology Summit, a virtual event taking place at 4pm (Brussels time) on Thursday, April 21.



Paul Surin has 15 years' industry experience and is the global engineering, construction, operations and BIM segment lead with IBM.

As well as regularly speaking on the subject of the use (and misuse) of BIM, Surin has expertise in areas as diverse as artificial intelligence, renewable energy technologies, digital twins, data and analytics, standards and regulations.

He says, "I am passionate about innovating and transforming business models which have been challenged by new technologies, new competitors, and market shifts, delivering innovative and commercially favourable solutions to all technical, commercial and digital matters."

Surin has a Masters Degree in mechatronics, electronics and engineering and a post-graduate diploma in Sustainable Built Environment.

Further high-profile speakers will shortly be announced for the event, the second Construction Technology Summit, which is being organised as a collaboration between *Construction Europe* and *International Construction*.

As well as the latest thoughts on BIM, subjects to be covered at the summit include the use and security of data and the gains and potential challenges for contractors investing in digital technology.

For more information on the Construction Technology Summit 2022, and to register as a delegate, visit www.ct-summit.com

PHOTO: ADOBE IMAGES





Komatsu PC24MR-5

Your new 2.4 tonnes mini-excavator is designed for simple transportability and easy operation. Built around a low-emissions EU Stage V engine and just 1450 mm wide, it also features an extremely compact short-tail of and a large cab, for the highest levels of safety and operator comfort.



Construction 4.0 key to sustainability

A new study has concluded that widespread adoption of cutting-edge technology has the potential to significantly aid the construction industry's efforts to cut carbon emissions, as well as increasing productivity and reducing project costs.

Researchers from the UK's University of Exeter Business School created a Construction 4.0 framework to examine the potential impact on construction of technologies including the Internet of Things (IoT), blockchain, drones, AI and self-healing materials.

The study concluded that an increase of around 20%, across all categories, was likely in the next five years.

At the forefront of technologies for the industry, the study highlighted the Internet of Things, through its ability to track and monitor equipment and materials.

Robotic technology, drones and 3D printing were also expected to move into the construction mainstream, as well as collaboration technologies, such as BIM (building information modelling).

The research team concluded that the environmental benefits of using currently available technologies included savings in energy, water, materials and human resources, adding that they were capable of reducing the cost of projects and the operational cost of buildings.

The framework was tested through a real-world case study of the construction industry in the United Arab Emirates (UAE).

Drone technology to play a role in construction's future sustainability



PHOTO: ADOBE



PHOTO: ELONROAD WEBSITE

EVolutionRoad, an electric road pilot scheme, is currently running in Lund, Sweden

Site chosen for world's first permanent electric road

A 21km section of the E20 in Sweden will have the capacity to charge trucks

Sweden's transport administration, Trafikverket, has announced the location for its planned electric road, capable of charging heavy electric vehicles.

A 21km stretch of the two-lane E20 highway, between the towns of Hallsberg and Örebro, in the central southern region of the country, will include transformers and technology to transfer electricity to vehicles.

Although the technology that will be utilised on the road has not yet been announced, Trafikverket recently part-financed a pilot scheme in the municipality of Lund, with a ground-level feeding system that charges vehicles (with retractable electrical pick-ups) as they pass over it.

PILOT SCHEME

The consortium that worked on the €9.2 million pilot scheme, named EVolutionRoad, comprised Innovation Skåne (which acted as project manager), Elonroad, Krafringen Energi, Lund municipality / Future by lund, Lund University of Technology, LTH, Ramboll, Skånetrafiken, Solaris Sverige, National Road and Transport Research Institute, VTI.

The EVolutionRoad scheme has been running since 2020, gathering data from an electric bus running the route for one week in each month.

According to the agency, tender documents will soon be ready for the E20 construction project, with a final road plan set to be in place by early 2024 and construction work completed by 2026.

If the system proves a success, the government will hope it can aid in its stated aim of cutting greenhouse gas emissions from transportation by 70% by 2030. **ce**

New lab promises infrastructure shake-up

A new state-of-the-art facility is set to change the way major infrastructure projects are undertaken, according to its creators.

The UKCRIC Soil-Foundation-Structure Interaction (SoFSI)

facility has been developed by the UK's University of Bristol, to help make infrastructure design and construction more resilient and cost-effective.

SoFSI will look at the interaction of infrastructure with the



PHOTO: BRISTOL UNIVERSITY

Liebherr launches Crane Planner 2.0

The 3D lift planning software update is now features new mobile crane models

Liebherr's latest lift planning software update now includes three-dimensional lift planning which can be carried out for further LTM mobile cranes from Ehingen. In addition to the LTM 17509.1, which was already included in the program, the LTM 1650-8.1, LTM 1450-8.1, LTM 1300-6.2, LTM 1250-5.1 and LTM 1230-5.1 are now also available for planning work. Additional telescopic mobile cranes are being added to Crane Planner 2.0 at regular intervals. The update also includes the new distance tool, which enables objects such as machines and buildings to be positioned relative to each other with centimeter precision.

The Liebherr Crane Planner 2.0 helps users to identify solutions and procedures for their lifting work in advance. This enables complicated heavy lifts with crawler cranes as well as supposedly quick and easy taxi lifts by mobile cranes to be completed safely. The tool combines an interactive 3D visualisation of the machines, the loads and surrounding objects with dimensions, a positioning tool and Google Maps, without the need for expensive CAD programs or high-performance computers, the company said. The results of the planning process can be exported in the form of a report and sent to the customer.

The data displayed in Crane Planner 2.0 are determined using exactly the same calculation logic as the live data generated by the real mobile and crawler cranes. Key data such as ground pressures, support pressures, lifting capacities and centres of gravity are calculated simultaneously. Each time the configuration, load or geometry is changed, a new calculation is carried out. **ce**

Crane Planner combines a 3D user interface with the precise machine data of the load moment limitation system

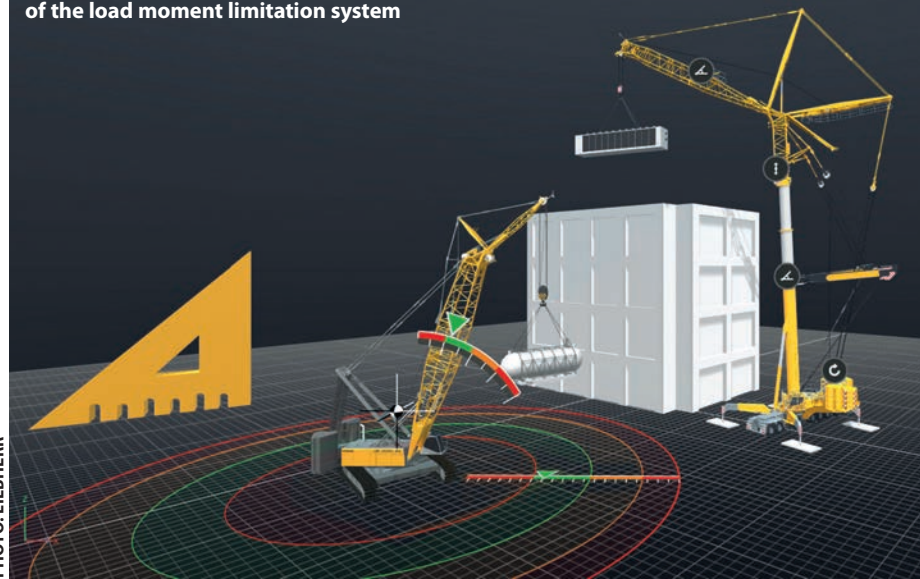


PHOTO: LIEBHERR



PHOTO: ADOBE

China recognises the importance of smart construction in its latest 5-year plan

China's plan for construction: greener, smarter, more robots

The Chinese government has released a five-year development plan for the construction industry that aims to put it on a "greener, smarter and safer path."

The plan – released as part of the 14th five-year plan, for the years 2021-2025 – states that the industry will increase the modernisation of its industrial chain, form the preliminary stages of a green and low-carbon production mode, see more widespread application of information technologies, and improve the safety and quality of buildings.

The plan also says that prefabricated buildings, which are partially or wholly manufactured in factories and then transported to construction sites for assembly – also known as modular buildings – will account for more than 30% of the country's new construction.

Technology is mentioned in the plan, specifically an increase in the use of information technologies and the mass application of construction robots in some areas by 2025.

In terms of sustainability, building waste at new construction sites promises to be lower than 300 tonnes per 10,000m².

China's construction industry is important to the country's economy – it is reported that in the period of the 13th Five-Year Plan period (2016-2020), the sector expanded 5.1% annually in added value, accounting for over 6.9% of the country's gross domestic product (GDP).



A wide-angle view of the SoFSI facility

ground, specifically when subjected to dynamic loads, be they, for example, weather- or traffic-related.

The laboratory houses a 6 m x 5 m x 4 m deep soil pit, as well as two large shaking tables, one with a 50-tonne capacity, the other a high-performance six-axis table (see the

video at the end of the article). The facility will enable researchers to undertake close-to-prototype-scale experiments.

Open to both academic researchers and the construction industry, the facility was built with €14.4 million in funding from the Engineering and

Physical Sciences Research Council (EPSRC).

The lab has been designed for research into five core areas: nuclear power plant soil-structure interaction, high speed rail, offshore wind turbines, monopiles and pile groups, and integral bridges.

OUTLOOK FOR UK CONSTRUCTION



UK construction is emerging from the Covid pandemic relatively strongly, but is not, as Scott Hazelton of IHS Markit reports, without its challenges

The UK economy is slowing with real GDP growth retreating from a likely 6.9% pace in 2021 to anticipated growth of 4.0% in 2022. This does imply that the country will regain the 9.7% loss of GDP in 2020 by mid-2022.

Real GDP growth stalled in October 2021, even before the emergence of the Omicron variant. While lockdowns have not been re-implemented, tighter restrictions further impede the recovery of hospitality and leisure sectors from past lockdowns.

The immediate real GDP outlook is challenged by rising energy prices and increased tax burdens for UK households. The recovery also faces growing obstacles from disrupted supply chains and acute labour and fuel shortages, particularly in the haulage, hospitality, and food-processing sectors.

Meanwhile, the Bank of England (BoE) has begun

tightening to tame inflation. The first interest rate increase occurred in December 2021, with two further rate increases expected in both 2022 and 2023.

SOLID CONSTRUCTION

On the construction front, recent evidence remains somewhat positive. At 54.3, the December IHS Markit Construction PMI data indicated growth and remained above the 50.0 no-change threshold, but the index was down from 55.5 in November and signalled the weakest rate of expansion since September.

Higher levels of new work have now been recorded for 19 consecutive months, but there is some evidence that tighter pandemic restrictions and rising Covid-19 cases negatively impacted construction activity, especially in the commercial sector.

On the plus side, the number of construction firms reporting supplier delays dropped from 47% in November to 34% in December, suggesting that supply constraints may be ameliorating – this was the least marked downturn in supplier performance since November 2020.

Higher fuel, energy and raw material prices continued to push up average cost burdens

across the construction sector in December. However, the overall rate of inflation eased for the fourth month running to its lowest since March.

Looking ahead, just over half of the survey panel (51%) forecast a rise in business activity during 2022, while only 9% predict a decline.

The outlook for UK construction is for continued, but slowing, growth. Total construction spending likely recovered 4.2% in 2021 after a precipitous 15.5% drop in 2020.

IHS Markit expects growth to moderate to 2.1% in 2022 with a bit stronger bounce to 2.8% in 2023. Between economic headwinds and uncertainty of the UK's trade relationship with the EU, construction growth will remain challenged and UK construction spending will not re-attain 2019 levels in real terms until 2025.

However, given inflation, which is high by recent historical standard, 2019 nominal levels will be achieved in 2023.

ABOUT THE AUTHOR

Scott Hazelton is a director with the Global Construction team at the market analyst IHS Markit. Scott has over 30 years' experience in construction, heavy equipment, building materials and industrial manufacturing markets.



CE BAROMETER Current challenges fail to dampen long-term optimism

The barometer survey for the month of December 2021 was undertaken during the first three weeks of January 2022.

In general, construction was relatively slow at the end of 2021, with the triple whammy of Covid measures, supply chain issues and skills shortages negatively affecting both the speed and cost of projects.

For these reasons, the balance figure for this month (the difference between those reporting positive and negative movement, when comparing November and December, 2021) has fallen to -6.9%, its lowest point since February 2020.

Given that last month's barometer saw a negative result of -1.5%, this consecutive fall could be seen as a sign of trouble ahead.

FIGURES POINT TO CONFIDENCE IN GROWTH

In fact, respondents reported that business was still improved from the same time last year – and further reported that they expect it to

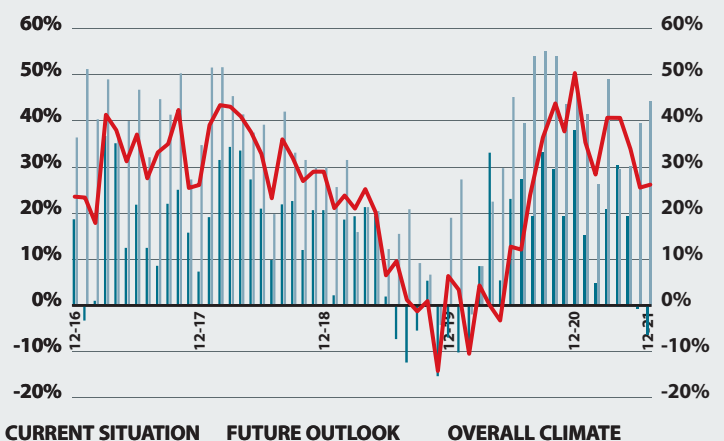
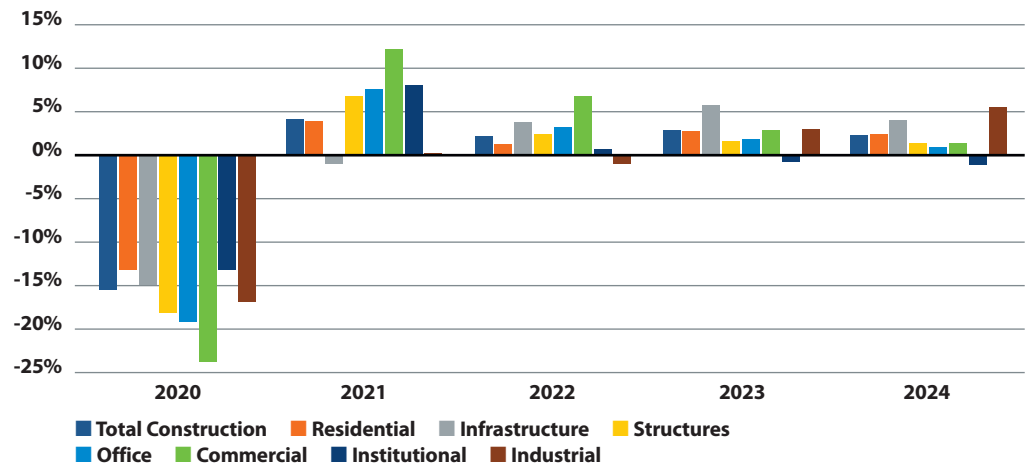




PHOTO: ADOBE IMAGES

OUTLOOK FOR KEY CONSTRUCTION TYPES
(PERCENT CHANGE, REAL 2015 UK £)



'TEPID' GROWTH

Most construction segments experienced recovery in 2021, with the exception of infrastructure where every element – transportation, energy and water/sewer – saw very modest retreats.

Residential is the largest construction segment and experienced a decent recovery in 2021, with 4.0% real growth. Inflation was strongest in this segment with nominal growth of 12.8%.

In simple terms, one can

use nominal growth as an indicator of the increase in construction business revenue, while real growth would closely approximate the outlook for square metres of construction.

We do expect both nominal and real residential growth to remain tepid over the forecast as high housing costs combine with increasing interest rates and overall consumer inflation to limit

housing affordability.

While residential construction growth usually leads the overall market, it will only roughly keep pace with the average over the next few years.

The broad non-residential segment will perform on a par with residential construction over the near-term. The industrial segment will be challenged, however, with uncertainty around Brexit, transportation and supply chain issues weighing on the business confidence necessary to justify future expansion.

As these issues are resolved in 2023 and beyond, construction of industrial structure will progressively improve; indeed industrial construction is projected to lead market growth by 2024. Commercial is the near-term beneficiary, but this is partially due to base effects.

As the Covid-induced downturn disproportionately impacted hospitality, any recovery from the steep drop will drive outsized growth. A further hindrance to growth will be the evolution of the retail sector.

As e-commerce continues to consume an ever-larger share of wallet, conventional store growth will subside. While warehousing and logistics will see strong growth, the value of these structures is less than that of retail with a net negative effect.

It will be 2026 before this market recovers to its 2019 size in real terms. Office will be similarly impacted.

While there will be a return to office, the proven ability of some professions to work from home will reduce the necessary office space for employee. It will

take several years to rationalise the current office stock with projected employee in-office hours.

REGIONAL VARIATIONS

Infrastructure also recovers as the end of Covid-support spending allows for funds to be re-purposed, particularly into transportation projects.

Nevertheless, deep fiscal challenges await to close significant wide public sector fiscal shortfalls, with the process to repair the accounts to gather significant momentum in 2023–26.

This will exert some resistance to the public spending that drives most UK infrastructure.

Looking at the UK by region, Northern and Eastern England have led growth over the past five years, closely followed by London.

The disproportionate impact of the pandemic in 2020 can distort the historical data. More importantly, looking ahead, the strongest growth in construction spending is expected in London, which already had a very strong 2021.

East of London and the Midlands are also poised for strong growth. However, the Midlands were the hardest hit region in 2020, so some of the strength is base effect – a recovery from a low level.

Wales and Scotland have the strongest turnarounds from the past five years. For Wales, this is also something of a base effect from a tough 2020, but for Scotland, this is a true, sustained strong outlook with sustained growth in the 4% to 5% range for the medium term.

PERFORMANCE AND OUTLOOK BY UK REGION
COMPOUND ANNUAL GROWTH (%)

	CAGR 2016-2021	CAGR 2021-2026
LONDON	2.6%	5.6%
EAST	3.0%	5.2%
NORTH	3.1%	3.7%
SOUTH	0.0%	4.1%
MIDLANDS	2.2%	5.2%
SCOTLAND	-2.0%	4.8%
WALES	-4.3%	4.4%

CE DECEMBER 2021 SURVEY RESULTS

be better still a year from now.

Looking back, 54.2% of respondents reported improvement from a year ago, with only 12.5% claiming business is now worse. Similarly, 56.9% of respondents predicted that business will go on to improve in 12 months' time, while, again, just 12.5% expect things to be worse.

Overall, the business climate now stands at 26.4%, a fractional improvement on last month's 25.9%, but well behind the 50.7% high of last May. A reality check, perhaps?

TAKE PART

The survey, which takes just one minute to complete, is open to all construction professionals currently working in Europe.

■ See www.construction-europe.com/ce-barometer for more info.

THE NEED FOR NET ZERO

The climate emergency means the construction industry must evaluate its carbon footprint and develop processes that meet wider sustainability targets and European initiatives - and quickly. Cat Jones reports

Volvo Construction Equipment (CE) is a world leader in the development of compact electric machines for the industry

The recent COP26 summit – held in Glasgow, Scotland – demonstrated that sustainable infrastructure was necessary to reduce the 39% of energy and process-related carbon dioxide (CO₂) emissions for which the construction sector is responsible. To achieve a net-zero future, the sector has a responsibility to reduce its carbon footprint and improve the sustainability of the built environment.

To help companies act, the Science-Based Targets Initiative (SBTi) – a necessary measure to meet the goals of the Paris Agreement – drives the private sector to take critical climate action by setting science-based

targets to reduce emissions.

Volvo Construction Equipment (Volvo CE) says it is heavily committed to this initiative, and it is in line with the company's long-term ambition to achieve net-zero value chain emissions by 2040, with significant emission reductions anticipated as early as 2030.

COMMITTED TO CHANGE

The target of net-zero value-chain greenhouse gas emissions by 2040 is a united commitment for Volvo Group across all the business areas and is set for 10 years earlier than the SBTi commitment, says Marcus Karlsson from Volvo CE Sustainable Power



Volvo Construction Equipment is targeting net-zero value-chain emissions by 2040

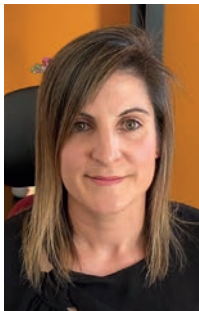


...raw materials will be kept longer in their cycles, and this will further fulfil our sustainability commitments.”

Systems. This is due to Volvo products having an average life of 10 years in the customer use phase. For the entire rolling fleet to have net-zero emissions by 2050, it is necessary that all products delivered after 2040 have net-zero emissions.

In the meantime, Volvo CE has also set its

Carolina Diez Ferrer, head of advanced engineering programmes at Volvo CE



own interim goals to be met by 2030. These include cutting emissions in half in its operations, facilities, and manufacturing processes, and achieving 30% in absolute reductions in the use of its products.

Carolina Diez Ferrer, head of advanced engineering programmes at Volvo CE, explains how the company is also focusing on the impact it can make in its warehouses and facilities. “We are investing in solar-panelled cells in [our] warehouses and are looking at the other options available to us,” she says.

“One of our focuses is also on building a circular economy – raw materials will be kept longer in their cycles, and this will further fulfil our sustainability commitments.”

HYDROGEN POWER

In a bid to meet sustainability targets, companies are redefining diesel-fuelled machinery and reassessing the impact these have on the environment.

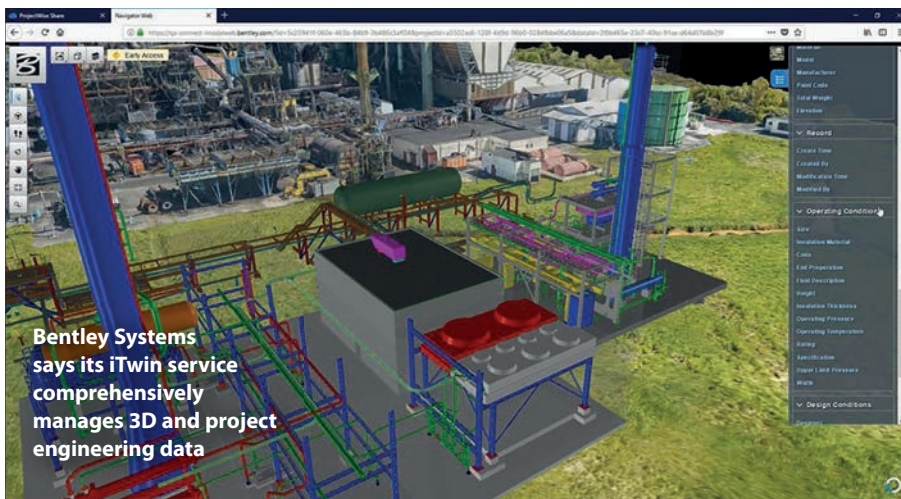
Marcus Karlsson says, “Volvo has introduced compact electric machines and we are developing light to medium segment machinery that is electrified with battery.”

While battery-electric solutions are ideal for urban construction and other use cases, the size of the batteries is generally too impractical for larger machines and heavy construction equipment, says Karlsson, which is where Volvo CE believes hydrogen comes in >





Robert Spencer,
environmental, social and
governance lead at Aecom



Bentley Systems
says its iTwin service
comprehensively
manages 3D and project
engineering data

WHY SHOULD DIGITAL TWINS BE USED IN CONSTRUCTION?

Digital twins and digital twin methodologies can apply to all phases of a structure's lifecycle. The earlier that a project starts with digital twins in mind, the richer the data and insights, says Brian Robins, Bentley Systems' VP of product and industry marketing.

"In terms of construction, we can aggregate the source data into a construction digital twin, which includes the design data and the construction information added during preconstruction planning. With the use of mobile devices for data capture, we can receive feeds from the construction operation including sensors, drone capture and overall site progress."

Digital Twins can have a significant advantage in the early stages to ensure the build is mindful of its surroundings. Rich Humphrey, Bentley's vice president of construction, adds, "Digital twins can help minimise the destruction on the environment by giving you the ability to virtually plan the build and determine how the infrastructure will affect the surrounding area."

Additionally, linear design models of a project can be easily broken down into design components or parts and then be used to create a construction schedule based on, for example, how many people are needed and when they are needed.

Robins adds, "We can use digital twins for QTO [quantity takeoff] to estimate what manpower and material you will need to get your project off the ground. This labour and material cost determination, which is usually done manually, can now be automated to calculate cost estimates for material quickly and easily."

"Digital twins help users make data-driven decisions and achieve predictable results. All construction-related information is available in one place, including asset tags, work orders, maintenance records, inspection records, and work schedule details. Everyone involved in the project can exchange project data and information between the construction site and the office and access it at both locations. The project team has all the tools and information needed to perform analysis and use the intelligent data to make informed decisions."

In the case of iTwins, Bentley believes its digital twin technology will extend over the entire lifecycle of the project, from planning to execution and operation, so that users can improve collaboration and make more informed decisions and achieve better results in all phases.

According to Robins, iTwins allow users to simulate logistics and project schedules, track progress, complete status reviews and view an up to date 4D model.

He says, "All the sources of data discussed – some static but many near real-time – make up a rich project digital twin valuable for linear projects and horizontal construction projects. A digital twin allows for project visualisation which enables users to quickly run construction sequences and simulations so that they can identify and correct errors before construction starts."

"Project teams reduce the overall time on site by conducting the project analyses before going to the construction site and, thus, reducing the costs for the client."

Bentley's Synchro 4D modelling technology enables the end-user to plan, schedule and control the on-site aspect of a project, both virtually and visually. Robins believes that all these functions result in a step function improvement in productivity.

This sulfuric acid plant utilised digital twin technology to lower the cost of materials and cut months off its construction schedule



as a promising alternative.

Volvo CE sees hydrogen fuel cell technology playing a key role within its overall electromobility ambitions, together with battery-electric solutions, as demonstrated by the electric compact machines, and more sustainable internal combustion engine offerings – with all three streams working in alignment on the journey towards a carbon-neutral society.

DECARBONISATION OF THE UK

Balfour Beatty has recently announced that the Technip Energies and General Electric Gas Power consortium, in which the company is the construction partner, has been selected by BP to participate in a Front-End Engineering Design (FEED) competition for the Net Zero Teesside Power, Capture and Compression project.

The FEED competition will see Balfour Beatty assist in the design and development of optimal technical solutions for Net Zero Teesside Power's planned 860MW power station and carbon capture plant, as well as the Northern Endurance Partnership's high-pressure carbon dioxide compression and export facilities.

Stephen Tarr, chief executive officer of Balfour Beatty's major projects and highways business, says the project "represents a significant milestone in the decarbonisation of the UK," adding that, along with consortium partners, the company was "harnessing the spirit of collaboration" to tackle the climate change challenge.

CURBING CARBON EMISSIONS

With the built environment accounting for 39% of carbon emissions globally, it begs companies to ask themselves – what are we doing to reduce this? Robert Spencer, environmental, social and governance (ESG) lead at Aecom, believes the ScopeX process is a valuable tool to help end the climate crisis by reducing carbon through clever design.

He says, "We launched our ScopeX solution with a goal of reducing embodied and operational carbon in the built environment that we can control or influence by 50%, particularly through design. We look at all areas of a project to minimise carbon emissions including materials, energy, and

V O L V O



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A render of Net Zero Teeside – a major carbon capture, utilisation and storage project in the UK



Q&A WITH RAMBOLL

how we can work with natural habitats to enhance them and sequester carbon.

“This work has already started with some pilot demonstration projects and a basket of tools and dashboards to support the embedding of this carbon literate mindset across our engineering community.”

ScopeX aims to utilise customised technical approaches combined with a range of digital solutions to deliver significant tactical opportunities for lifecycle carbon reduction. Aecom is bringing together various internal and external processes to support this effort, including developing digital tools to quantify carbon impacts and provide optioneering and benchmarking, developing knowledge repositories to quickly upskill their technical staff, adapting internal processes to drive decarbonisation discussions into project delivery, and identifying collaborations with partners to address knowledge gaps that exist in the industry.

The manufacture of building materials and products, such as steel, cement and glass, combine to produce 11% of the construction industry’s carbon emissions. Aecom says more focus needs to be placed on implementing low carbon materials into projects to reduce this figure.

Spencer believes this is an area in which Aecom is excelling, saying, “We have a pavement engineering and construction materials laboratory at our UK Nottingham offices, which is dedicated to investigating the application of low carbon and recycled material content into real pavement environments for our road, rail and aviation clients. The team at our lab has been behind the pioneering use of warm mix tarmacadam and recycled content for airport pavements, for example.

“We also foster infrastructure client collaboration on this vital issue. We convened the Infrastructure Decarbonisation Forum (InDeFor), a client collaboration group for

IS RAMBOLL CHANGING THE WAY THEY BUILD (USING NEW TECHNOLOGY TO MAKE PROJECTS MORE EFFICIENT)?

Yes, we are designing modular or pre-fabricated buildings whenever feasible to decrease overall costs and improve quality.

IS RAMBOLL LOOKING AT LOW CARBON MATERIALS?

Going forwards, we will be specifying the materials with the lowest carbon footprint are used in our designs. For many materials (like concrete, steel, aluminium and insulation) there are lower carbon options available at no additional cost, but if you do want materials with a dramatic carbon reduction you could end up paying a premium. Ultimately, our clients are having to strike a balance between costs and carbon.

HAS THE EUROPEAN GREEN DEAL CHANGED ANYTHING FOR RAMBOLL ON A DAY-TO-DAY BASIS?

The European Green Deal is leading to a lot of new regulation that will dramatically change the construction sector. New regulation, such as EU Taxonomy reporting, the Energy Performance of Buildings

Directive, and Circular Construction initiatives will have a significant impact on the sector, particularly for suppliers of materials and components – those who cannot offer a low carbon option in the future will soon find they have no market.

The North Zealand Hospital - an example of design that focuses on social, economic and environmental sustainability PHOTO: RAMBOLL



our major UK-based infrastructure clients. We recently held a dedicated session on low carbon materials with a particular focus on alternatives to concrete, steel, and asphalt in infrastructure.

“When considering low carbon materials, we believe priority should be given to the management of assets and infrastructure in a way that extends their service lives and reduces lifetime carbon.”

WILL TECHNOLOGY IMPROVE SUSTAINABILITY?

As technology advances, companies must develop and adapt accordingly while

remaining conscious of environmental concerns and surrounding issues. Spencer is aware of the benefits of optimising projects through technology and embedding sustainability into what Aecom does to meet targets.

“We’ve recently launched Digital Aecom, bringing together our flagship digital innovations, tools, systems and processes which together transform programme management and delivery. We do this through supporting clients in their digital strategy, design and operations, embedding and optimising digital solutions and use of data analytics and AI.”



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NEW ROADS NEW METHODS

The importance of improving Europe's transport network in a sustainable way has resulted in huge spend and increasing demands on road construction companies, as Mike Hayes reports

Vinci Autoroutes recently announced the completion of a €561 million project to build a new 24km-long bypass in France.

Not so unusual, you might think, yet very little about the construction of this road was 'usual'. For example, no less than €130 million of the total cost of the A355 in Western Strasbourg went towards environmental integration.

To offset the negative environmental impact of its construction, 1,315 hectares (13,150,000m²) of land was 're-natured' to allow biodiversity to flourish. In fact, the 're-natured' area is approximately 4.5 times greater than the area covered by the road –

and the bypass itself includes 130 passages that allow safe crossing for wildlife.

Furthermore, through the rerouting of up to half of the heavy goods vehicles that use the A35 motorway (renamed M35), Vinci says the A355 will save up to 10 million hours of time lost by drivers each year, helping to lower air and noise pollution in the area through shared, low-carbon mobility solutions.

Vinci called the project a "new generation highway" and said it was "the culmination of a project

**The A335
Western
Strasbourg
bypass in France**

PHOTO: VINCI AUTOROUTES

KEEPING IT ON THE LEVEL

Construction technology specialist Trimble has added horizontal steering control functionality to its Earthworks Grade Control platform for soil compactors.

The company says the new functionality is the first of its kind in the industry and marks a step towards its vision of autonomy in the sector.

One of the things that makes it stand out as a product is the fact that the system is compatible across all makes and models, giving contractors with mixed fleets the opportunity to benefit from the technology.

The company says the upgrade – which allows operators to focus on grading, while the compactor travels on an optimal pre-programmed route – has the potential to boost performance and cut costs, significantly reducing overlap and the total number of required passes.

Scott Crozier, general manager of Trimble Civil Construction, says, "It's difficult to steer a soil compactor with accuracy and consistency, but over- or under-compaction leads to wasted time and materials and less durable surfaces.

"Horizontal steering control allows operators to focus on machine performance and safety and deliver a higher quality, more consistent surface."



Trimble says steering control functionality is a step on the road to autonomy PHOTO: TRIMBLE

launched in October 2018 after three years of studies and preparatory work, which involved 6,000 people and over 300 companies."

The demands on road construction businesses reflect the demands being placed on highways authorities to make roads more sustainable.

HOW THE WHEELS OF INDUSTRY KEEP ON TURNING

In the UK, for example, public sector spending on roads reached some €13 billion in 2020/21, an increase of close to €1 billion on the previous year.

What's more, the UK government is moving

forward on a €32 billion programme of roadbuilding over the next five years, with plans for a wider infrastructure strategy beyond that date. The plan is considered the country's largest ever investment in strategic roads.

In England, the government-owned National Highways agency is working on a Digital Roads 2025 initiative, aimed at harnessing data, technology and connectivity in an effort to improve the construction and use of the country's road network.

Nick Harris, National Highways' chief executive, says, "We are at the beginning of a digital revolution in roads infrastructure

and expect to see more change in the next decade than we have in the last century." Elements of the plan include digitally enabled design, modular approaches to construction and fabrication and automated construction.

ELECTRIC AVENUE

Another example comes from Sweden, where the country's transport administration, Trafikverket, recently announced the location for its planned electric road, which will be capable of charging heavy electric vehicles.

If the system proves a success, the

Control your Roll

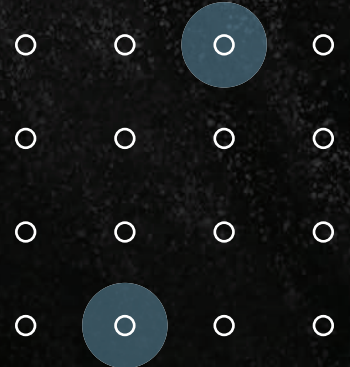


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Vögele's RoadScan system was used to monitor paving temperatures on the Aftetal Bridge project in Germany
PHOTO: VÖGELE

READY FOR GREENER ROADS

When one of its asphalt mixing plants in Germany needed renovating, Makadamwerk Schwaben GmbH & Co knew advanced ecological features were a priority.

The company called on Swiss mixing plant specialist Ammann, with specific interest in its HRT (high recycling technology) concept.

These plants are able to process up to 100% recycled asphalt, using a hot gas generator, the temperature of the recycled material is carefully raised inside the counterflow recycling dryer RAH100, with a large steam disposal system allowing for both hot and cold recycling.

With the system placed directly above the mixer, only gravity is used to move the material, reducing the energy input and minimising wear.

Ammann adds that HRT plants are able to produce special mixes, such as mastic asphalt, can be produced without any special requirements.

The new plant was opened in September 2021, and the company's production capacity has now reached 320 tonnes per hour.



To produce low-temperature asphalt, the plant is equipped with an innovative bitumen foam additive
PHOTO: AMMANN



government will hope it can play its part in cutting greenhouse gas emissions from transportation, helping it meet its goal of a 70% reduction by 2030.

The project consists of a 21km stretch of the two-lane E20 highway, between the towns of Hallsberg and Örebro, which will include transformers and technology to transfer electricity to vehicles.

Although that technology has not yet been announced, Trafikverket recently part-financed a €9.2 million pilot scheme in the municipality of Lund, with a ground-level feeding system that charges vehicles – with retractable electrical pick-ups – as they pass over it.

The EVolutionRoad scheme has been running since 2020, gathering data from an electric bus running the route for one week in each month.

According to the agency, tender documents will soon be ready for the main E20 construction project, with a final road plan set to be in place by early 2024 and construction work completed by 2026.

As Europe's roads evolve, so must the equipment and technology used to construct them.

SMARTER PAVING AS STANDARD

To achieve the stringent quality standards required by today's authorities, road construction specialists have made huge strides in the adoption of new technology.

Vögele, a company specialising in paving equipment, recently had machines employed on a project on the 70m-tall and 785m-long

The EVolutionRoad pilot electric road scheme is ongoing in Lund, Sweden
PHOTO: ELONROAD VIDEO CAPTURE



Aftetal road Bridge near Bad Wünnenberg in Germany.

The contractor, Franz Trippe, opted to use a range of Vögele technologies on the project.

The RoadScan non-contact measuring system continuously monitored paving temperatures, with current temperature data viewable via a display on the operator's console. The new Jobsite Temp app also enables the foreman and other users to access temperature data and supplementary data in real time, via their smartphones.

Current pave speeds, screed width, the positioning of the paver and the position of the mix transfer point can also be checked, while Vögele's WITOS Paving Docu technology records all jobsite processes.

Franz Trippe's managing director, Stefan Trippe, says, "We have been giving a high priority to digital processes.

"For example, we work with our own cloud solutions and rely on 3D technology in a lot of our machines to make us even more

ROADBUILDING

efficient and accurate and to meet increasing demands on quality and costs.”

MAKING GOOD POINTS

Another German roads project that has benefited from the use of technology is the busy B420 road around Fürfeld in Rhineland-Palatinate.

The contractor on the resurfacing project, Matthäi, due to the need to deliver the project quickly and to work around the issue of heavy traffic, caused by regular road closures.

Teams had to lay around 40,000m² of asphalt and binder in 1km sections, milling some 9,000 tonnes of material, before moving it and relaying it.

Traditionally, the surveying process for resurfacing a road, requires surveyors to hammer pegs into the ground at 5m intervals



Workers on the Aftetal road Bridge project in Germany check the real time data
PHOTO: TOPCON

WIRTGEN GOES BIG ON COLD MILLING WITH NEW COMPACT MACHINES

Roadbuilding equipment specialist Wirtgen has launched three new compact cold milling machine models in the one metre class for the European market.

Described as being “unique in this industry segment”, the new Wirtgen W100 Fi, W120 Fi and W130 Fi models offer working widths of 1.0m, 1.2m and 1.3m respectively.

All three models are equipped with a Stage V-compliant 265kW diesel engine from John Deere, which Wirtgen said “use significantly less fuel, even when delivering highest productivity and milling to a maximum depth of 330mm”.

The design of the new models has been based on the company’s larger F series machines and includes digital assistance systems that, according to the manufacturer, enable users to experience the same “high milling performance, efficiency and clear documentation” offered by its larger machines.

Key digital systems incorporated in the compact machines include Wirtgen’s Mill Assist machine control, which “increases milling performance and simultaneously reduces fuel, water and pick consumption and CO₂ emissions”.

Alongside Mill Assist, the new compact cold milling machine models also include the Wirtgen Performance Tracker (WPT) and the Level Pro Active levelling system.

The WPT automatically determines area performance rates, milling volumes and the fuel and water consumption of the machine in real time.

Operators of the W100 Fi, W120 Fi and W130 Fi models can access and email machine performance and consumption data reports via a 5-inch control screen inside the machines’ newly developed operator cab, which is available with up to five cameras for improved visibility of the machine and the area around it.



along the hard shoulder, then measure the transverse profile every 20m, evaluating all the photos, drawing up marking schedules and ensuring all the relevant data is documented.

Instead Matthäi brought Topcon technology to bear on the task. The team used a RD-M1 scanner on the roof of a car, which drove down the entire stretch of road in less than an hour, recording millions of points.

TAKING TECH ON THE ROAD

Matthäi’s surveying team leader Frank Pohl says, “On the basis of a thinned-out point interval of 30cm, we received a complete image of the road. We then discussed the critical zones and found solutions to various problems quickly.

“The team were able to smooth out uneven spots in the planning model that could have caused further problems and optimised the geometry in such a way that the incline of the new asphalt surface was a constant 1.5 per cent – leading to a perfect end result.”

The next step in the process was to send the completed model to the milling machinery. Topcon’s SmoothRide system uses GNSS positioning, allowing operators to mill only what is necessary, down to the millimetre.

Raimo Vollstädt, support engineer at Topcon, explains, “With SmoothRide’s components, everything is automated, allowing the milling machine to know its position on the road at all times. This saves a lot of time and means that the machine never has to be adjusted, which is especially beneficial when milling in the dark.

“What’s more, multiple machines can be set to run simultaneously, which makes the process all the more efficient, which is crucial when working to tight deadlines.” **ce**

The W 100 Fi, W 120 Fi and W 130 Fi milling machines from Wirtgen’s new compact class can be used for applications such as milling off surface layers or milling tie-ins during road rehabilitation projects
PHOTO: WIRTGEN

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COMPACTION IN FEWER PASSES

Think how much you save by eliminating a single pass of the roller. There are savings on fuel and labor costs, plus less wear on your machines. How can you still reach compaction targets but trim the number of passes? The proprietary Ammann Compaction Expert systems (ACE^{pro} and ACE^{force}) are proven tools.

THE ACE SYSTEMS PROVIDE

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- Automatic compaction output control and unlimited setting of amplitude and frequency (with ACE^{pro})
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Besides eliminating passes, ACE will help provide a homogenous surface without weak spots. You'll leave the jobsite confident compaction has been achieved and no costly rework is required.



Single Drum Rollers



Tandem Rollers



Keestrack's tracked engine unit M5, with integrated gen set which can feed several electric driven machines, resulting in lowest operational costs possible with less emission.

PHOTO: KEESTRACK



RECYCLING TO REGENERATE CONSTRUCTION

As the European construction sector transitions to a regenerative, circular economy, Leila Steed takes a look at the latest crushing and screening equipment re-energizing the market

With 2021 and the worst of Covid-19 (hopefully) now behind us, the promise of what this new year will bring is focused squarely on the environment. For the construction sector, the global drive to reduce the harmful impact of human activities is now unstoppable.

Although much of this drive is centered around the lowering fuel consumption and carbon emissions of machine engines, the whole life cycle of buildings and infrastructure has brought the importance of crushing and screening as a primary method of recycling construction materials and demolition waste to fore.

DIESEL-ELECTRIC CRUSHERS

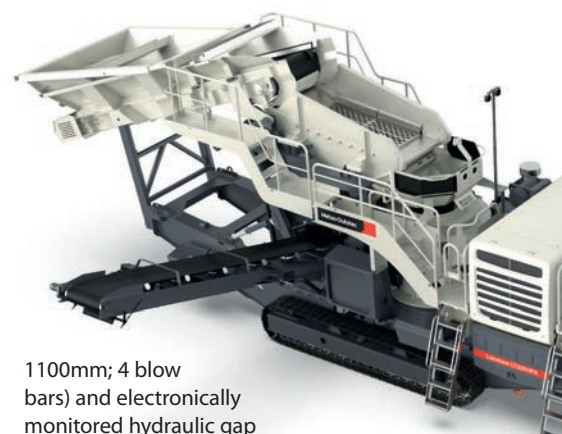
Thus for contractors, the use of the newest crushing and screening equipment will be key to achieving the recycling and environmental requirements and goals of both projects and clients in the year ahead.

Those contractors looking for high capacity crushing and screening equipment that can handle asphalt, will welcome the upcoming release of the new I4e tracked mobile reversible impact crusher from Keestrack.

Described as a "real alternative" to mobile cone crushers and vertical impact crushers by its manufacturer, the I4e crusher offers production capacity of 100 to 250t/h and is said to combine secondary and tertiary crushing into a single "highly mobile" machine.

According to Keestrack, which has over 1,000 employees and more than 115 dealers and service partners in 100 countries, the model incorporates a completely new design and can be used for both rock and the recycling of building materials such as asphalt.

"The specific design of the reversible horizontal impact crusher with a large variable crushing chamber, powerful rotor (Ø



1100mm; 4 blow bars) and electronically monitored hydraulic gap adjustment (+80 to -220mm with new tools), allows feed sizes of up to 250mm and ensures consistently high-quality end products of up to 0/2mm in closed circuit," says the company.

Featuring a diesel-electric drive concept, the model weighs 41 tonnes and incorporates a single-deck afterscreen with return conveyor.

Like the manufacturer's large H4e, H6e and H7e cone crushers and its B73 jaw crusher (B7e), the drive unit of the I4e has been designed as a removable drop-off module.

It comprises a 447kW diesel engine and a 300kVa generator with 160kW electric drives for the crusher, feeders and conveyor belts.

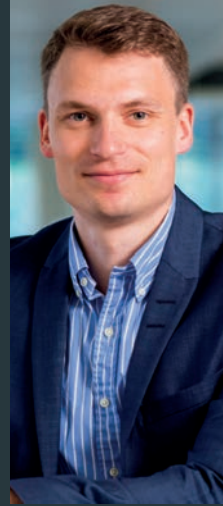
Keestrack says, "Compared to conventional



The new mobile I4e reversible impact crusher from Keestrack is designed for the recycling of building materials

PHOTO: KEESTRACK

INTERVIEW: McCLOSKEY



The start of a new year invariably involves looking forward to the future a nod to what has gone before.

For Ireland-based crushing and screening specialist McCloskey, which was acquired by Metso in 2019, adapting to change has become something of an art form.

In an exclusive interview with Steve Ducker, editor of our sister magazine *Demolition & Recycling International*, Toni Laaksonen, senior vice president of McCloskey International, speaks how the company was impacted by the pandemic and what it's predicting for 2022.

"From the business point of view, the biggest impact was here in Northern Ireland because there was a couple of months when we had to introduce the furlough scheme and keep our factories closed due to government regulations," Toni recalls.

"Luckily, we could keep the business up and running because we still had finished good inventories. So we kept delivering to the customers until we were able to start manufacturing again."

Despite the challenges of the past two years, McCloskey has continued to expand its operations with the addition of new distributors and the launch of new products, such as the I4C impact crusher, which is specifically aimed at the construction and demolition recycling, asphalt recycling, and aggregates markets.

Indeed, Toni believes that 2022 has the potential to be a "record breaking" year for McCloskey.

"From the product portfolio point of view we have introduced the new cone crusher range in cooperation with Metso Outotec and there are technologies we have been sharing in the brands that enabled us to introduce a full range of really competitive mobile cones.

"Our research and development investment are increasing. Metso Outotec is more focused on the stationary business now, and our products are all mobile. It looks really positive.

He adds, "The biggest challenges are things like do we have enough containers? How are the logistics costs between Asia and Europe? How many components are available?"

"But these are positive challenges. The more we can manufacture, the more we can sell. There will definitely be new products this year, especially in the first quarter."

diesel-hydraulic units, diesel-electric driven plants directly save up to 40% of fuel. While working in production trains, the attributable fuel consumption may even decrease by 70% when the hybrid screeners are powered directly via the plug-out supply of an upstream or downstream diesel-electric crusher.

Additionally, Keestrack's tracked engine/generator units can also be used to power the brand's connected crushers, screeners and stackers with electricity, if there is no grid supply available on site.

"This way the economic advantages of the complete production train will rise to its full potential," says Keestrack.

It adds, "when looking into the future Keestrack mobile crushers and screens can be sold even without an engine unit."

While Keestrack's new model is not due to hit the European market until later this year (no specific date has been revealed), the latest models from Metso Outotec came out in October of last year.



The ST4.10 screen can be used with the Lokotrack LT220GP

CRUSHERS FOR AGGREGATE PRODUCTION

An expansion of the Lokotrack product line, Metso's new LT200HPX and LT220GP mobile cone crushers are designed to work with construction aggregates and provide 30% more capacity than previous comparable models.

"With these new models of 300 t per hour capacity and 40 t transport weight, the customers have even more choice and flexibility to select from our cone crusher range," says Kimmo Anttila, vice president at Lokotrack Solution at Metso Outotec.

The 42-tonne LT200HPX and the 38.5-tonne LT200GP machines both have transport dimensions of 19m in length, 3m width and a height of 3.5m, enabling contractors to move the units between sites on trailers.

Described by Anttila as "a sustainable and future-proof choice for any type of aggregate production", both the LT200HPX and LT220GP crushers feature a Cat C9.3B power transmission and a two-deck pre-screen with a fine material bypass that can handle high levels of material.

Added to that, the models are also available with either H12-10 or H12-12 main conveyors, which offer an adjustable discharge height that allows contractors to use them with other machinery.

While the LT220GP is said to "fit well" with the "Lokotrack LT120/LT120E mobile jaw



Metso Outotec's Lokotrack LT200HPX can be used with the ST4.8 mobile screen



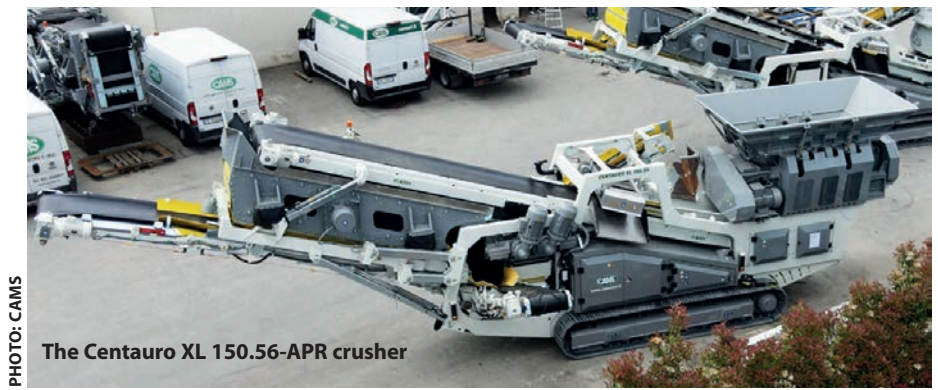
PHOTOS: METSO OUTOTEC

CRUSHING & SCREENING

crushers and ST4.10 mobile screen for high-capacity aggregate production”, the Lokotrack LT200HPX mobile cone crusher can be used with Metso’s Lokotrack LT106 and LT116 jaw crushers - as well as the Lokotrack ST3.8 and ST4.8 mobile screens.

ASPHALT RECYCLING

With an abundance of infrastructure projects in the pipeline thanks to increased government spending, machines that can handle aggregates and roadbuilding materials will be in high demand in the next couple years.



The Centauro XL 150.56-APR crusher

NEW SANDVIK IMPACT CRUSHERS

Sandvik Mobile Crushers and Screens has launched its new 3-Series equipment line, starting with the release of the third generation QJ353 impact crusher.

The third-generation QJ353 is a mid-sized tracked machine that has been designed for the recycling and contractor sectors.

It can process up to 400 tonnes of material an hour and includes PRISEC crushing technology, which enables it to be used of both primary and secondary applications.

“Its feed arrangement includes a new feed hopper with curved heavy-duty sides for greater capacity and tapered feed arrangement to reduce blockages and ensure continuous crushing,” says Sandvik.

“It also features a new pan feeder with geared drive and a larger pre-screen with improved access to replace media.”

“At the core of the QJ353 is a new mid-size Prisec impact crusher, which boasts the largest feed opening 1,170 x 730 mm (46 x 29 in) and largest rotor diameter 1,150 mm (45 in) within its class, for higher capacity & greater energy efficiency,” said the manufacturer.

“Adjustable apron curtains and tip speed ensure a wide range of product gradations can be achieved. Also, all plant conveyors have larger discharge heights for increased stockpiling capacity.”

According to Sandvik, the mobile machine is “particularly useful for contractors who change jobs frequently” and has been designed for easy operator use.

It features an automated control system that incorporates the manufacturer’s new Optik interface. Optik comprises a colour display that integrates troubleshooting, diagnostic and support capabilities, as well as the My Fleet telematics system.

Unlike the manufacturer’s second generation models, the 3-Series QJ353 has been equipped with a new access platform located under the feeder and pre-screen, and a three-sided 270-degree service and maintenance platform.

The 3-Series model is available with optional belt scales for tph (tonnes per hour) monitoring of fines and stockpile conveyors. Fitted to the machine’s conveyor, the scales allow productivity data to be displayed on the main user interface.

The QJ353 also comes factory ready to accept Sandvik’s new HS323 hanging screen module, which enables operators to use the crusher in an open or closed circuit.

Sandvik says, “The HS323 enhancements include; prepared to accept belt scales for tph monitoring on fines and stockpile conveyor belts, subframe enhanced for improved screen media access and tensioning and an updated mid-size stockpile conveyor.”

“The unique design enables set-up in less than 30 minutes and can be fitted without the use of additional lifting equipment.

It adds, “The patent pending hanging screen option delivers multi-functionality as a one, two or three-way split screener, as well as a highly productive and efficient impact crusher.”



For contractors carrying out roadbuilding and renewal projects, the Centauro L 120.56-APR and Centauro XL 150.56-APR mobile plants from Italian manufacturer CAMS can recycle 100 % of demolished road paving material and offer a zero-emissions operating mode.

Built on the design of CAMS’ existing Centauro product line, the models are the first of the company’s new Centauro APR (Asphalt Pavement Recycler) equipment range. They feature a Stage V-compliant diesel engine that can be by-passed for full electric operation with zero CO₂ emissions.

Complete with 4G connectivity, the Centauro L 120.56-APR and XL 150.56-APR machines can complete all recycling operations in a single automated cycle.

“The pre-shredding pusher system manages to grab the biggest asphalt chunks and reduces their size to help the primary FTR shredder to process all the input material (inlet plates up to 1000 mm),” says CAMS.

“The FTR itself acts as a feeder for the UVS screening system. The oversize material is redirected to the secondary CTR shredder which reintroduces the further treated





MOBILE CRUSHERS FOR SMALL CONSTRUCTION SITES

UK-based manufacturer Dragon Equipment's CR300 Concrete Crusher is currently one of the smallest mobile crushers on the European market.

That said, the tracked model is powered by a Stage V-compliant Vanguard 400 petrol engine and can crush up to 6 tonnes of concrete an hour, producing three different sizes of reusable hardcore.

"The machine is easy to use with simple controls making it easy to switch from crush to track allowing users to complete the job faster," says Dragon.

"Intelligent safety features disable crushing automatically while the machine is mobile. Simply switch back to crush when you are in the next location."

The CR300, which incorporates a built-in dust suppression system to reduce air pollution, was developed in collaboration with engine manufacturer Briggs & Stratton.

It measures just 700mm wide and weighs less than 725kg. According to Dragon, multiple tie-down points and a single lifting point makes it easy to transport between construction sites, which can be done using a standard trailer or van.

material into the screening unit, through to a closed cycle system, ensuring the recycling of the entire product."

MOBILE SCREENS

Similarly, the new MOBISCREEN MSS 802(i) EVO from Wirtgen Group manufacturer Kleemann, has also been engineered to provide a high material flow in recycling applications.

Described as a "new generation of screening plants", the MSS 802(i) is powered by a diesel-hydraulic drive but is also available with a Dual-Power drive option, which allows it to be connected to an external electric power supply for emission-free work and lower

operating costs.

It can process up to 500 tonnes of material an hour thanks to its double-deck vibration screen and a 9.1m³ capacity hopper head.

As well as incorporating a water spray system to reduce dust, the 30-tonne model also has a wide crusher discharge conveyor with adjustable speeds and a large material transfer system to the screen deck - allowing for "optimum utilisation of the screening surfaces".

Said to offer greater mobility and flexibility than the manufacturer's previous comparable models, the MSS 802(i) incorporates folding sider conveyors for reduced set-up and disassembly times, and its proportionally

controlled running gear enables it to be transported via a low-loader to other locations.

To help contractors carry out a variety of operations, the model has a hopper rear wall that can be folded to three heights, enabling it to be used with crushers that have a lower discharge height.

The unit can also be quickly reconfigured from 3- to 2-way grit, enabling it to produce two or three final grain sizes, and offers an automatic start function to reduce operating errors and user learning times.

Kleemann says, "The technology behind the screening process must be easy and safe to use for all users."

"The new plant impresses not only with technological highlights in the process sequence, but also through its ergonomic design, optimised operation and the user-friendly maintenance concept."

Indeed, the MSS 802(i) features a removable wired machine control system (as standard) that allows users to control all the machine's driving, movement and operational settings from a safe distance.

"An optimised material flow is a central aspect of all screening plants," says Kleemann. "Only if all components are tuned to one another can high productivity with minimised operating costs be achieved."

It is also available with an extended crusher discharge conveyor and telescopic side discharge conveyors for higher stockpiles, which Kleemann says ensures "ideal processes" on construction sites.

That said, every construction project will have different challenges that require their own processes.

The goods new for contractors is that both the latest - and upcoming - crushing and screening equipment available in Europe, is continuing to increase the amount and type of construction material that can be recycled and reused.

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DRONE SOFTWARE IS SAID TO ALLOW CONTRACTORS TO DO MORE WITH LESS AND AUTOMATE NUMEROUS

HCSS AERIAL STATES THAT USING DRONES FOR SURVEYING IS NOW THE INDUSTRY STANDARD

NEXT GENERATION SURVEYING

The construction surveying sector is embracing the use of digital tools such as drones. Staying current with constantly evolving technology is the only way to keep up with the ever-present pressure to increase productivity, reports

KATHERINE WEIR

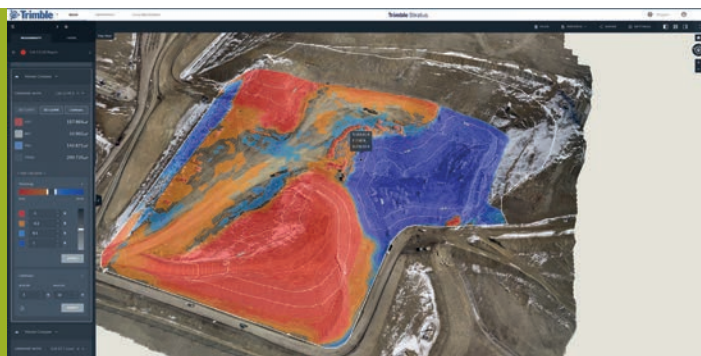
One of the most precious resources in construction is time. The digitalisation and automation of surveying is helping reduce the hours spent on a traditionally time-consuming task, without the role losing its vital place in the construction industry.

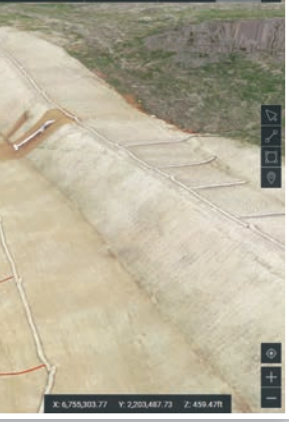
Drones are an additional aid in the surveyor's toolbox. Geared with the right equipment, software and services, surveyors are branching into new areas providing measurements, positioning and the data needed for a variety of construction services.

Rateb Almasri, senior product manager at drone software firm, HCSS Ariel, said, "Manufacturers of drone technology are



MAXIMISING THE USE OF SURVEY DATA, BOTH FOR THE CURRENT NEED AND FOR ANALYSIS OF THE PROJECT'S HEALTH INTO THE FUTURE, IS THE BIGGEST TREND IN SURVEYING





working hard to develop new designs for longer flights and increased capabilities. Drones are up to five times faster to perform surveys than traditional methods.

They can be used over any terrain. Using drones for surveying is now the industry standard; reducing time on site, increasing safety for difficult terrain, reducing 'boots on the ground' and lowering costs."

The manufacturer's drone software is said to allow contractors to do more with less and automate numerous surveying processes. Almasri said, "For example, you can track material volumes and quantities; manage stockpiles of materials, like dirt or sand for an earthwork project; you can easily determine quantities on hand – used and needed. You can also gauge the rate at which materials are used by automatically calculating the quantity change from flight to flight."

These reports by software companies are typically made available within 24 hours, allowing for more data-driven decisions and improved communication with all project stakeholders.

PROJECT HEALTH CHECK

Casey Cyrus, director of product management for Trimble Site Positioning Systems, said, "The biggest push in surveying today is around maximising the use of survey data, both for the current need and for analysis of the project's health into the future. Understanding and using



CONCEPT-X FROM HYUNDAI: NO HUMAN INTERVENTION NECESSARY

At the Consumer Electronics Show (CES) 2022 – held in Las Vegas, US, in January 2022 – Hyundai Construction Equipment and Hyundai Doosan Infracore presented its selection of 'Smart Construction'.

In relation to automated/unmanned construction sites, the Concept-X project is said to be a 'comprehensive control solution that measures and analyses the topography of the construction sites by using 3D drone scanning devices and creates operation plans based on the topography data.'

The company also claims that this is the first smart construction solution that 'successfully demonstrated the entire process from the measurement to the use of equipment to be automatically operated without any human intervention.'

There are plans to commercialise this solution by 2025, and a sequential market release is expected by completing verification in phases of individual technologies, such as topography measurement using drones.

data collected daily, weekly and throughout the project lifecycle helps in bidding new jobs and finding additional cost savings along the way.

"When it comes to the continued use of data, automation is the gift that keeps on giving. Data collected today – either manually or with automated survey systems – can be uploaded to systems for further automation. A ground-based scanning solution, for example, can be deployed to collect

its surrounding environment and can scan the progress hourly, feeding this information to the cloud where it is consumed in various ways, such as for automated progress reporting in the office or used by operators in the field to see the current state of the surface."

Cyrus states that a turning point for Trimble's construction customers was the introduction of the DJI Phantom 4 RTK. Prior to that, multi-rotor drones with PPK capability were extremely costly and required expertise to operate correctly.

"Trimble Stratus software changed that by using an inexpensive PPK drone and workflows that enabled confidence in the results, from independent checks to the end deliverables," he comments.

The pressure is on for surveying service providers to adapt new service offerings and integrate more efficient processes and technologies.

Craig Hill, vice president of geomatics and reality capture marketing and services at Leica Geosystems, part of Hexagon, said, "With increasing needs to design, plan, construct and maintain better and quicker, there will be increasing opportunities for surveying businesses providing services to construction companies."

The company's GS18 I captures images and measures hundreds of points within



LEICA GEOSYSTEM'S GS18 I CAPTURES IMAGES AND MEASURES HUNDREDS OF POINTS WITHOUT NEEDING TO PHYSICALLY REACH THOSE POINTS

SURVEYING: DRONES AND SOFTWARE

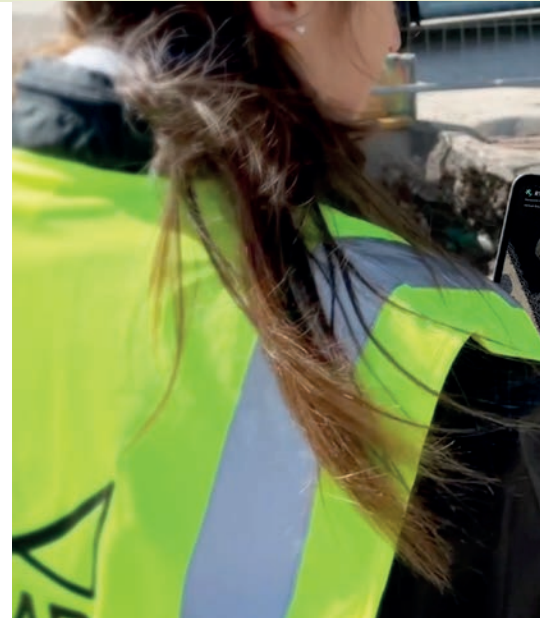
minutes without needing to physically reach those points. There's also Leica Geosystems' most recent unmanned aerial vehicle (UAV) technology, the BLK2FLY, which captures building exteriors, structures, and environments to create 3D point clouds while flying.

"Before the launch, UAV technology was mostly based on photogrammetry – now, the BLK2FLY is the world's first UAV with fully-integrated LiDAR," said Hill. "It is an autonomous flying laser scanner with advanced obstacle avoidance for easy reality capture from the sky."

USING OLDER METHODS

Topcon Positioning Group claims that, with automated technology, it's now possible to verify up to 99% of as-built construction accuracy in a fraction of the time it would traditionally take to spot check just 5% of the build.

Leighton Davies, regional sales manager for geomatics at Topcon, said, "In surveying, the main area of automation we see is with data gathering, with scanners and hybrid total stations able to collect data efficiently and share it with digital workflow solutions; all of which can be controlled remotely. This combination



offers a digitalised future for surveying, with the cloud able to communicate data in easy-to-understand forms across entire project teams and with clients.

"However, with surveying being such a traditional part of the construction process, there are many businesses and whole territories that are still using older methods, including planting stakes in the ground. It's important that the entire industry is aware of the possibilities of advanced solutions, especially ones using automation, as they really can revolutionise ways of working."

Davies also impressed the importance of those working in surveying understanding that the job is changing.

DIGITAL SITE VISUALISATION KEEPS THE PROJECT ON TRACK

NCC, the Scandinavia-based building and construction firm, recently undertook rebuilding the Drammen railway station. Part of the new 10km double-track from Drammen to Kobbervikdalen, the completed railway will provide one and a half million inhabitants in eastern

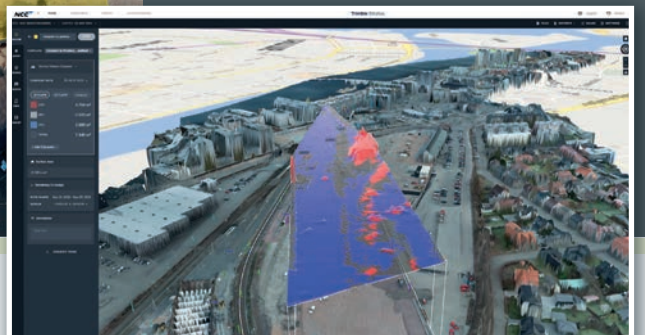
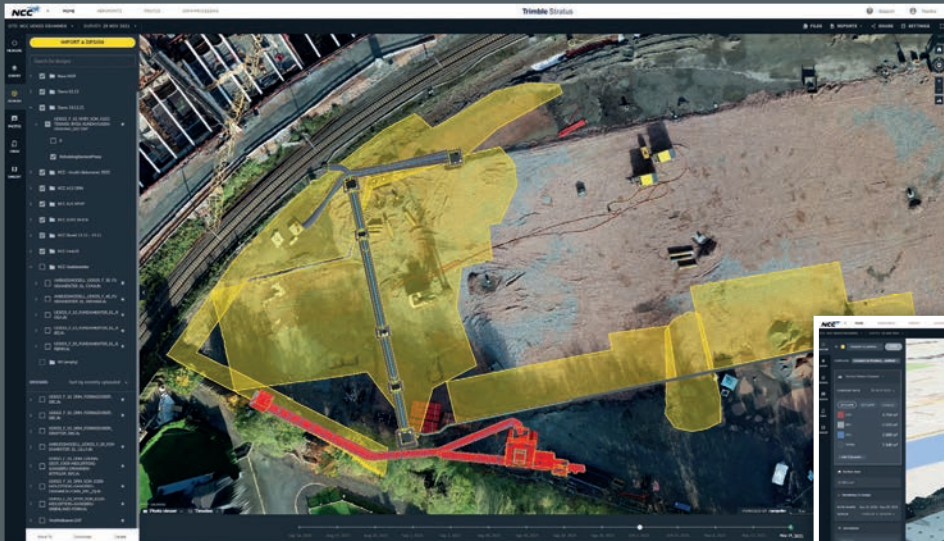
Norway with shorter travel times and more departures.

The project includes building platforms, pedestrian underpasses, a waterfront promenade and parts of a new city bridge spanning the track area, all while the railway is still in operation. Communication between many

subcontractors about a worksite this large meant the project was prone to miscommunications, disputes and delays. NCC's Infrastructure team elected to tackle these issues before they had an opportunity to develop.

Leveraging Trimble Stratus, powered by Propeller, NCC shares up-to-date, survey-grade digital maps of the entire site with all teams. The map, updated each time NCC surveyed with a drone, shows a visual timeline of data that's inarguable, leading to a significant reduction in disputes across the project.

Maria Melfald, head of surveying, NCC, says, "Surveying via drones improves efficiency, but we also save an average of four-six hours in direct processing time for every survey processed through the platform, as well as cut down the results turnaround from three-four weeks to just a few days."





PIX4D'S MOBILE APP PIX4DCATCH USES YOUR PHONE OR TABLET CAMERA TO TAKE PHOTOS WITH THE CORRECT AMOUNT OF OVERLAP NECESSARY FOR RECONSTRUCTION



MASS AUTOMATION, COMBINED WITH THE KNOWLEDGE OF SURVEYORS IS CREATING A NEW WAY FOR CONSTRUCTION TO MOVE INTO THE FUTURE, SAYS PIX4D

In terms of technology in this sector, there have been suggestions that other software may mean that, in the future, perhaps drones won't be needed. Is there truth in this?

"Drones are really just getting started and are here to stay," says Burcin Kaplanoglu, vice president, Oracle Industries Innovation Lab. "They can capture tons of images that would not otherwise have been possible and feed that data back into other intelligent construction and surveying systems."

Kaplanoglu adds that another exciting development is laser scanning. "In 2020, we were building the Oracle Industries Innovation Lab outside of Chicago, US. As part of the build, we collaborated with Faro Technologies to enable a semi-autonomous workflow of laser scanning with the integration of Boston Dynamics' Spot robot.

"This workflow carried the laser scan data into a common data environment within Oracle Construction and Engineering project management solutions. This enabled project teams to visualise the data in Reconstruct, which does remote quality control and progress monitoring.

"This is a real-world example of how these technologies changed the surveying and build process at a time where keeping crews remote was never more important."

Surveying equipment and software company Microdrones state that drones are an additional tool for surveyors. They don't replace traditional methods nor manned aircraft, but complement those tools. Mike Dziok, vice president, global marketing at Microdrones, said, "Depending on the project, drone survey equipment may make a job easier, safer or richer in data collection points compared to these methods.

"Increasingly, survey and construction companies are finding drone survey equipment to be a very effective and powerful tool. As software continues to develop and evolve, it doesn't seem that software would replace drones,

but rather increase the speed and efficiency of processing the data collected by drones."

AFFORDABILITY IMPROVING

Drone technology in construction surveying has been historically expensive. Has this improved over time? Dziok said that the technology for drones, sensors, software and tools is constantly evolving and improving, along with becoming more affordable.

"In 2020, we rolled out our Microdrones as a Service programme that works to meet a multitude of customers where they need to be today in terms of adopting this technology.

"Through this, users have the option to buy drone survey equipment or rent it. In terms of software and data processing they can subscribe

or do a 'pay as you go' plan. Depending on the volume of data they are collecting and processing, there is a plan that makes sense."

Photogrammetry software company Pix4D says that hardware pricing is coming down, making things like mobile mapping and laser scanning much more attainable for the average survey and construction company.

Ryan Sweeney, product manager, PIX4D, said, "There have also been a lot of great new entries into the affordable GNSS receiver space as well. Newer, better software to manage and take advantage of captured data from providers like Autodesk, Skyward, and Pix4D has been a brilliant new addition to the surveying world.

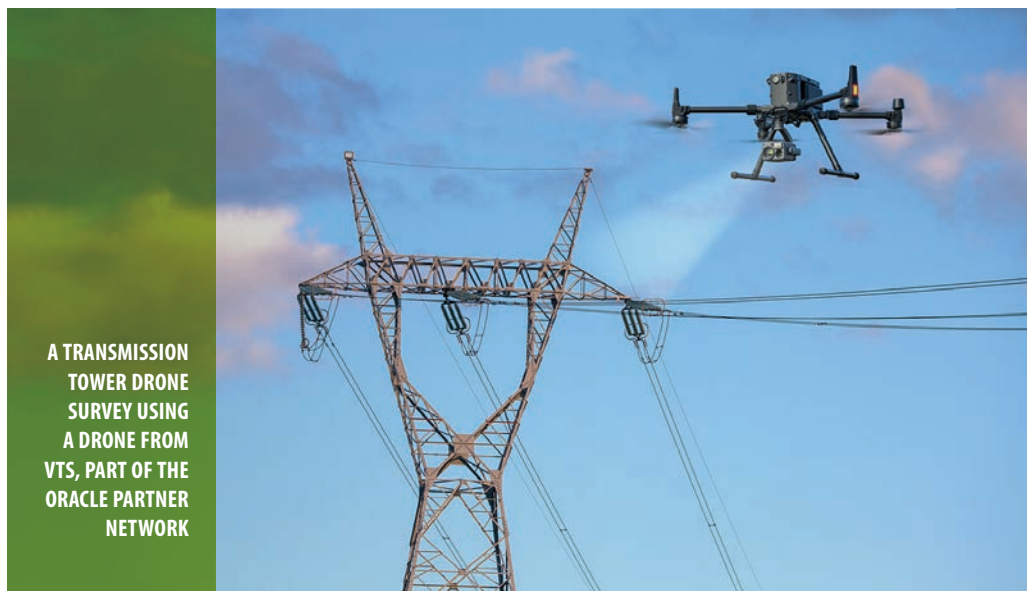
"Cloud services to make all this data more accessible and easier to use for everyone involved have been a welcome development for many surveyors, and those on the more cutting edge are even starting to bring in AR/VR headsets to help get the best possible view of their projects.

"The newest, and one of the most exciting developments, is the evolution of mobile devices which means – with the right application – phones can now measure distances with LiDAR too. When combined with cloud services and photogrammetry, it means we can get accurate 3D models on-site in a few minutes."

To enhance results alongside drones, or to even be used in place of drones, Pix4D's new software – mobile app PIX4Dcatch – uses a phone or tablet camera (and LiDAR sensor on supported devices) to take photos with the correct amount of overlap necessary for reconstruction, the company said. Instead of sending a drone up to survey a pile, you walk around it with your phone, upload it to the cloud, and get the stockpile quantity in a few minutes.

Sweeney states that, "It's a sector that is seeing mass automation, and when that is combined with the knowledge of surveyors, it is creating a new way for construction to move into the future."

CT



A TRANSMISSION TOWER DRONE SURVEY USING A DRONE FROM VTS, PART OF THE ORACLE PARTNER NETWORK

JOBS FOR THE BOYS?

Holly Price, a director at British demolition firm Keltbray, struggles to remember her working life before the pandemic.

"I don't know how I managed to physically get to so many meetings and to travel so much," says the director of skills and communities, an explosives engineer by training who, until recently, also acted as president of the National Federation of Demolition Contractors.

"The pandemic has showed us all that we can use technology like Zoom and Teams and I think that has been really beneficial for my work-life balance," she says. "Now, if I can get online, I can work."

Price, who started her career in the demolition sector aged 17, trained as an engineer and worked her way up to become the first female explosives expert in Europe in the sector, also works to promote diversity and attract newcomers of all backgrounds to the sector which is typically seen to have one of the most macho cultures in construction.

"I would argue that the pandemic is a golden opportunity to re-balance the construction industry as a whole," Price says. "In the past construction companies have not always approached jobs with flexibility in mind. We haven't questioned whether it is necessary to have every member of a team on site for ten hours a day. Covid has proved that some people can work remotely."

Although she stresses that it is still too early to really know what the full effects of the pandemic have been on everyday life and that many demolition jobs by their very nature must be performed on site, Price says that the restrictions forced on firms could provide a very much needed kick to help the industry attract and retain more women.



POST-PANDEMIC BOOM TO LEAD TO MORE DIVERSITY

Nevertheless, experts in Sweden say the pandemic is helping existing efforts to diversify the industry.

"The pandemic has been an

Holly Price of demolition specialist Keltbray

"If you had asked about flexible working two years ago, I think most employers wouldn't have understood what you were talking about and if they did, they would have said absolutely not," she says. "Presenteeism has been a big problem in the construction industry."

"Things were beginning to change before covid, but the pandemic has meant that people are more open to opportunities in the sector," says Price.

Price's view seems at odds with the situation at the beginning of the pandemic where more women than men dropped out of the workforce in order to buffer a sudden loss of childcare and shoulder the burdens of home schooling, which created what some economists have dubbed a "she-cession."

Certainly, the need for more women to enter and remain in construction industries across the developed world is painfully clear. Before the pandemic, McKinsey estimated that women make up just 12% of the global construction industry – and only around 8% in the EU.

Even in Sweden, a country which boasts one of the first feminist governments in the world, men comprise 89.8% of the construction industry while women only account for 10.2%.

And, for site-focused roles, they tend to comprise a considerably smaller percentage of workers.

Construction was one of the only industries where the number of jobs held by women increased during the pandemic. Lucy Barnard finds out why and what employers can do to recruit more women during the “she-cession”

The pandemic has brought an increasing number of women to the construction industry

PHOTO:
ADOBE
IMAGES



WOMEN IN CONSTRUCTION

opportunity for the Swedish construction industry to move forward with women's issues," says Elin Kebert, competence expert at the Swedish Construction Federation.

"The construction industry in Sweden has had a very macho culture – if you feel ill, take an aspirin and go to work. Man up. But with the start of the pandemic, I think it was very important for many workers to hear our [then-prime minister], a man with a strong trade union background, saying the opposite. If you're sick, stay home. If your kids are sick, stay home. The Swedish covid strategy does affect attitudes and is helping to make the industry a better and more flexible place to work for women – and men."

Kebert says that since the start of the pandemic the number of applicants to higher vocational education programmes backed by the Swedish Construction Federation seeking to fast-track older professionals into site manager positions have increased rapidly. In 2021, 32% of the 5,494 students that started a "Higher VET" programme within construction and engineering were women.

CONSTRUCTION LABOUR SHORTAGES IN SWEDEN

"The post-pandemic boom has definitely created a labour shortage in Swedish construction," she says. "There are building and construction projects going on throughout Sweden so employers are competing to hire skilled construction workers. Employees are able to choose where to work –

Elin Kebert of the Swedish Construction Federation



both men and women are saying, why should I travel long distances to big building sites when I can work close to home, be an active parent and not miss my kid's dance class. Young professionals want a better work/life balance."

Women are mostly attracted by the career opportunities and good wages," Kebert says. "Building sites are usually operating at the times that day care centres are open. And the work gives them a chance to develop highly desirable and transferable skills."

Susan Moir, research director for the US-based Policy Group on Tradeswomen's Issues (PGTI), points out that the low proportion of women working on construction sites is only a problem in rich countries where construction workers stand to make good money compared with other non-skilled and semi-skilled jobs.

RAISING THE NUMBER OF MINORITIES AND WOMEN IN CONSTRUCTION

She says that in these particular areas, organisations like hers, have been pursuing a strategy of encouraging government agencies and contractors to include agreements

in their construction contracts requiring that a proportion of the total amount of work is done by women and minorities. This is then monitored, usually on a monthly basis. Then, if the monitoring committee finds that women and minorities are not being offered enough work, they can call in the manager in question for a meeting. If no improvement is made after several meetings then the owner

has the right to initiate fines.

Moir says this "integrated supply and demand" model is already such a success that the team is hoping to export the model to yet more cities across the US and beyond. A delegation of North American tradeswomen to London has already been planned next year where Moir and her colleagues plan to exchange best practice with developers, contractors, unions and community groups.

"Organisations like ours have been trying to get more women into the construction trades since the 1970s," Moir says. "We established



Susannah Donaldson of the law firm Pinsent Masons

training courses. We were bringing women to the door of the industry and a few of them even got in and got jobs but we were finding that very few of them made it beyond that. By working with employers who want to be seen to do the right thing, we find we're having much more success. We go for the low-hanging fruit."

GENDER PAY GAP

In recent years, the introduction of mandatory gender pay gap reporting in countries including Sweden, Australia, France and the UK, has shown a stark difference in the salaries paid to men and women across the industry.

Numbers published by large construction businesses continually show that the average woman in the construction industry is paid up to a third less than her male colleagues.

UK law firm Pinsent Masons, analysed the gender pay gap reports published by 118 construction employers in the UK during the year 2020-21. It calculates that on average, contractors paid the men they employed around 20% more than the women. Men also received an average of 20% more in bonus payments during the year compared with their female colleagues.

"As a historically male-dominated sector, construction has traditionally reported one of the largest gaps in the average earnings of male and female employees. While many companies have strategies to measure and address diversity in place, there is still not equal representation, as shown by the data," says Susannah Donaldson, legal director at Pinsent Masons. "It is particularly apparent that fewer women occupy senior or more highly paid roles within the sector, and it tends to be that the majority of new recruits are predominantly male."

"The pandemic has shown employers that have been slow to embrace flexible and remote working practices the extent to which such arrangements can work for their business, as well as for their people." **CE**

PGTI's Kelly McClellen is lobbying to get more women and minorities in construction



New opportunities are opening up for women in so-called 'green construction' roles

PHOTO COURTESY MARTIN BARRAUD/CAIA IMAGE



SOURCE: COMPANY GENDER PAY GAP REPORT

COMPANY	GENDER PAY GAP 2020-21
ACS, Spain	26.7% (female senior management and university graduates earned an average salary of just €56,726 while their male counterparts earned on average €77,384)
Hotchief, Germany	11.5% for executives, 11.2% for managers, and 15.9% for those at a non-manager level
Mace, UK	31.2% mean gender pay gap; 36.4% median pay gap. The Group's mean bonus gap stood at 52.9%.
Keltbray, UK	24.1% "official" mean gender pay gap - normalised to 25.73% when including those on furlough and making salary sacrifices

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THE TRUTH ABOUT BIM

Digital technology has played a role in construction for many years, with – if the truth be told – little demonstrable advance in the industry's levels of productivity.

A central element of this technology is BIM (building information modelling), which has been championed by many industry specialists as a 'game changer', due to its ability to help detect problems in the virtual world, before they become potentially expensive, dangerous and time-consuming in the real world.

The question is, has BIM lived up to its early promise, or does digital technology such as this have a long way to go before it can genuinely make a difference to an industry that is crying out for change?

Construction Europe recently caught up with Fabio Ponzio, VP of building solutions at Hexagon Geosystems to get his views on one of the most talked about technologies in construction for the past 20 years.

Could you explain how BIM can improve productivity and efficiency through the entire lifecycle of a construction project?

Starting with the design and planning phase, BIM enables us to move more from a sequential process to a collaborative process between architects, engineers and other stakeholders.

BIM is more a holistic approach to handling

Construction Europe talks to Fabio Ponzio of Hexagon Geosystems about why using building information modelling really can be good for business

information and defining geometry, material and more in a single model.

Design iterations and changes can be done quickly looking at a variety of factors like material cost, usability, energy, efficiency of construction, etc.

For construction planning, preparation and execution, the high level of details and information available from BIM makes construction more productive, efficient and helps to stay on budget and on time.

BIM is also improving operations as all the information related to building can be handed over to the owner. So, the owner knows exactly what has been installed and what material, pipes, etc, have been used and have easy access to manufacturing information as well.

At Hexagon, we have various solutions supporting the whole lifecycle of BIM.

Whether it's capturing an empty site or an as-built environment of an existing building, BIM can and should be used throughout the entire lifecycle from design, construction to operations. It enables teams to become more

efficient and sustainable from the project's start to finish.

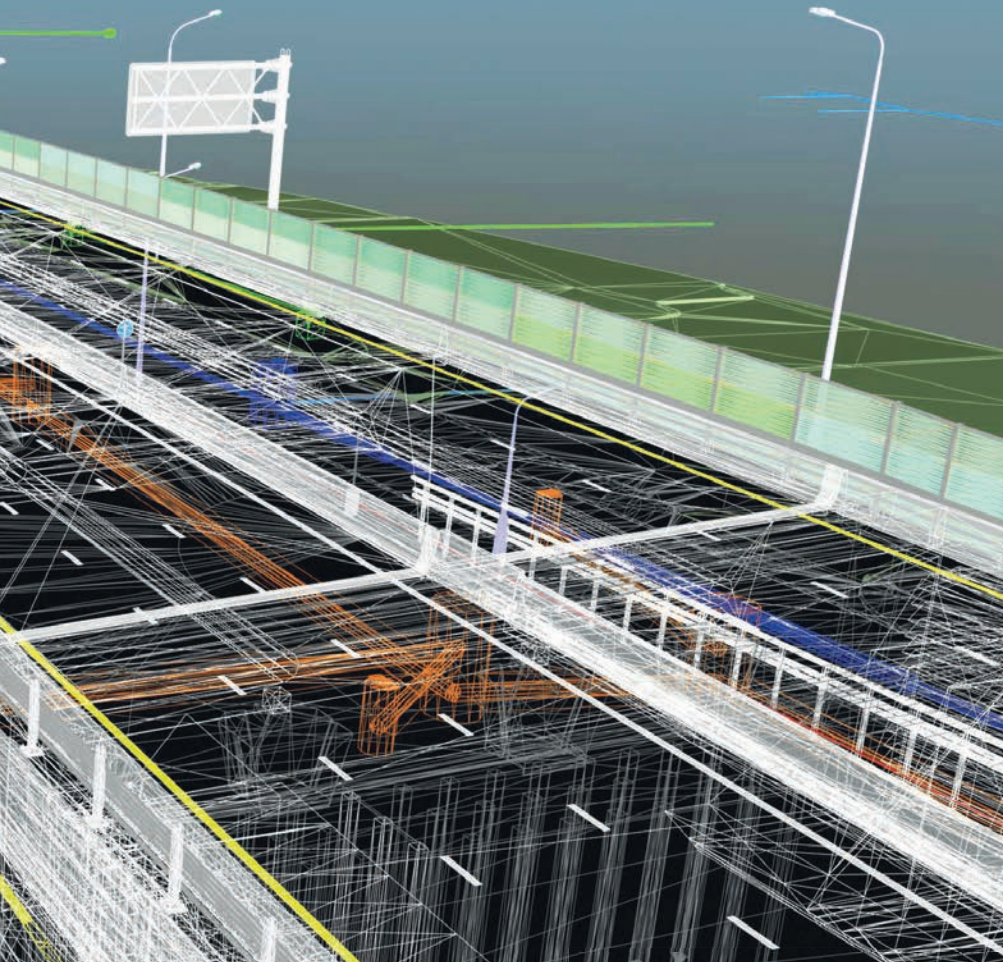
For example, Scan-to-BIM, the process of digitally capturing an existing building or construction site with 3D laser scanning technology, can be used to create a BIM model of an existing building.

Scan-to-BIM contributes to time and cost savings by increasing the speed of accurate data collection. It also positively affects workers' safety by allowing them to remain at a distance while digitally capturing complex areas and environments.

Deploying 3D laser scanning solutions and software also leads to less rework, as inaccuracies are avoided at the initial planning stage instead of being incorporated into the project itself – which will cause problems later on.

Having a visual model or digital twin also means that everyone involved in the project can understand and explore the site without making visits – resulting in a decrease in machine use and harmful CO₂ emissions and also in the number of face-to-face

A BIM model view of transport infrastructure



PICTURE: ADOBE STOCK

The iCON build portfolio seamlessly embeds into BIM workflows allowing customers to participate in projects mandated to use BIM processes, leading to increased opportunities for more business and more efficient BIM-to-Field workflows.

Do you think BIM is currently seen as a contract-winning tool for large contractors, or is it now better understood and being used to greater purpose within both the tier one and SME community?

BIM adoption varies regionally. Some countries are further ahead as BIM, where has been mandated by the government. Still, many architects, engineers and contractors are using more traditional CAD methodology as well.

Many companies are using CAD and BIM depending on the project. We see smaller and bigger companies adopting BIM and investing in tools like reality capture for Scan-to-BIM workflows.

For example, in Spain, Sertogal SL used the Leica Geosystems' reality capture solutions to create a BIM model that guided the remodelling and expansion of the electrical substation of Mera in the province of Ourense – part of an ambitious initiative to partly absorb the energy production generated by 17 new wind farms planned in the region.

In the Netherlands, engineering firm BIM4ALL, a member of the Brevo Group, was commissioned to document sewer pits across the whole country – around 10% of 80 million of these were in need of

replacement due to corrosion from hydrogen sulfide gas.

To achieve this, BIM4ALL deployed the Leica RTC360 3D laser scanner to document 5m-deep pits – capturing 2 million points per second; each pit only took 15 to 30 minutes to complete. Based on this scanning data, BIM4ALL can create accurate BIM models of existing conditions as well.



interactions as we continue to emerge from the pandemic.

The collaborative BIM process also allows everyone on the team to work from the same detailed and accurate information source, making problems easier to identify and faster to resolve.

As the construction industry continues on the path of recovery and emerges from the global pandemic, digital solutions that connect sites and teams easily and quickly will be key, including adopting BIM throughout the construction process.

From design software to connected tools and visualisation within a BIM model, a dynamic flow of data between field and office will allow the digital world to better represent and interact with our physical reality.

Using the right digital solutions to transfer the design data from the office to the field accurately and in real-time reduces rework,

waste and delays on construction sites.

Office-to-Field integration with software and sensor solutions reduces the efforts for point layout creation in the office. It boosts productivity and quality in the field with a constant feedback loop.

For example, the construction-centric BIM-to-Field workflows supported by Leica's iCON solutions ensure connectivity with all leading CAD and BIM software and all industry-standard file format.



PICTURE: HEXAGON GEOSYSTEMS

ABOUT HEXAGON GEOSYSTEMS

FABIO PONZIO is vice president of Building Solutions at Hexagon's Geosystems division, a provider of information technologies that capture, measure and virtualise construction project data. The company's reality-capture technologies - digitising anything from the walls of a house to an entire city - provide construction professionals with actionable information for planning and project execution. For more information, visit www.hexagon.com

The offshore wind sector is growing at an unprecedented rate.

In the UK, for example, the government's Ten Point Plan has set a target of quadrupling offshore wind capacity to produce 40 GW of energy by 2030 – enough to power every home in the country.

However, as turbines get bigger and installations move to deeper waters, the level of technical complexity involved in such installations is increasing.

Built off the north Kent coast in 2009-2012, the London Array is recognised as one of the world's leading offshore wind farms. Comprising 175 wind turbines, the design and construction of the array has attracted global attention and learnings from the project are being applied on a series of larger offshore wind projects around the UK's coastline.

The largest operational offshore wind farm in the world is currently Hornsea One, with a capacity of 1.2 GW, which lies about 75 miles off the Yorkshire coast in the North Sea. With

a capacity of 1.3 GW, Hornsea Two, which is currently under construction, will overtake Hornsea One as the world's biggest offshore wind farm when it becomes operational this year.

In fact, the UK and Europe combined have more wind farms than any other region of the world and have been producing in excess of 30,000 MW of wind energy since 2020. The UK alone generates more wind energy than any other country in the world, with China in second position. The Netherlands is the second-largest market for new capacity (following China), having installed almost 1.5 GW of offshore wind capacity in 2020.

RISK IS UNAVOIDABLE

Increased technical complexity brings greater project uncertainty and therefore risk, but it can

also bring significant opportunities. In the UK's fast-developing wind farm industry, for example, turbine manufacturers and firms involved in their offshore installation are innovating high-performance products and solutions, which they hope to market globally in the future. Getting innovative products to market quickly carries more risk of course, but the potential commercial rewards could be significant.

As well as being exposed to all the usual risks associated with large construction projects, offshore wind farm installations bring some specific challenges for project managers. For example, unpredictable weather events and rough sea conditions can disrupt the programme of works, leading to costly delays.

This can become a particular issue if 'weather windows' for transiting materials or labour to the site of the installation are missed. With demand for wind power increasing as governments around the world

ABOUT THE AUTHOR

PICTURE: EQUIB



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the construction industry.
Visit: www.equib.co.uk

Mark Matthew
on why delays
in offshore
wind projects
must not be
allowed to
hinder green
progress

OPPORTUNITIES IN THE

focus on reducing carbon emissions, liftboats or jack-up vessels could soon be in short supply, adding to the risk of losing a slot. The ability to manage and forecast potential delays is critical to provide confidence for such activities.

COVERING THE BASES

Many other risk factors could impact the installation of offshore wind farms. For example, unexpected seabed conditions, which could include hazards not picked up by geological surveys, can sometimes cause lengthy delays if objects have to be removed. Indeed, seabed conditions may be variable across the site and it is important to know this at an early stage as it could influence the design of foundations and structures.

Design and/or quality defects can also cause delays if, for example, new turbine technologies are flawed or fail to perform according to their specification. The multi-package approach, which is often adopted when procuring large-scale infrastructure projects where multiple teams of specialist contractors are required, can also increase the risk of cost and schedule overruns.

In any industry where the scope of projects is getting bigger and more complex, and contractors lack experience, risk management is bound to be more challenging. For this reason, it is vital that project managers ensure that robust processes, systems and controls are employed from start to finish.

ENABLE DECISION MAKING

Project managers should also look beyond the risk register and ensure they

have good visibility of the project as a whole, so they can take the right decisions in critical situations. Too much reliance on a 'bottom-up' approach to project delivery could allow critical gaps to go unnoticed, allowing issues to build up and come to the fore at a later stage in the programme.

Good governance and agile decision making can help to limit cost and time overruns by enabling project managers to take action as and when issues arise.

As governments around the world commit to reducing greenhouse gas emissions in the wake of COP26, global demand for offshore wind farms is forecast to grow.

For the UK and European countries that have invested in wind power, there is an opportunity to capitalise on this developing economic opportunity, and skilled contractors as well as project managers have a critical role to play in accelerating the way to the wind-powered future.



Europe currently leads the world in its development of offshore wind farms
 PICTURE: ADOBE STOCK

WIND

New model in Hitachi wheeled loader range

Hitachi Construction Machinery has announced the launch of a larger next-generation model from its Stage V-compliant wheeled loader range.

The ZW310-7 has been designed to provide more control in tough working conditions, according to the manufacturer.

The model also has enhanced safety features, as well as increased efficiency and promises a low total cost of ownership.

To protect the operator and machine from potential hazards, it allows a superior

view from all angles – with increased visibility to the rear and either side of the narrow engine hood.

With the Aerial Angle camera system, operators also have a 270-degree bird's-eye view of the job site, while the rear obstacle detection and warning system alerts them immediately if anything is close to the rear of the machine.

Hitachi says high levels of productivity are ensured by fast cycle times, a high breakout force and loading capacity, and improved acceleration on inclines, thanks to sensors

New Stage V-compliant machine comes with enhanced safety and efficiency features

Hitachi's new stage V-compliant ZW310-7

PHOTO: HITACHI CONSTRUCTION MACHINERY

installed on several machine components.

New features from Hitachi The RPM are automatically increased due to the auto power up function, which maintains the machine's travel speed when moving uphill. As a result, the reduced cycle times can enhance productivity and reduce fuel consumption.

The payload monitoring system

on the new ZW-7 promises time and money savings through more accurate loading.

In addition, operators can monitor fuel consumption with the new ECO gauge and performance can be improved with several adjustable functions.

"The new ZW310-7 wheel loader has been designed to give a powerful performance, low total cost of ownership

COMPACT EQUIPMENT

Wacker Neuson's electric equipment tested

Construction company Leonhard Weiss has put Wacker Neuson's entire range of zero-emission machinery to use on a construction site in Germany, in what has been described as "practical test".

The company, which has subsidiaries in nine other European countries, operates in a number of industry sectors including roadbuilding, railway construction, engineering and turnkey construction, and carries

out restoration and preservation projects.

A long-standing partner of Wacker Neuson, Leonhard Weiss used the manufacturer's electric and battery-powered equipment to carry out the renovation of the main market square in Stuttgart, in south-west Germany.

This included the DT10e track dumper, the DW15e wheel dumper, and the WL20e wheel loader, which were primarily used to transport material onsite.

Alongside these, Leonhard Weiss also used the EZ17e Zero Tail excavator to carry out excavation and demolition tasks, and Wacker Neuson's battery-powered rammers and its new APS series battery-powered plates for soil compaction.

Simon Schall, Head of Central

Machine Technology at Leonhard Weiss, said, "We really like the fact that the electric machines and construction equipment have the same power as conventional ones.

"During daily operation, there are fewer maintenance points than with combustion-engine equipment, and drivers or operators can get to grips with the machine much more easily."

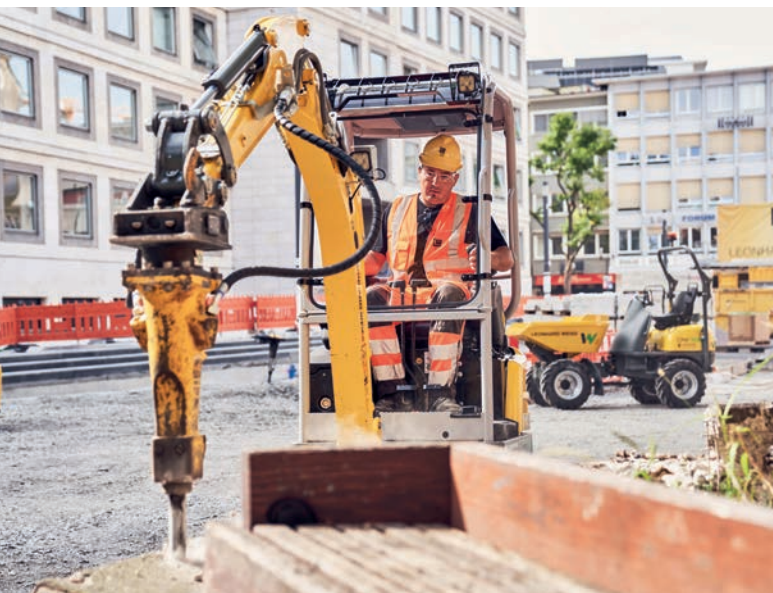
According to Wacker Neuson, its zero-emissions range can help contractors meet the increasing stringent exhaust and noise emissions regulations.

The DW15e wheel dumper on site in Stuttgart, Germany. Photo: Wacker Neuson.

"The electrically powered construction machines are also up to 20 decibels quieter than their gasoline-powered counterparts," the company said.

"This is an extreme reduction, as just ten decibels less means a 50% reduction in perceived loudness."

ce



The EZ17e zero tail swing excavator on the urban project in Stuttgart, Germany

PHOTO: WACKER NEUSON

FOUNDATIONS

Bauer drilling rig proves quiet and efficient

New eBG 33 passes in-the-field test says foundation drilling specialist

Bauer Maschinen has completed the testing on its first fully electric foundation drilling rig, the eBG 33.

The company said the prototype machine completed piling operations on a test site in Münster, Germany, drilling piles of 1200mm to a depth of 16m.

Bauer reported noise reduction of up to 50%, compared with its diesel-powered counterpart, as well as fuel savings equivalent to 400 litres of diesel, after eight hours of operation.

Operating in the range of 280 to 390kNm of torque, the rig is capable of tackling a range of applications, including Kelly drilling, cutter soil mixing processes, double-head drilling and even diaphragm wall milling.

The rig is powered via a direct power supply, as opposed to battery power. Bauer says an available battery system could not provide the required power for a rig in this size class.

The first electric rig has been presented with a drag cable, which, according to Bauer, makes it particularly suitable for soil mixing processes during which the rig will remain relatively static.

AN EVOLUTIONARY PROCESS

Heinecker said, "Overall, cable routing will still bring some challenges, because there are different requirements in every project, and the possible solutions will be correspondingly diverse."

The current solution is a so-called power loop – a thick hose with a solid protective jacket inside of which a total of seven cables run.

According to Heinecker, the customer reduces general operating costs through the

Bauer's eBG 33 electric foundation drilling rig



PHOTO: BAUER MASCHINEN

"highly efficient electric drive."

He explained that the entire carbon footprint of a building is positively influenced – by the CO₂-optimised electric drive, but also through the possible choice of CO₂-optimised construction processes.

The electric rig is set to be deployed this year, on a jobsite on the UK's HS2 high-speed rail network.

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and exceptional efficiency to European customers," said Bill Drougkas, manager product management of Hitachi Construction Machinery (Europe) NV.

"Built to the highest quality standards, it will significantly boost productivity on busy quarries and large recycling plants, and have a positive impact on profits."

ce

CONNECTED POWER

Christian Heinecker, head of the drilling rigs business unit at Bauer, said, "Our analyses have shown that...operating costs can be massively reduced with a longer use of the eBG, compared to a diesel-powered drilling rig."

ATTACHMENTS

New Cat hammers for large excavators

demolition, quarry, and general construction applications.

They are built for high production tasks and are said to deliver consistent breaking power and emit less waste from internal heat for more power delivered to the tool.

"With piston and tool matched...hammers offer increased power transmission frequency," said Cat.

"Operators can switch power mode from high frequency/low power to low frequency/high power, giving the ability to fine tune power to the material being broken."

Now available in Europe, the H190 S and H215 S offer 370

to 530 and 300 to 520 hammer blows per minute respectively.

The breakers include a buffering material that dampens vibration feedback to the carrier and they can be configured for joystick or pedal control to suit the operators preference.

They are also equipped with an automatic shut-off that prevents blank firing and hammer damage. According to the manufacturer, the feature can be turned off to allow for horizontal and overhead operation on tunnelling and mining applications.

Specifically designed for use with Cat's next gen excavators, the H190 S hammer is sized for

mounting on Cat machines with operating weights of between 43 and 80 t, which includes the Cat 349 through to the 374 excavator models.

Meanwhile the larger H215 S is designed for use with the 374 and 395 machines, weighing between 65 and 120 t.

"Next gen excavators... recognise the H190 S and H215 S Hammers and prompt operators to select the correct tool programme," said Cat.

"Protecting the cab and keeping the attachment in predefined operating areas at the jobsite, the new hammer dimensions are included in Cat E-Fence technology."

Cat's H215 s hammer



PHOTO: CATERPILLAR MACHINERY

Caterpillar has introduced two new hydraulic breakers as part of its Performance Series Hammers range.

The new Cat H190 S and the H215 S models are the largest in the attachment range, which comprises seven other models, and have been designed for use on large excavators for

New stage V excavators from Hyundai

New 13-15 tonne HX130A LCR, HX140A L and HX145A LCR crawlers join HX A-Series

Hyundai Construction Equipment has launched three new EU Stage V compliant HX A-Series crawler excavators in the 13-15 tonne weight class.

Said to deliver “new levels of performance, efficiency and productivity for rental companies and contractors” alike, the manufacturer’s new HX130A LCR, HX140A L and HX145A LCR excavator models are all powered by the latest diesel engines from Cummins.

According to the manufacturer, when used with a CK-4 E/G engine oil, the new engines offer users a 1,000-hour service interval. Double the service interval offered by the company’s previous models, this “reduces operating cost for the customer, boosting uptime on site,” said Hyundai.

SMART TECHNOLOGIES

All three machines include Hyundai’s Eco Report function,

which helps operators improve efficiency and reduce fuel consumption, and a new Lifting Mode that allows for greater fine hydraulic control.

Other technology features in the HX A-Series excavators include the company’s standard Hi MATE remote management system for service connectivity and remote diagnostics, and the newly update Mobile Fleet App, which gives fleet owners access to machine operating data - such as economical usage, utilisation and fault code recognition.

The A-Series models have also been equipped with the manufacturer’s upgraded Intelligent Power Control (IPC).

According to Hyundai, this feature optimises hydraulic pump flow rate and power to match the machine’s working conditions.

While incorporating many of the same technologies and offering similar operating weights, Hyundai said “the



PHOTO: HYUNDAI

Hyundai’s HX140A L crawler excavator

HX130A LCR, HX140A L and HX145A LCR deliver very different performance operating envelopes, to suit a range of customer requirements”.

Offering specific advantages for customers from the equipment rental sector, the HX130A L offers reduced swing and includes Hyundai’s ECD engine connected diagnostics system.

Similarly the conventional counterweight HX140A L excavator features a more powerful 100kW (134hp) version of the Cummins engine, as well as offering 3% more power and 12% more torque than the company’s previous HX-Series model.

The reduced tailswing of

HX145A LCR model makes it suitable for applications where space to manoeuvre is at a premium, such as utilities, road working and housebuilding.

IMPROVEMENTS TO EXCAVATOR CABS

The operator cabs of all three machine’s benefit from a 13% increase in space, and feature an improved grab handle design in the cabin door.

According to Hyundai, this makes it easier for drivers to access the seat and improves visibility to the side of the machine from the cab, which also include an 8-inch touchscreen that provides access to machine information.

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ATTACHMENTS

Doosan partners with Tobroco-Giant on loaders

Five new compact wheeled loader models will be built by Tobroco-Giant and sold under the Doosan name through its European dealer network,

following the signing of an exclusive supply agreement between the two OEMs.

Doosan Infracore Europe said it will introduce the first

Tobroco-Giant manufactured models in the 3.5 to 5 tonne weight range this year.

Netherlands-based Tobroco-Giant manufactures loaders, skid steers and compact telehandlers for materials handling, construction, rental, agriculture and landscaping.

Chris Jeong, CEO at Doosan Infracore Europe, said: “Doosan Infracore is constantly looking at improving and extending the product offering from the company, to ensure our customers have the most innovative and competitive solutions for their needs.

“With Tobroco-Giant, we have a partner with long-standing

experience and a high-performing range of compact wheel loaders.”

Tobroco-Giant CEO Toine Brock described the partnership as “the next milestone” in the growth of the company; “Doosan is well known for their innovative products and customer service, which is a great fit for Tobroco-Giant.


“We are looking forward to working with Doosan Infracore Europe to grow the market for compact wheel loaders.”

More details on the new compact wheeled loaders will be released in Spring, when the full range will be formally launched.

Doosan’s Tobroco-Giant manufactured DL60 and DL80 compact wheel loaders



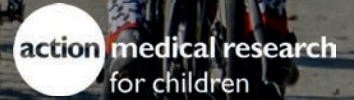
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The Big Buyers initiative

WHAT IS THE BIG BUYERS INITIATIVE?

The Big Buyers for Climate and Environment is a platform funded by the European Commission, (DG Grow) and run by the local Governments for Sustainability (ICLEI Europe) and Eurocities, the network of major European cities. The general objective of the initiative is to bring together local and regional governments, central purchasing bodies, and other public agencies to maximise public market power and orientate the demand for targeted innovative and sustainable products and services.

The Big Buyers platform is organised in different working groups carrying out ad-hoc activities on topics such as on electric vehicles, circular construction and zero-emission

construction sites. In addition to sharing market intelligence and joint market engagement, the working groups exchange on best practices, define procurement criteria and strategies and keep updates on technical developments. The platform also provides a communication channel for participants, including webinars and online exchanges of information.

WORKING GROUP ON ZERO-EMISSION CONSTRUCTION SITES

One of the working groups of the Big Buyers initiative works on zero-emission construction sites (Zemcons). The Working Group exchanges on zero-emission pilot projects with the goal of making them standard practice in the future by mainstreaming zero-emission construction. The main approach towards the market is to signal the long-term tendency of public buyers to aggregate demand and accelerate the transition to zero-emission construction sites. The members of this group expect that by aggregating demand and informing the market, serial production of emission-free solutions can be accelerated, enabling infrastructure can be put in place, and overall prices can decrease. The working group aims to push for technical developments of zero-emissions construction machinery, most of all targeting the supply of large earth-moving machinery, which they see as the missing link to emission-free jobsites. The members of Zemcons aim at jointly developing and implementing procurement approaches (procedure, minimum requirements, award criteria) for low- and zero-emission public construction sites.

Around 20 public administrations are part of Zemcons, which represents a combined procurement value

The European construction industry association, CECE, reports on public procurers joining forces to create zero-emission construction sites

of €14 billion annually. Even if Scandinavian cities have an undisputed leadership role in the group and front-runner targets, the Big Buyers initiative also includes cities like Madrid, Barcelona, Berlin, Brussels and Amsterdam. It is evident that the participating cities are in different stages of the transition to clean construction works and are based in extremely different countries with regards to their energy mix.

CECE AT OSLO MARKET DIALOGUE

Since its kick-off in April 2021, the working group held several meetings, starting by the definition of common needs and the prioritization of the work, followed by an exchange on pilot examples for the city of Helsinki and Copenhagen. In September 2021 a first joint market dialogue took place with the participation of a few single machinery manufacturers.

On 1 December 2021, a second market dialogue event was held in Oslo. Opening the event, the Vice-Mayor spoke of the city's commitment, by spelling out the current procurement strategy bringing the city to tendering only emission-free jobsites by 2025, after having its first fossil-free jobsite in 2016 and the first emission-free construction works in 2019. The market dialogue gathered 40 participants along the value-chain, such

as contractors, machinery manufacturers, dealers, technology providers and a wide range of public procurers sharing their decarbonisation story.

CECE took part in this event and provided the overall industry's perspective on the decarbonisation journey of construction equipment. CECE calls on all stakeholders to focus on enabling actions at local, national and international levels. The diversity of conditions and energy mix in European countries reinforces the need for market-driven approaches that can take that diversity into consideration.

From a technology point of view, CECE reminded that net-zero carbon solutions exist, but they need to be made scalable with technology-enabling factors, such as availability of hydrogen and electricity charging infrastructure, predictable pricing structures of alternative energy sources and the availability of biofuels to decarbonise existing machinery fleets.

CECE also recalled that there is a radical difference between decarbonising construction machinery and on-road vehicles. To understand the potential of decarbonisation and low emissions offered by modern machinery, we must move from a solely machine-focussed approach to a more holistic view and consider four interdependent pillars: machine efficiency, process efficiency, operation efficiency and alternative energy sources.

WHAT IS NEXT?

Procurers acknowledge that practices must change more widely than the group of frontrunners within the Big Buyers initiative, starting from a more widespread use of the better-value-for-money criteria to award tenders.

From a CECE perspective, dialogue is key for future joint actions; manufacturers recognise the positive contribution of organised exchanges, as this type of market-driven initiatives give strong signals to manufacturers and greater willingness to keep innovating for sustainability. **CE**

“The working group aims to push for technical developments of zero-emissions construction machinery.”



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Recasting the EU's buildings policy

NO EMISSIONS FROM BUILDINGS IN 2050

The central piece of legislation for decarbonising the EU's building stock is out. Before the Christmas break, the European Commission published its proposal for the recast of the Energy Performance of Buildings Directive (EPBD) in order to promote the improvement of the energy performance of buildings and reduce CO₂ emissions with a view of achieving a zero-emission building stock by 2050.

NEW DEFINITION: ZERO-EMISSION BUILDING

The ambition is clear: In 2050, we are all going to live in zero-emission buildings. A 'zero-emission building' is not a zero-energy building. Its use will still require energy but only very low amounts. The permitted energy consumption will vary from country to country according to their respective 'climate zone'. A building in Finland can consume more than a building in Spain. Important to note: The energy still required will be fully decarbonised, ie, it will have to come from renewable sources on-site (like solar panels), renewable energy communities or district heating or cooling.



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Industry association FIEC on the European Commission's tabled proposal for decarbonising the EU bloc's building stock

NEW DEFINITION: DEEP RENOVATION

How do we get there? A small share of these zero-emission buildings will be the result of new constructions in the coming years. However, 85-95% of the buildings that exist today will still be standing in 2050. The shift to zero-emissions has to be achieved through a wave of 'deep renovations' across the EU. 'Deep renovation' is now defined as a renovation which transforms a building into a zero-emission building. This can be a one-shot operation or a so-called staged deep renovation which is being carried out in several steps.

RENOVATE YOUR HOUSE!

While the European Commission is giving some flexibility to Member States on how to achieve the goal of a zero-emission building stock by 2050, it considers it necessary to set specific timelines for the renovation of the worst-performing buildings and suggests the introduction of minimum energy performance standards for existing buildings according to which...

- all public and non-residential buildings achieve at least energy performance class E after 2030
- all residential buildings achieve energy performance class E after 2033

COMPLEMENTARY MEASURES

It is important to note that the EPBD is not a standalone instrument to decarbonise the building stock. While the European Commission attaches great importance to its revision, the 'Fit for 55' package contains additional measures for bringing emissions down to zero by 2050. Notably the extension of the EU's Emission Trading Scheme (ETS) as well as the revision of the Energy Efficiency Directive (EED) and the Renewable Energy Directive (RED) are supposed to support energy efficiency in buildings and move away from fossil fuels for heating and cooling. Interestingly, the Regulatory Scrutiny Board (RSB) – a body checking the quality of impact assessments within the European Commission – did not give its green light because the Commission did not manage to clearly show how the EPBD proposal can effectively constitute a complementary added value regarding the rest of the 'Fit for 55' package.

CONCERNS ON THE FINANCING AND THE TIME SCHEDULE

No doubt, such an obligation calls for a consequent considerable financial and technical support. Furthermore, in several Member States the largest share of the existing buildings is in the worst energy performance classes and the respect of the proposed time schedule is generating some serious concerns. But this regulatory push is indispensable, given the lack of progress in the last years and associated benefits. Renovating such buildings promises the biggest energy efficiency gains and greenhouse gas reductions. And not to forget: Societal and economic benefits such as improved living comfort and the creation of jobs.

WHAT ABOUT WHOLE-LIFE CARBON EMISSIONS?

Since the reduction of operational energy consumption is considered the most effective driver for reducing CO₂ emissions from buildings, the proposal rightly focuses on improving the energy performance of the building stock. At the same time, first steps are taken to introduce a whole-life carbon approach into EU buildings policy. As of 2030, the Global Warming Potential (GWP) has to be calculated for

new buildings. In other words: When constructing a new building, it will be mandatory to quantify the building's emission over its lifecycle – from raw materials extraction over its use stage to the demolition. This aims at generating data to potentially set CO₂ thresholds per m² as it has been introduced in a few Member States like Denmark or France.

2030 IS CLOSE

It will still take years until the different measures come into operation and show first results. We are only at the beginning of the legislative process which will take at least one year or even longer due to social repercussions associated with the revamp of buildings policy. Once adopted, the legislative texts will have to be transposed into national law which will take another few years. It was only this year that the previous version of the EPBD of 2018 has been fully transposed into the different national legislations. About only half a decade will then be left to achieve the 2030 target of reducing the EU's emissions by 55%. It is therefore essential that we now pave the way for carbon neutrality in 2050 and ensure a predictable and effective buildings policy framework.

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Weighing the cost of Covid

The European Rental Association reflects on a difficult 2020 for European rental markets amid the pandemic, but a return to growth in 2021

The European Rental Association (ERA) has released its 2021 Market Report. Developed with the support of the ERA Statistics Committee, the ERA Market Report has been the reference source of intelligence for the European equipment rental market since 2008.

This edition, comprising market trends and international comparisons, uses a common methodology and definition to analyse 15 European markets, plus the Baltic states, with detailed market size results for 2018-19 (actual), 2020-21 (estimates) and 2022-23 (forecasts). These countries account for more than 95% of the equipment rental industry in the EU, the European Free Trade Association (EFTA) and the United Kingdom.

In 2020, equipment rental companies and other companies

providing rental services generated a total rental turnover of more than EUR 25.2 billion in these countries.

At a constant exchange rate, the equipment rental industry in the 15 countries analysed and the Baltic region declined by 7.2% in 2020. In 2021, there is an estimated growth of 6.3%, with 2022 forecast to increase by 5.6%, also at a constant exchange rate.

NO WINNERS WITH COVID

The overarching theme from the 2021 report is that 2020 was a difficult year for all the markets covered, even for those that managed to remain positive amidst the pandemic. Consequently, some markets fell considerably (France, Italy, Spain, UK), while others also lost ground but fared better overall (Switzerland, Sweden, Germany). This trend continued into the first quarter of 2021 before seeing returns closer to pre-pandemic levels of activity later in the year.

The Covid-19 pandemic took Europe by surprise in 2020 and continues to plague the recovery in some markets, both directly and indirectly. The immediate impact differed from country to country. The Nordic countries, which did not lock down and with almost no site shutdowns, performed better than southern Europe and the UK, which faced severe lockdowns and



disruptions to activity. With Brexit having now taken effect, the UK finds itself in a difficult position as the sourcing of materials now incurs increased costs, and the labour shortage, present across Europe, is further exacerbated.

The reopening of most European economies after the first quarter of 2021 proved beneficial for rental activity as construction was able to pick up and other sectors of the economy also reopened. The performance throughout the rest of the year improved in most markets and now points to a solid growth forecast for 2021, mainly in Southern Europe and the UK, which were the worst-hit regions, while growth in Nordic countries and Eastern Europe remains more constrained.

RECOVERY SET TO CONTINUE

It is important to stress the extreme conditions of 2020 and 2021, which have been analysed with our forecasts. Large peaks are expected this year, and further significant growth is expected in the short term.

The report is being published later than usual due to a delay from Eurostat in delivering its 2019 data. Unfortunately, the data were not available before the end of the year, so ERA

and IHS Markit took the decision to publish the report based on the available data. When receiving the data for the year 2019, and if this is justified, an update of the report will be established and released as soon as possible.

The ERA Market Report is the leading source of market intelligence on the European equipment rental market and the only Europe-wide industry benchmark. It contains detailed market information for the years 2018 to 2023 and key indicators, including rental turnover, fleet value and investments. This report includes a more accurate estimate of the UK rental market, with an improved methodology for evaluating cross-hire, as well as detailed data on the US rental market.

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ABOUT ERA

The European Rental Association was created in 2006 to represent national rental associations and equipment rental companies in Europe. Today, the membership includes over 5,000 rental companies, either directly or through 15 rental associations. ERA is active through its committees in the fields of Promotion, Sustainability, Statistics, Technical and through its Future Group.

■ Extensive information on ERA's activities, reports, and publications is available on the ERA website at www.erarental.org.



Pinsent Masons'
Simon Plunkett
examines
industrialised
construction and
the changing
nature of
construction
disputes

Why off-site is on-message

Political, economic, social and environmental factors are leading the construction sector to embrace industrialised construction. This should enable better management of projects, reducing the number of disputes that commonly impact on successful delivery.

However, new kinds of disputes are likely to emerge from the move towards industrialised construction. Here these disputes arise, they are likely to be on a larger, more strategic scale, possibly spanning multiple projects and geographies.

NEW FORMS OF DISPUTES

Some types of dispute which are currently less familiar to the sector may well become a more regular feature. One example of this could be disputes between contractors and technology providers working in new collaborations. These arrangements may be subject to contractual arrangements that have more in common with commercial contracts and purchasing agreements than with the more traditional construction and engineering forms.

These disputes could arise from supply problems, defects, product recalls, or other product liability issues. We are already starting to see signs of this in parts of the construction

industry where supply chains are limited and products standardised, such as in offshore wind. To manage the risk of these issues becoming business critical, contractors and others in the supply chain will want to explore liability caps and other contractual protections, as well as insurance.

Output-based disputes relating to the operation of the infrastructure asset, as we currently see in PPP/PFI contracts, could also become more prominent with the industrialisation of construction processes – including disputes driven by 'net zero' carbon requirements. This risk should spur on employers and the supply chain to better understand what standards are adopted and how they can be met.

Contracts are also more likely to focus on the output from the whole life of infrastructure assets in future rather than the construction phase alone. This raises questions about how liability is determined across the life of the asset and for risk sharing under the contract.

We also anticipate a rise in disputes over intellectual property rights in a world where data and technology are significant assets and will become increasingly valuable on construction projects. Disputes over the control of data, rights to use data and the management of data – including around security and privacy – are likely to be key areas.

Thought will also need to be

given to variation provisions and whether and how manufactured components can be changed. In an industry where off-site manufacturing will become more prevalent, changing components in one project has the potential to impact a whole production line that produces components for other projects. This is an area where disputes could arise and warrants consideration of whether a bespoke approach to variations is needed in project contracts.

Off-site manufacturing raises a raft of geographical issues. Government-led projects in developing economies often have significant local content and job creation requirements. On-site installation of complex components manufactured off-site may require local labour force upskilling and project contractual documents to allow for that, failing which significant disputes can arise. Off-site manufacturing in countries where labour and materials are cheaper also brings with it foreign exchange risk, which can lead to disputes.

One of the other impacts we anticipate from the industrialisation of construction processes is that tier one contractors may take on 'fitness for purpose' obligations for components that have been standardised. It may not be possible to pass these obligations along the supply chain. Contractors will need to focus on product suitability and be cautious when issuing warranties and agreeing liability caps.

to reduce the frequency of defects disputes associated with on-site installation. In some jurisdictions it can sometimes be a struggle to secure the quality of workmanship required and for main contractors a major pre-occupation is the availability of labour and necessary skill levels. Industrialised production offers an opportunity to develop skills, and thus improve quality, through effective training of a smaller and more dedicated workforce.

Off-site manufacturing undoubtedly provides a safer, more controlled environment, which brings the significant benefit of reducing health and safety incidents. These health and safety benefits are likely to be greatest where extreme on-site climatic conditions can be mitigated by maximising off-site manufacturing and reducing the number of people physically required on site.

Off-site factory assembly of major components allows operations to be conducted in a safer, healthier environment, leading to more efficient, productive use of labour; less wastage and loss of materials and supply items; adherence to higher specifications using quality tools and machinery operated by a trained, healthier and happier workforce.

Improved technology such as live data monitoring should help parties reduce the scope and better understand the cause of their disputes if and when they arise.

Although the increase in standardisation brings many positives, it also has the potential to stifle innovation, so it remains very important for risk to be properly allocated to ensure the industry continues to push the boundaries, not least to deliver on the zero carbon requirements that will increasingly become a major delivery requirement across the global industry. **ce**

ABOUT PINSENT MASONS

Pinsent Masons LLP is a construction law firm with a true infrastructure and energy sector focus. Pinsent Masons LLP is ranked No 1 for construction law by all legal directories in the UK. It is an international law firm with offices across Europe, the Gulf and Asia.

■ Further information on any legal or contractual issue can be obtained from Pinsent Masons by visiting: www.pinsentmasons.com, or calling +44 (0)20 7418 7000

SOME FORMS OF DISPUTE ARE LIKELY TO BECOME LESS COMMON

Whilst new types of construction disputes are likely to emerge from the industrialisation of the industry, others may become less common.

Off-site manufacturing and standardisation should help

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