CONSTRUCTION
europe
THE MAGAZINE FOR EUROPE'S CONSTRUCTION INDUSTRY
www.construction-europe.com
MARCH 2022
A KHL Group publication

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CONSTRUCTION europe
Volume 33 | Number 2 | **MARCH 2022**

khl ISSN 0964–0665

Construction Europe is published 8 times a year.
Annual subscription rates: £215, €260, US$345.
For further information please visit www.khl.com

MEMBER OF

KHL OFFICES

UNITED KINGDOM (HEAD OFFICE)
KHL Group
Southfields, Southview Road,
Wadhurst, East Sussex TN5 6TP, UK.
+44 (0)1892 784088 | ce@khl.com
www.khl.com/ce

USA OFFICE
KHL Group Americas
3726 East Ember Glow Way,
Phoenix, AZ 85050, USA.
+1 480 6590578 | americas@khl.com

SOUTH AMERICA OFFICE
KHL Group Américas
Av. Manquehue Sur 520, of. 205,
Las Condes, Santiago, Chile.
+56 9 7798 7493 | cristian.peters@khl.com

CHINA OFFICE
KHL Group China
Room 769, Poly Plaza,
No.14, South Dong Zhi Men Street,
Dong Cheng District, Beijing, PR China 100027
+86 (0)10 65536676 | cathy.yao@khl.com

GERMAN OFFICE
KHL Group
Niemöllerstrasse 9,
73760 Ostfildern, Germany
+49 711 34 16 74 0 | gabriele.dinsel@khl.com

KHL SALES REPRESENTATIVES

BRAND MANAGER
Simon Kelly, UK Head Office
+44 (0)1892 786223 | simon.kelly@khl.com

AUSTRIA/SWITZERLAND/ EASTERN EUROPE
Simon Battersby, German Head Office
+49 (0)711 34167470 | simon.battersby@khl.com

BENELUX
Ollie Hodges, UK Head Office
+44 (0)1892 786253 | ollie.hodges@khl.com

CHINA
Cathy Yao
+86 (0)10 65536676 | cathy.yao@khl.com

FRANCE
Hamilton Pearman
+33 (0)1 45930858 | hpearman@wanadoo.fr

GERMANY/SPAIN
Petra Kaiser
+49 (0)711 34167472 | petra.kaiser@khl.com

ITALY
Fabio Potestà
+39 010 5704948 | info@mediapointsrl.it

JAPAN
Michihiro Kawahara
+81 (0)3 32123671 | kawahara@rayden.jp

KOREA
Simon Kelly, UK Head Office
+44 (0)1892 786223 | simon.kelly@khl.com

SCANDINAVIA
Bridget Leary, UK Head Office
+44 (0)1892 786220 | bridget.leary@khl.com

TURKEY
Emre Apa
+90 532 3243616 | emre.apa@apayayincilik.com.tr

UK
Eleanor Shefford, UK Head Office
+44 (0)1892 786236 | eleanor.shefford@khl.com

USA/CANADA
Wil Holloway
+1 312 9292563 | wil.holloway@khl.com
Thomas Kavooras
+1 312 9293478 | thomas.kavooras@khl.com

FROM THE EDITOR

NO WINNERS IN A EUROPEAN WAR

Even before the invasion of Ukraine, Europe was steering a path away from a reliance on Russian oil and gas, with the accelerated growth of renewable energy projects.

Now, however, the speed of change must shift into another gear, as the European Commission (EC) sets a target of just five years to eliminate its energy dependency on a nation that has shown it is prepared to become an international pariah to achieve its ends.

Following an emergency summit of EU leaders, EC President Urusla Von der Leyen said, "By mid-May we will come up with a proposal to phase out our dependency on Russian gas, oil and coal by 2027, backed by the necessary national and European resources."

Up to now, Russia has delivered some 40% of the EU's supply of natural gas, plus more than a quarter of its imported crude oil, not to mention almost half of its imported coal.

Cutting off this supply, of course, will be extremely painful for Russia, but potentially no more so than for many European nations.

What has been initially proposed is a reduction of two thirds in Russian imports within the next 12 months – a plan that must be accompanied by a rapid expansion of wind, solar and other renewable energy projects, as well as the increase of gas and oil imports from other producing countries.

European Green Deal commissioner Frans Timmermans said recently that biogas production should also be doubled by 2030, along with a quadrupling of annual hydrogen use to 20 metric tonnes.

However Europe looks to transition away from Russian imports, the construction industry must be ready to play a major role in a plan that, one hopes, will force Russia to rethink its current stance.

Mike Hayes,
Editor
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ON THE COVER

Case's CX210E is one of a range of seven new crawler excavators from the manufacturer, featuring tougher structures, enhanced cab designs and more efficient engines. See it in Earthmoving.

PHOTO: CASE CE

KHL TEAM

EDITOR
Mike Hayes
+44 (0)1892 786234 | mike.hayes@khl.com

DEPUTY EDITOR
Catrin Jones
catrin.jones@khl.com

CONTRIBUTING EDITOR
Leila Steed
leila.steed@khl.com

EDITORIAL TEAM
Lindsey Anderson, Andy Brown, Jenny Lescohier, Cristián Peters, D.Ann Shiffler, Belinda Smart, Euan Youdale
EDITORIAL MANAGER
Alex Dahm
EDITORIAL DIRECTOR
Murray Pollok
LAW & CONTRACT CORRESPONDENT
Produced in co-operation with Pinsent Masons
SOUTH EAST EUROPE CORRESPONDENT
Nikola Čanić
CECE REPORT
Produced in co-operation with the Committee for European Construction Equipment
FIEC REPORT
Produced in co-operation with the European Construction Industry Federation
EVENTS & CREATIVE DIRECTOR
Saara Rootes
PRINT PRODUCTION MANAGER – KHL GLOBAL
Anita Bhakta
+44 (0)1892 786246 | anita.bhakta@khl.com
DIGITAL & PRINT PRODUCTION MANAGER – KHL GLOBAL
Charlotte Kemp
+44 (0)1892 786262 | charlotte.kemp@khl.com
GROUP DESIGN MANAGER **Jeff Gilbert**
GROUP DESIGNER **Jade Hudson**
EVENTS DESIGN MANAGER **Gary Brinklow**

DIGITAL MEDIA DIRECTOR
Peter Watkinson BA (Hons)
HEAD OF DATA AND AUDIENCE DEVELOPMENT
James Taylor
james.taylor@khl.com
AUDIENCE DEVELOPMENT DEPUTY MANAGER
Anna Philo
anna.philo@khl.com

FINANCE MANAGER
Alison Filtness
FINANCE ASSISTANTS
Carole Couzens
+44 (0)1892 786250 | carole.couzens@khl.com
Clare Grant, Jo Keen, Kate Trevillion
OFFICE MANAGER
Philippa Smith
+44 (0)1892 786201 | philippa.smith@khl.com
SUPPORT SERVICES **Julie Wolstencroft**

CHIEF FINANCIAL OFFICER **Paul Baker**
CHIEF OPERATING OFFICER **Trevor Pease**
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GIC-Concrete Days
April 28-30, 2022
Piacenza
Italy
www.gic-expo.it

UK Construction Week
May 3-5, 2022
London
UK
ukconstructionweek.com

Hillhead
June 21-23, 2022
Buxton
UK
www.hillhead.com

Bauma
October 24-30, 2022
Munich, Germany
www.bauma.de

EUROPE

Manufacturers call a firm halt in Russia

PHOTO: ADOBE IMAGES

Hitachi, Komatsu and JCB among firms ceasing their operations in Russia, following its invasion of Ukraine

Construction equipment manufacturers are joining the surge of Western companies winding down their operations in Russia, following its decision to invade neighbouring Ukraine.

Hitachi Construction Machinery, Komatsu and JCB have all announced decisions to suspend operations in the country, for the time being.

Hitachi Construction Machinery said it is winding down, but will continue to monitor developments in Russia and Ukraine, in the hope of a peaceful resolution.

In its statement, Hitachi said, "Our highest priority is on the safety of our stakeholders, including our group employees and their families, customers, dealers, and supply chain partners.

"We are committed to making the appropriate decisions as possible based on collection of information and close communication with our bases worldwide."

Komatsu said it was suspending shipments to Russia because of "the current supply chain disruption and the uncertainty of the financial and economic situation."

The company has set up an emergency task force, headed by its President and CEO Hiroyuki Ogawa, to gather information and discuss any future measures.

Earlier, JCB said it had "paused all operations [in Russia], including the export of machines and spare parts." ce

GREECE

Contract for €8bn 'Athens Riviera' awarded

Mace and Jacobs have been appointed as the programme and project management consultants for buildings, for the €8 billion regeneration of the former Athens airport and the neighbouring coastal are known as the Ellinikon.

Described as one of the greatest urban regeneration projects in Europe and the largest ever undertaken in Greece, The Ellinikon project will see the transformation of an area totalling more than six million square metres and 3.5km of coastline.

As well as the city's old disused airport, it includes the redevelopment of the area's two-million-square-metre Metropolitan Park and the Marina Tower, aiming to transform them into an 'Athens riviera' that will have, "one of the largest coastal parks in the world."

Acting as a joint venture firm called Mace Jacobs, the companies were appointed to the project by Lamda Development subsidiary Hellinikon.

Lamda Development CEO, Odisseas Athanasiou, said, "The joint talent and experience of Lamda and Mace Jacobs will ensure a successful timely delivery of a green, sustainable and smart city with excellent quality of life, exceptional landmark buildings and properties, while transferring knowledge, know-how and new construction techniques to the Greek market over the coming years." ce

IMAGE: MACE

An impression of The Ellinikon project in Athens

EUROPE

CECE report: 24% growth in machine sales

Sales of construction equipment in Europe rose by 24% in 2021, according to the latest figures from industry association CECE (the Committee for European Construction Equipment). Sales were up by more than 20% across all product segments, with concrete machinery the highest climber.

CECE said it was impossible to measure economic consequences of Russia's invasion of Ukraine.

Riccardo Viaggi, secretary general of CECE, said; "We know that these tragic events will have negative economic consequences…and the sanctions and political tensions will make business between Russia and Europe more difficult."

Regarding 2021 sales, from a regional perspective, the UK and Spain saw strong growth in equipment sales throughout 2021, while Turkey saw the highest growth of 76.5%. Germany grew, but was the only country rise by only single digits (9%).

The Greek container port at Thessaloniki has awarded a €150m contract for expansion work, aimed at increasing its capacity to 24,000 TEU (twenty-foot equivalent units).

Mytilineos will undertake the project in partnership with Rover Maritime and HDK, with the scope of work including the construction of an additional quay wall. The new wall will be 513m long, of which 470m will have a depth of 17.7m.

The port expansion work - as well as an additional yard and infrastructure work - will start this year and be completed in 2025, and is expected to support the creation of some 3,300 jobs.

PHOTO: THESSALONIKI PORT AUTHORITY

EUROPE

Optimistic outlook for construction

Contractor survey shows confidence remains in the European market despite the ongoing supply chain issues

A survey of European construction contractors, undertaken by industry analyst ING, has found that most believe demand will increase through 2022, generally achieving pre-Covid levels.

The positive survey response mirrors the European Union's own Eurostat forecast of an average 2.5% growth across the EU in 2022.

This optimism comes despite ongoing issues for the industry, such as materials shortages and energy and materials price rises in most countries.

ING reported, "In August, a record percentage [18%] of EU contractors indicated lower production due to a lack of building materials or at least a delay in their delivery. This percentage shot up [29%] in January 2022, with the highest shortages in France and Germany."

The situation in France is challenging as the government has introduced regulations requiring at least 50% of material used in the construction of public buildings to be either timber or other bio-based materials.

PHOTO: LIEBHERR

ING said Germany, Austria and the Netherlands are seeing increasing demand, which is putting pressure on supply chains. This, the company said, is partly due to the 'zero-Covid' policies of China, which has reduced the movement of materials in ports.

Conversely, ING reported very few construction companies in Belgium, Spain and Turkey reporting materials shortages. ce

FRANCE

Vinci goes quietly in Monaco

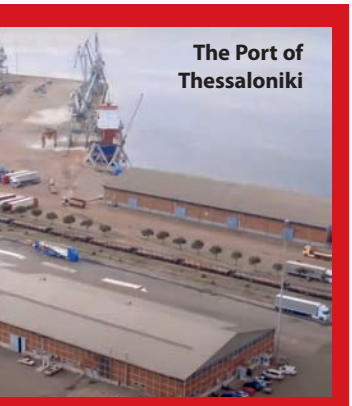
Vinci Construction has been awarded a €98m contract to work on the structure, core and shell of an extension building for the Princess Grace Hospital in Monaco.

With the work taking place in a densely-populated part of the Principality, adjacent to the operating hospital, the contractor says it will build a dome over the initial earthmoving work, to reduce construction noise levels.

The structure of the dome will include 70 cables, each of 37m, over which will be erected 2,800m^2 of sound-absorbing sheets, capable, says Vinci, of reducing noise by up to 12 decibels.

The contract includes a 16-storey building, with a 65,000m^2 footprint, plus an underground car park on six levels.

The four-year project will include the use of BIM across all works teams, and 85% of the concrete used will be Exegy low-carbon concrete, which promises to reduce greenhouse gas emissions by approximately 30%. ce



The Port of Thessaloniki

IMAGE: AIA ARCHITECTS

An impression of the proposed extension to the Princess Grace Hospital in Monaco

NIBS

IMAGE: SALTO DE CHIRA

SPAIN CANARY ISLAND'S HYDRO PROJECT

Construction is underway on the Salto de Chira pumped hydro energy storage (PHES) plant on the Spanish island of Gran Canaria. As well as the hydroelectric plant, the project includes the construction of a seawater desalination station and associated marine works, as well as facilities for the plant's connection to the hydrological transport network. Around 90% of the project's infrastructure will be installed underground, minimsing its visual impact.

ITALY SAMOTER CONFIRMS DATES IN 2023

The 31st edition of Samoter will be on 3-7 May 2023 in Verona, Italy. The organisers had originally delayed the event to March 2023. "We have a date at last for the return of SaMoTer after the long pit stop caused by the most acute phase of the pandemic," said Giovanni Mantovani, CEO of Veronafiere. "The supply chain was significantly impacted by the cancellation of one of its landmark professional events in Europe. Trade fairs continue to confirm their role as one of the main tools for promoting business."

IMAGE: DERWENT LONDON

UK LONDON SET FOR NEW HIGH-RISE

Laing O'Rourke will start construction in June of the 19-35 Baker Street mixed use development in London, UK. Laing's €190 million contract with developer Derwent London calls for completion of the project in the first half of 2025. The 10-storey scheme, designed by Hopkins Architects, has been developed with a design for manufacturer and assembly (DfMA) strategy, with a focus on increasing the efficiency of the manufacture and assembly of the building's components.

UK CONSTRUCTION TO PAY FOR SAFETY

New laws intended to make construction industry operators pay for building safety violations and/or failures have been unveiled by the UK Government. The proposed measures are designed to protect leaseholders from the "exorbitant costs" associated with repairing unsafe buildings. The laws, proposed in the wake of the Grenfell Tower tragedy in London in 2017, will ensure that "no leaseholder living in their own home, or sub-letting in a building over 11m, ever pays a penny for the removal of dangerous cladding".

Rail infrastructure is set to receive significant investment in Croatia

PHOTO: ADOBE IMAGES

CROATIA

Covid recovery funds to aid Croatian rail

Key projects earmarked to receive €224 million of the country's EU package

Croatia says it will implement a rail investment plan, with a number of key rail projects set to receive an initial €224 million boost from the EU's Recovery and Resilience Plan (RRP).

Josip Bilaver, the State Secretary for Sea and EU funds, said, "A large part of the funds is directed to the railway transport, in which, due to the development of motorways, no significant investments were made until a few years ago."

The largest of these projects comprises phases 2 and 3 of the reconstruction and construction of the second track on the 72 km Dugo Selo – Novska rail line.

Another project expected to be financed under the RRP is the reconstruction of the M604 Oštarije – Knin – Split rail line. The scope of work will include the modernisation of three stations on the line connecting Karlovac County with the region of Dalmatia, plus track renewal and the installation of new signalling and interlocking devices.

The funding programme also includes a plan to remove bottlenecks on railway infrastructure.

In total, 146 investments and 76 reforms in Croatia will be supported by €6.3 billion in RRP grants. Of these, more than 40% will support climate objectives and approximately 20% will aid the digital transition. ce

EVENTS

construction TECHNOLOGY SUMMIT2022

Third speaker confirmed for ConTech summit

Oracle's Frank Weiss to speak at KHL's virtual event on April 21

It has been announced that Frank Weiss, Senior Director, New Products, BIM and Innovation at Oracle Construction and Engineering, will be speaking at KHL's Construction Technology summit on April 21.

Before joining Oracle Construction and Engineering in 2018 he was the co-founder of Conject, a company for project collaboration in construction, founded in Munich in 2000. While at Conject he opened numerous international offices, but remained faithful to his passion for product management. As an experienced entrepreneur, he is known for his focus on IT and Software as a service (SaaS) for the construction industry.

Weiss represents Oracle as a Strategic Advisory Council Member at buildingSMART International, and has launched several standardisation initiatives such as DIN Spec 91391 and openCDE APIs. Currently he focuses on CDE, Digital Twins, Smart Cities, GIS, Integration and others.

The free to attend event, taking place at 4.00pm Brussels time on April 21, will examine digital construction in the real world and how contractors can practically digitise their workflows.

Two other speakers have already been announced – Paul Surin, global engineering, construction, operations and BIM segment lead with IBM and Dr Marzia Bolpagni, Head of BIM International at Mace.

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.

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

US

Cat suspends manufacturing in Russia

Caterpillar has issued a statement on Russia and the Ukraine in which it said it was suspending manufacturing operations in Russia and making a significant financial donation toward relief efforts in Ukraine through the Caterpillar Foundation.

The company's statement said, "We are deeply saddened by the tragic events continuing to occur in Ukraine and hope for a peaceful resolution to the crisis. Through the Caterpillar Foundation, we are donating more than $1 million to support both urgent and long-term needs of the Ukraine humanitarian crisis.

"We are complying with all applicable laws and evolving sanctions, while remaining focused on our employees, dealers and customers.

"Operations in Russia have become increasingly challenging, including supply chain disruptions and sanctions, and we are suspending operations in our Russian manufacturing facilities.

"We recognise this is a time of incredible uncertainty for our valued employees, and we will continue to look for ways to support them."

Caterpillar has been operating a fully owned manufacturing facility in Tosno, near Saint Petersburg, since March 2000. ce

PHOTO: CATERPILLAR

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Earthmoving machines

NASA to fund moon-based construction

The National Aeronautics and Space Administration (NASA) has announced funding for the development of construction technologies to help humans live and work on the Moon.

Three US universities will each receive US$2 million for research into the use of lunar resources for construction and advanced electronics that could continue to function in the extremely cold temperatures found on the Moon.

The research teams will have two years to complete the development of the chosen technologies.

Through its Tipping Point programme, NASA is also investing US$200 million to help push new space-based technologies to the market - with Moon-based infrastructure again high on the agenda.

Under the programme, NASA will award funding to multiple companies using Space Act Agreements.

The investment will help companies develop technology for the lunar space station and offer businesses an opportunity to work with agency experts or use facilities through a separate Announcement of Collaboration Opportunity.

The focus will be on the technological development for space infrastructure and capabilities for the Moon and near-Earth space – looking in particular at autonomous construction on the lunar surface. NASA has also said they will consider proposals for infrastructure and capabilities in Earth orbit.

Advancing robotic technology for construction in space will minimise the risk for astronauts in dangerous environments and will enable NASA to use technology to extract resources, as part of its Artemis programme, which will include two lunar missions.

More than half a billion US dollars have been awarded to 50 projects since NASA began the Tipping Point programme back in 2015.

Illustration of Artemis astronauts carrying out operations on the Moon
PHOTO: NASA WEBSITE

PHOTO: ADOBE STOCK

Artistic impression of an EV-charging road

Jacobs working on first electric charging road in the US

One-mile stretch of road in Michigan, US, to be capable of dynamic and stationary wireless electric vehicle charging

A consortium has been selected by the Michigan Department of Transportation (MDOT) to develop and implement an inductive vehicle charging pilot – said to be the first of its kind in the US.

Jacobs is the engineering partner, providing project management and design services to deliver the one-mile stretch of road from development through to operation.

The project team will be led by Electreon, a provider of wireless charging solutions for electric vehicles (EVs). The road will feature embedded coils under the road pavement, together with semi-dynamic charging stations at end-point terminals. These will charge vehicles while stationary in a queuing or parking lane.

The consortium will design and build the one-mile road of dynamic and stationary wireless EV charging technology in Detroit, hosted by the Michigan Central mobility innovation district.

"As the world transitions to the future of electrified transportation, cities and communities are seeking and adopting green economic-centric models as part of the transformation," said Jacobs People and Places Solutions Americas Senior Vice President, Ron Williams.

"This innovative pilot project aims to demonstrate efficient vehicle operability to prove the viability of wireless EV charging. Jacobs is committed to delivering decarbonization solutions to address the increasingly critical issue of climate change."

ce

Trimble's new interoperable design software

Trimble has announced the Trimble jobsite connectivity bundle – a software bundle that links 3D models and data across Trimble civil construction hardware and software solutions.

The technology, software and services company said that the interoperability of the bundle makes it easy

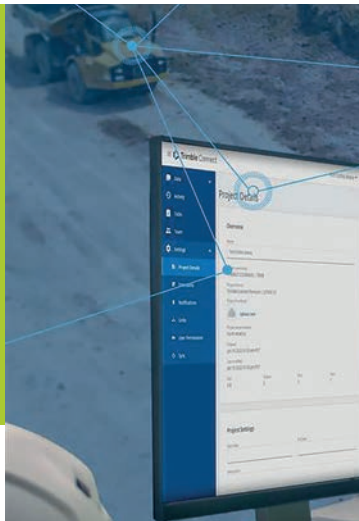

PHOTO: TRIMBLE

The remote island of Shetland is where BAM is testing out a private 5G network on its construction site

Project testing use of 5G technology

The contractor BAM Nuttall, part of Royal BAM Group, is using a private, stand-alone 5G network on a construction site for the first time in the UK.

Working in partnership with Attocore and Building Research Establishment (BRE), on the island of Shetland, Scotland, BAM Nuttall's project team is designing and constructing the civils infrastructure at Kergord on Shetland for SSEN Transmission's HVDC convertor station and substation.

Part of the Shetland HVDC link, this major link between Shetland and the Scottish mainland will feed renewable energy to the electricity grid and connect Shetland to Great Britain's grid for the first time.

The 5G network, funded by the Department for Digital, Culture, Media & Sport (DCMS), aims to test the potential of new digital technology.

The project site provides the ideal conditions to measure the benefits of 5G for the construction industry; weather conditions are cold, wet, and harsh; winter's daylight hours are short; clients and management teams can't easily visit the site and rely on reports, data, images, and insights to track progress and make decisions.

BAM's project team is collecting evidence of how new technology can help improve safety, sustainability and increase collaboration and create more effective and efficient solutions.

Colin Evison, head of innovation at BAM Nuttall said, "5G is unlocking increased use of digital tools and models as we explore safer, more modern and efficient ways to work in construction. We're excited for the next steps as we trial new solutions which, without the 5G network, wouldn't be possible.

"We're looking forward to seeing the results and ultimately sharing the benefits across wider industry."

First digital twin of an entire country

Digital twin made of the densely populated island nation of Singapore

Work has been completed on what is said to be the first digital twin of a whole country, with Bentley Systems tools helping to create a digital twin of Singapore.

The Singapore Land Authority (SLA), which manages land use on the densely populated island nation, found that, with above ground and below ground buildings and infrastructure growing and overlapping, 2D maps could not convey accurate GIS information.

GPS Lands Singapore approached SLA with the proposal to develop the Singapore Digital Twin. Mapping teams used aircraft with laser-scanning capabilities to capture digital terrain and surface data.

Vehicle-mounted laser scans supplemented the aerial imagery with street-level data to greatly improve map detail. GPS Lands Singapore then assisted to combine all data sets into a single platform, allowing users to view and verify the information.

The digital twin now displays all parts of Singapore in highly detailed 3D representations. The full map is now exported and shared with various government agencies to help with asset management and decision-making, including detailed tree and green space management.

GPS Lands Singapore imported all point cloud data and panoramic images into its Singapore Digital Twin platform using Orbit 3DM Content Manager. The application allowed the mapping team to verify large-scale data sets to detect and resolve any mismatched data. ce

Singapore has become the first country to have its own digital twin

PHOTO: ADOBE STOCK

for users to synchronise projects and data with Trimble Connect to share and collaborate on construction files.

Elwyn McLachlan, vice president for Trimble Civil Software, said, "The future of construction is digital, and the release of the Trimble Jobsite Connectivity Bundle is a significant step forward in terms of making sharing and collaborating on 3D designs and project data faster, easier, more reliable, and more efficient."

Additionally, the interoperability of the new bundle extends to other software solutions integrated with Trimble Connect, including SketchUp, Trimble Quadri BIMsoftware, and third-party solutions.

Trimble added that contractors using non-Trimble design software can benefit from using the Trimble Connect Software Developer Kit (SDK) to integrate third-party applications with Trimble civil construction software.

OUTLOOK FOR GERMAN CONSTRUCTION

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

After a modest GDP contraction in the fourth quarter of 2021 linked to re-tightened pandemic restrictions, German economic growth is resuming. However, Russia's invasion of Ukraine will curtail this rebound due to a renewed worsening of global supply chain problems and an associated inflation boost.

The latest leading indicators signal a pronounced service-sector recovery, while manufacturing will be set back by far-reaching sanctions on Russia and the fresh geopolitical uncertainty that the war has triggered. The inflation forecast now appears even worse than in mid-February; we now expect the broad price level to increase over 5.0% given the war and rising wage-price spiral risks. The acute geopolitical threat posed by Russia is forcing the German government to drastically recalibrate its fiscal and investment agenda.

The most construction PMI needs to be viewed with some caution as it predates active hostilities in Ukraine. February saw an upturn in construction activity across Germany, with the sector recording its strongest performance in two years. With intakes of new work also rising, capacity expansion efforts led to a marked and accelerated increase in employment. Less positively, latest data showed an uptick in the rate of input cost inflation for the first time in four months, driven in part by a worsening of supply bottlenecks. This was reflected in a drop in business expectations for the coming year.

COMMERCIAL GROWTH

There were notable increases in activity across each of the three broad construction categories – residential, commercial and infrastructure. Growth was led by the commercial segment, which recorded its sharpest rise in activity for over four years. It was followed closely by infrastructure, the rate of expansion of which picked up to the quickest since July 2017. Housing activity was the laggard in February, its rate of growth having slowed notably.

The construction sector faced an intensification of cost pressures in February. After slowing in each of the previous three months, the rate of input price inflation climbed to its highest since last November. Businesses reported paying more for a range of building materials, including bricks, insulation, timber and a range of metals, alongside higher energy prices.

February's survey showed an increase in the incidence of supply delays, the first time this has been the case for nine months. Concerns over rising prices weighed on constructors'

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 The calm before the storm in Ukraine

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The January barometer survey was undertaken during the first three weeks of February.

This survey closed just before Russia invaded Ukraine, so the relative sense of optimism must be tempered by what has come since.

At this point, there is no knowing what impact the current conflict will have on construction markets in Europe.

During the month of February, industry professionals looked back at the previous month and saw strengthening business.

Whereas, in the previous month, only 20.8% of respondents saw improving business levels, this month saw 37.1% of respondents reporting growth.

Likewise, 21.0% reported a fall in business levels, compared with 27.8% in the previous month.

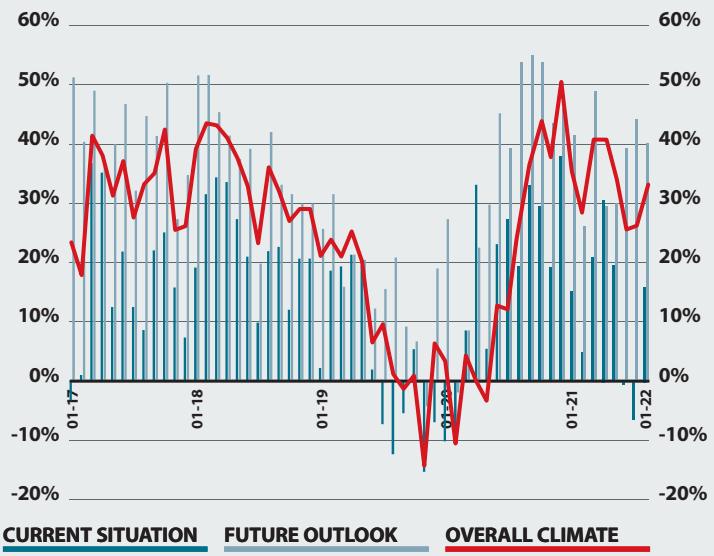
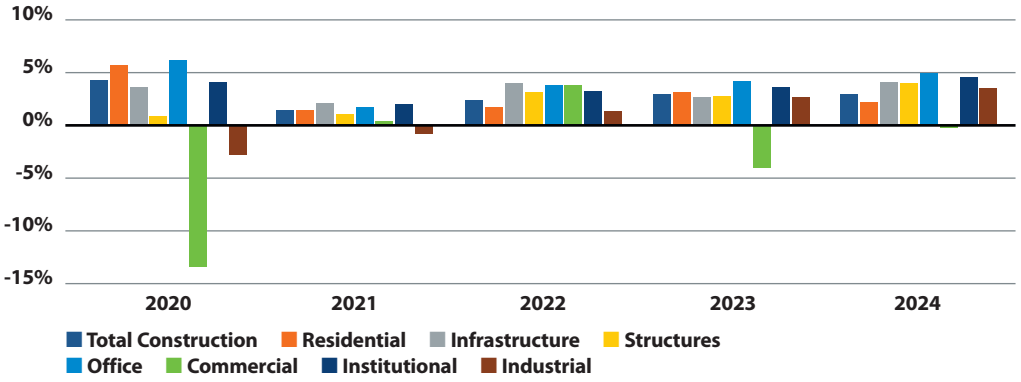


PHOTO: ADOBE IMAGES

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



confidence in February with more firms expecting a decrease in activity over the next 12 months than those expecting a rise.

Fixed investment suffered less from the pandemic than expected, due to the relative resilience of construction, which constitutes 53% of fixed investment. In 2020, investment in construction grew, while equipment spending fell by 12.3%. This outperformance of construction was corrected only partially in 2021, which was also hindered by building material shortages.

HOUSING DEMAND

Looking ahead, construction demand will remain supported by pent-up housing demand, migrant needs, historically low interest rates, and additional public spending on transport, energy, IT infrastructure, and the military.

The outlook for German construction is for continued improvements, but relatively slow growth. Total real construction spending likely slowed to 1.5% in 2021 after a solid 4.5% gain in 2020. IHS Markit expects growth to improve to 2.4% in 2022 with a bit stronger bounce to 2.9% in 2023.

Were it not for the outbreak of war in Ukraine, we would likely have been raising construction forecasts for 2022 and 2023, given favourable financing conditions and rising demand for all three construction sectors – infrastructure due to major investment plans of the new government, regarding the modernisation and structural change to energy, transport, and digital infrastructure; residential due to persisting pent-up demand for housing; non-residential structures due to the cyclical upswing after the loosening of COVID-19 restrictions.

While these supportive influences will not vanish completely, the risk remains for even more drastic sanctions (like an energy import embargo from Russia) to be imposed.

Around 20 January, the German Economic Ministry ended a subsidy program for energy-efficient housing because a landslide of applications far exceeded the pool of funds that had been allocated. The criteria (in terms of levels of energy efficiency needed to qualify) had been far too lenient. As such, homebuilders suddenly have a gap in their financing plans, even as building costs soar. This further impinges on existing affordability issues, particularly as inflation outpaces wage gains, and diminishes the potential for residential construction.

Office construction offers sustained improvement as the passing of the pandemic allows for return-to-office planning. With some permanent reduction to in-office time, the recovery will be muted. It will take several years to rationalize the current office stock with projected in-office hours. The greatest challenge is to the commercial sector.

There may be some base effect growth in 2022 as the hospitality industry recovers from its deep pandemic slump. However, the retail sector will be a hindrance to growth as e-commerce consumes an ever-larger share of wallet and conventional store growth falls. While warehousing and logistics will see strong growth, the value of these structures is less than that of retail with a net negative effect. Institutional spending will slightly outpace overall structural spending as health care and educational structures grow with the overall economy but incorporate additional architectural features to allow greater resiliency to disease and improved energy efficiency.

DEFENCE SPENDING

Infrastructure also recovers as the end of COVID-support spending allows for funds to be re-purposed, particularly into energy and transportation projects. Germany's new government has made infrastructure a priority, although it now remains to be seen whether the need for additional defence spending requires some re-assessment and re-allocation of investment plans.

The German economy is heavily tied to manufacturing. While some new investment has moved to Eastern European countries, such as Poland, domestic investment remains critical. To better see the evolution of priorities, construction spending is grouped in five-year increments above.

Overall, manufacturing will become less important to the construction economy as the rate of growth recedes over the next decade. However, utilities will be a winner as Germany not only works toward a net zero economy itself, but also exports that technology.

As energy independence is achieved, refining becomes less important. Some petroleum-based activity will remain to support the chemical industry, which will also see growth. Transportation equipment investment may tail off as plants complete transition to EVs with fewer parts, but the electrical and electronics industries will pick up some of that slack. ce

CE JANUARY 2022 SURVEY RESULTS

As a balance figure, with 0% being the status quo, the barometer saw a rise of 16.1%.

Looking back to this time last year, however, there is little movement from the previous month, with 54.8% reporting growth (0.6% up on the previous survey).

Those reporting slower business than a year ago was also slightly up, at 14.5%, compared with 12.5% in the previous barometer.

Again, looking ahead, there is not a significant change in confidence for the year ahead, but what change there is is negative.

54.8% of respondents forecast better business a year from now, compared with 56.9% in the previous survey.

Respondents predicting a fall in business activity rose 2% to 14.5%.

In all, a relatively static barometer, but next month's response almost certainly will not be.

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.

HEAVY MACHINES MAKING LIGHT WORK

First you dig, then you load, then you haul. Sounds simple, but today's earthmoving machines are really anything but simple – they are simply better by design, as Mike Hayes **reports**

PHOTO: CASE CONSTRUCTION EQUIPMENT

Case's E Series crawler excavators boast engine advances, care of partner FTP, ensuring a lower total cost of ownership

With so many challenges facing the European construction market – the horrific situation in Ukraine, no end in sight to materials and skills shortages, and ongoing issues brought about by the coronavirus pandemic – one might be forgiven for assuming construction is an industry in decline.

On the contrary, these very challenging circumstances are barely managing to hold back the growth of construction companies, who are largely sitting on significant order books.

At this time, most manufacturers of earthmoving equipment are finding it impossible to meet demand. Nevertheless, new machines are being released, to feed a European market expected to be buoyed by the roll out of recovery packages from the European Union.

THE POWER TO DIG

Case recently announced the launch of its new E-Series crawler excavator range, which includes seven new models, culminating with the 30 tonne CX300E.

With strengthened machine structure and undercarriage, Stage V engines and enhanced cabs, plus improved hydraulics controls and settings, the range also comes with Case's Service Solutions, which the company says will lead to greater machine uptime.

A bidirectional modem on the machine operates with the fleet management software, Case SiteConnect and SiteWatchTM. This solution promises geolocation and fleet security (including unauthorised use alerts).

Reports can be delivered on fuel consumption, utilisation rate, machine hours and idle time, with data available via a portal. Experts from Case's Uptime Center team are also able to send alerts based on machine performance to dealers who can potentially access machine data remotely and take corrective action.

With emissions being top of mind for most European construction businesses, Case has utilised its long-standing partnership with powertrain specialist FPT, to produce more powerful and efficient engines across the range, with the 21-30-tonne models hosting 6.7 litre models.

Egidio Galano, a construction equipment director with Case's parent company, CNH Industrial, describes the engines as "…a solution free from exhaust gas recirculation, ensuring greater efficiency during the fuel combustion.

"When coupled with selective catalytic reduction on the filter, the E-Series delivers unprecedented total cost of ownership improvements."

Case insists that, when running the machines in Eco mode, they are capable of delivering fuel savings of up to 17%.

TOOL CARRIERS

Another crawler excavator launch this year comes from Doosan, who revealed three new 23-25 tonne Stage V machines.

The 23.3 tonne DX235LC-7 and the heavier 25.7 tonne DX255LC-7 conventional swing excavators are complemented by the 24.3 tonne DX235LCR-7 reduced radius model and all models promise what Doosan calls "significantly higher performance in every area", compared with their Stage IV predecessors.

The reduced radius DX235LCR-7 has a swing radius of just 1724mm, designed for heavy work either close to buildings or in the often confined spaces on road and rail projects.

All of the new models can operate with tiltrotators and have a new Tiltrotator Mode on the control panel, intended to ensure optimised hydraulic flow for the attachment.

Due to the higher lifting capacities of the machines, Doosan has incorporated a heavy 5.0 tonne counterweight as standard on two of the models, and a 6.4 tonne counterweight on the reduced radius DX235LCR-7. The company says the heavier counterweights make the machines particular suited to operating with heavier attachments, such as tiltrotators.

A Fine Swing function is another new feature across the three machines, aimed at minimising the shaking that inevitably occurs at the beginning or end of a swing movement.

A raft of new features inside the cab will also please operators. They include a 20mm touch screen, DAB audio (handsfree and Bluetooth), keyless start, a heated seat (with cooling as an option), 8 LED work lights and ultrasonic detection of obstacles as an option on all but the DX235LCR-7.

ERGONOMICS AT WORK

Inside the cab is also a good place to start when looking at Sany's latest crawler >

> "New machines are being released to feed a European market ...buoyed by recovery packages from the EU"

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excavator, the 32 tonne SY305C.

The company speaks proudly of the user experience within the new machine, and operators will appreciate the 25mm touch display, which not only delivers machine data, but also shows images from the excavator's two cameras.

The cab also boasts an air-suspension seat with continuously adjustable heating. Control elements are also connected to the seat, making for an ergonomic workspace.

Other comforts inside the cab include optimised insulation, reducing noise and dust, while an air-conditioning system and a chilled compartment behind the operator's seat, help to keep things cool.

Beyond the cab, the SY305C's Stage V-compliant drive unit is made by Cummins and has a combination of SCR (selective catalytic reduction) and DPF (diesel particulate filter) technology.

Doosan says the reduced swing radius on its DX235LC-7 makes it an ideal machine for large urban or road and rail projects PHOTO: DOOSAN

Sany's SY305C will benefit from automatic air conditioning and a chiller cabinet behind their seat – how cool is that? PHOTO: SANY

Sany says the machine's lack of EGR (exhaust gas recirculation) results in maximum productivity and minimal fuel consumption.

The unit needs no additional cooling units, making it more compact and allowing for optimal visibility to the rear of the machine.

Quick tool changeovers are another feature of the excavator, with a hydraulic quick-coupler preparation included as standard. Sany says the hammer value can be changed with the touch of a single button, when changing from a hammer to shears.

TAKING THE STRAIN

In December last year, Cat launched its electric drive 988K XE wheeled loader.

Key features of the machine include an increase in downhill speed of up to 10% and increased hydraulic breakout force for up to 5% better production.

The Rimpull Control feature allows operators to adjust the machine's torque up or down to match the underfoot conditions.

The updated design of the 988K also helps to improve cycle times, while an option counterweight increases stability and improves manoeuvrability.

The new machine has three braking levels, which operators can adjust with single right-hand pedal operation. In addition, Cat says its tyre slip prevention system will reduce wear and lower operating costs.

>

A BRAND NEW BRAND

Volvo Group acquired the Scotland-based Terex Trucks business in 2014. Now, eight years later the group is rebooting the branded as Rokbak.

Following significant investment in the products and the manufacturing process, the company has launched its first machines carrying the new livery, the RA30 and RA40 haulers.

The larger of the two, the RA40, is powered by a Scania DC13 engine, with a gross power of 331kW, a maximum torque of 2,255Nm and a 38 tonne payload.

The smaller RA30 has a 28 tonne capacity and is powered by a Scania DC9 engine, with gross power of 276kW and a maximum torque of 1,880Nm.

Both machines meet EU Stage V emissions standards and boast adaptive shifting transmission to provide enhanced fuel economy.

Rokbak says the first machines have now been delivered to customers in Europe, with two haulers now at work on a high-speed rail link project between France and Italy.

Rokbak sales director Guy Wilson says, "Europe holds many exciting opportunities for us. The European articulated hauler market has increased 60% over the last year and we have seen particularly robust growth in this region – especially in the UK and France – driven by large infrastructure projects. Given the significant growth in our order book, we are feeling very optimistic for 2022."

Rokbak is looking to make its mark on the European hauler market with its new-look RA30 and RA40 machines PHOTO: ROKBAK

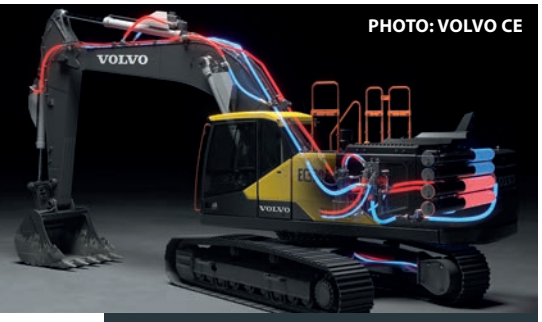


PHOTO: VOLVO CE

The award-winning new electro-hydraulic system from Volvo CE

VOLVO TAKES HYDRAULICS TO NEW HEIGHTS

Volvo has commended a new Common Pressure Rail Hybrid system for excavators in its technology awards, saying it results in both improved performance and a reduction in CO_2 emssions.

Volvo CE teams from Switzerland and South Korea combined with Finnish firm Norrhydro to develop the system, which originated as an academic project.

In the system, all of the machine's functions are connected to hydraulic accumulators via a common pressure rail, comprising two or more pressure lines. For cylinder-driven functions, 'smart actuators' are used to convert hydraulic power to force and speed in an energy-efficient way.

The company said real-world customer trials were now taking place on the system, with its continued development expected to accelerate the introduction of e-mobility across its larger excavators.

Lars Stenqvist, CTO Volvo Group, said, "This innovation enables Volvo CE to offer its customers a truly unique electro-hydraulic solution, pushing fuel efficiency to new levels. It's demonstrating the passion of our engineers to bring forward customer-oriented solutions and systems that will drive the transformation towards net-zero emissions operations".

The new Liebherr TA230 articulated dump truck has enhanced body and cab design to improve visibility
PHOTO: LIEBHERR

Other features include the switch reluctance electric drive technology which increases overall efficiency by 25%. While the electric drive helps to reduce emissions, Economy mode operation of the Cat C18 engine helps to reduce fuel consumption.

Caterpillar says greenhouse gas reduction using the electric over mechanical drive are equivalent to a year of electricity usage for about 10 homes.

PUT TO THE TEST

CE's test driver Dan Gilkes put Liebherr's new TA230 ADT (articulated dump truck) through its paces recently and was impressed to find that Liebherr had reduced the size of the dump body from 19m³ to a class-competitive 18m³.

"The payload is set at 28 tonnes," he said, "and the machine will come with Liebherr's load weighing system, with lights outside the cab to tell the loading operator when the truck is up to weight."

The TA230 has permanent six-wheel drive and there are both inter-axle and cross axle differential locks, for maximum traction.

The transmission is mounted above the front axle, while all of the engine exhaust after-treatment is packaged high up behind the cab.

After driving the hauler, Gilkes noted, "To achieve that steeply sloping bonnet line, greatly improving forward visibility from the cab, the engine is tilted forwards by 7°, while all of the cooler cores and radiators are mounted to either side of the engine."

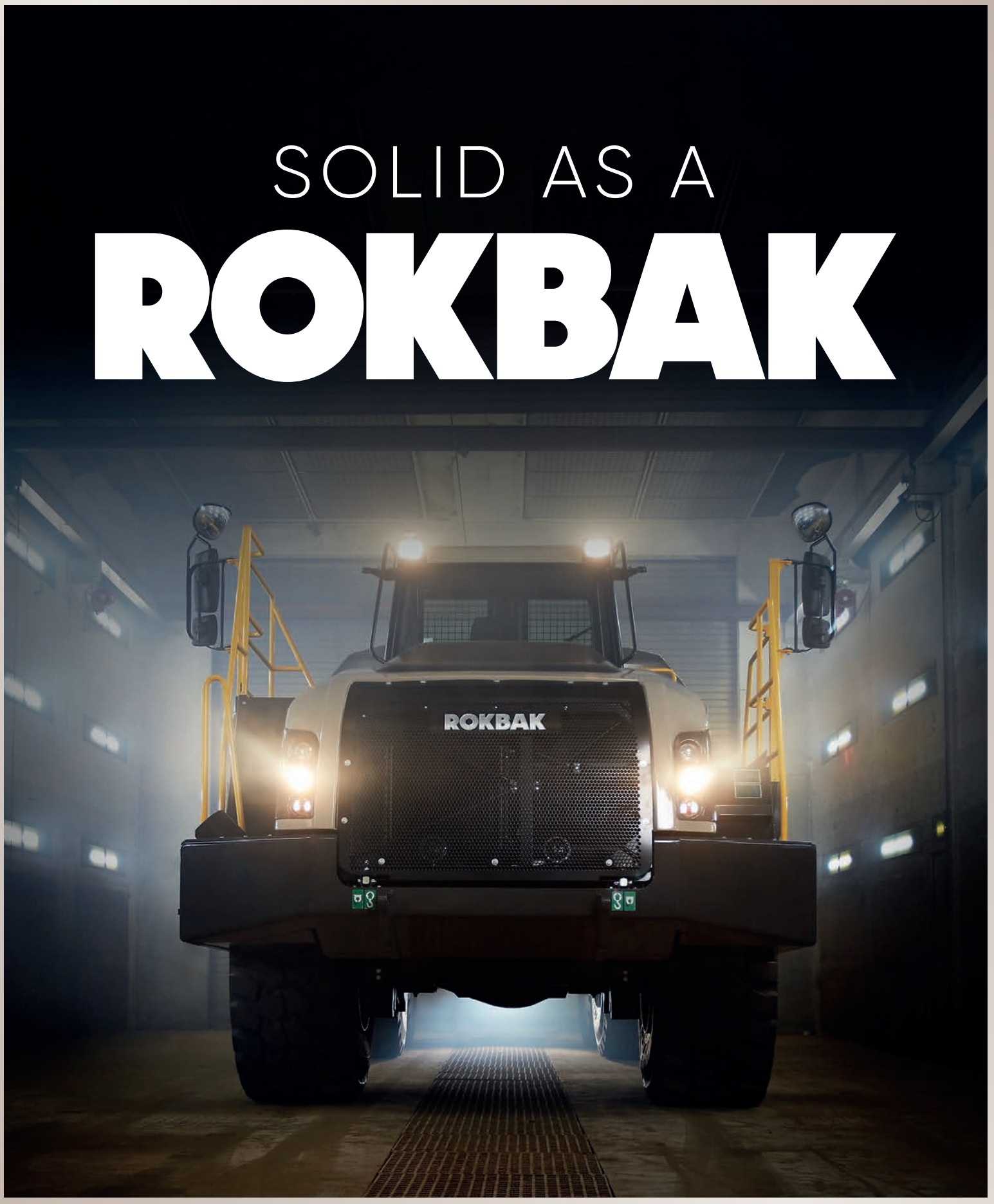
Complimenting the after-treatment system, he said, "The DPF has passive regeneration, so there is no need to stop the truck while burning off soot and it should last up to 5,000 hours before the need for a refurbishment or replacement."

Inside the cab, Gilkes found "the front windscreen now has a glass-to-glass join with the front quarter windows. This, in combination with the lower bonnet line and much smaller mirror supports, results in a panoramic view to the front and sides of the truck."

In summary, he said, "The ADT rides well, has plenty of pulling power and the traction to put that power to good use. The new cab is a comfortable place to spend the day and the truck promises the productivity to justify that badge. In a rapidly growing sector, Liebherr's new TA230 should do well." ce

Features on Cat's new 988K XE wheeled loader include Rimpull Control, allowing operators to adjust torque to match ground conditions
PHOTO: CATERPILLAR

SOLID AS A ROKBAK



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THE SUPPLY CHAIN REACTION

Supply chain disruptions are hitting hard in Europe and the conflict in Ukraine means companies will need to be resilient to weather another year of uncertainty. Catrin Jones **reports**

Across the globe, ongoing supply chain issues and operational disruptions are the main concern, according to sector professionals who responded to the Allianz Risk Barometer 2022. It was reported last year that surges in demand were accompanied by disruptions in production and logistics when factories were forced to close following Covid-19 outbreaks.

"The industry is facing a large number of challenges – at the top of which are supply chain bottlenecks and shortages of materials and staff," says Jonathan Tabor, head of construction and IDI, regional unit London and Nordics, at AGCS.

Ian Cooper, director and head of the construction sector at DWF PHOTO: DWF

LOSS OF OUTPUT ACROSS THE WIDER EUROZONE

Global supply chains, in recent years, have faced an unprecedented level of pressure. Continually rising prices, disruption to shipping and ports, material shortages, and Russia's invasion of Ukraine only puts further strain on global supply chains' ability to recover.

The Achilles Supply Chain Resilience Index (ASCRI) 2021 Q4 report stated that supply chain resilience further decreased in the final quarter of last year. Deteriorations were a result of Covid-19 concerns on the Omicron variant, a shift in purchasing behaviours, and ongoing logistical challenges.

It was predicted that ongoing commodity prices would continue to put stress on supply chains into 2022. Uncertainty over the Russia-Ukraine conflict was also a notable concern with apprehension over commodity prices

Supply chain disruptions are impacting countries across Europe
PHOTO: ADOBE STOCK

further increasing.

"The Russia-Ukraine conflict will accelerate the fracturing of global supply chains for construction which have already been severely tested by the global Coronavirus Pandemic," says Graham Robinson, Global Infrastructure and Construction Lead at Oxford Economics.

"A prolonged Russia-Ukraine conflict will put rocket boosters under inflation for construction materials across Europe and cause a significant loss of investor confidence and a loss of output across the wider Eurozone but concentrated in Eastern European countries."

> "A prolonged Russia-Ukraine conflict will put rocket boosters under inflation for construction materials."
>
> **Dave Hopkins, CEO of Timber Development UK**

The escalating conflict appears to be one of Europe's biggest risks. Prices have already started to respond accordingly and there are fears that there will be further price increases and shortages, both direct and indirect. The conflict will likely continue to drive decisions made throughout the supply chain across Europe.

Despite this, lumber shortages have been easing in Europe – the price of imported sawn or planed wood has since fallen by 9.3% since December.

The timber market has demonstrated increasing stability but with the EU-imposed sanctions on Belarus and the expectation that this will be matched for Russia, the industry is likely to suffer from tighter supply and shortages in some areas.

David Hopkins, CEO of Timber Development UK, advised members to cease trading with Russia and Belarus. In doing so, Hopkins recognises that this will disrupt timber supplies into Europe and to the UK market with Russia and Belarus accounting for around 10% of the softwood market in the continent.

WEATHERING THE CRISIS

Katie Tamblin, chief product officer at Achilles and author of the ASCRI report, said, "Supply chain data emerging from Q4 2021 was already indicating that 2022 would be a rocky road for global supply chains, and now with the additional conflict in Ukraine, the outlook is extremely concerning.

"Pummelled by so many challenges over the last two years, supply chains have not had time to recover, and we now face a critical tipping point that could have both supply and cost ramifications rippling through industrial and consumer markets for years to come."

Tamblin added, "Our data shows that to weather this crisis, organisations need visibility across their supply chains to identify vulnerabilities and alternative sources of supply."

Russia remains a key player in many companies' supply chains, yet those who can afford to do so, have opted to boycott the European giant. Due to the current supply chain disruption and uncertainty, both financially and economically, Komatsu is one of a number of construction equipment manufacturers making early statements about ceasing shipments to Russia for the time being.

Making decisions to cease shipment to Russia and having to resource materials from alternative suppliers is not a decision made lightly and thus puts pressure on other streams.

"The construction market could be

>

WILL THE SUPPLY-SIDE DISRUPTIONS EASE OR NOT?

Europe's major industry associations are constantly gathering data on supply chain issues, to disseminate to the industry.

CECE's economic expert, Sebastian Popp, spoke of the current challenges during a recent CECE economic webinar. He said, "The immediate effect [of supply chain disruptions in 2021] was that only a fraction of the potential business did materialise.

"When we look at the order intake of the industry, the theoretical potential would have been way higher – orders were much higher than what could be achieved because machines could not be built or be delivered in the proper way.

"This may be helpful in the medium term – it may prolong the growth trajectory, as it helps in uncertain times, like today, to have a strong order backlog."

PREPARE FOR THE WORST

Forward-thinking, inventory forecasting, and meticulous planning are advantageous for companies to plan for uncertain times and further disruption.

The France-based company, Evolis, stated in the CECE Annual Economic Report 2022 that equipment sales are slowly creeping up to the record levels reported in 2019 but the shortage of raw materials had a strong impact on the availability of equipment in the second half of 2021 which in turn slowed down invoicing.

PAINFUL TRUTH

CECE member, VDMA, also noted that severe supply-chain disruptions had a dampening effect on the market last year and with the supply-side not expected to ease rapidly, they will be unable to anticipate the potential for the coming year.

Commodity prices are likely to put a strain on supply chains
PHOTO: ADOBE STOCK

Popp added, "The forecast for 2022 is primarily uncertain because of the question: will the supply-side disruptions ease or not? Some manufacturers were even considering revising their forecasts downwards because they did not anticipate the availability of components improving significantly.

Overall, though, Popp did say he was optimistic that the worst of the supply-side bottlenecks were behind us.

overheating," says Ian Cooper, director and head of the construction sector at legal and business services provider DWF.

He adds, "The continued growth in activity, across all sectors, is putting a significant demand on the available supply chain to deliver. Whilst it is good news to see input cost inflation ease, the industry is very busy with contractor's order books full for at least the year ahead."

Commenting on the IHS Markit/CIPS UK Construction PMI for February 2022, Cooper says, "Consequently, it is no surprise that buying has increased as clients look to secure increasingly scarce construction delivery resources."

IMPROVING RESILIENCE

A survey by McKinsey, made up of senior supply-chain executives, reported that 93% of respondents intended to address the function of their supply chains – this would be done through a planned increase in inventory of critical products and the dual sourcing of raw materials.

Supply-chain planning wins have been attributed to the adoption of modern digital tools and using advanced technology. The survey stated that 75% of the construction sector had some analytics implemented in the past year, with more planned, but the sector is less than enthusiastic about further investment in digital supply chain technologies in the future.

Despite 2021 being a challenging year for most in the construction sector, figures from the IHS Markit and the Chartered Institute of Procurement and Supply (Cips) in February have demonstrated that manufacturing growth could be improving, with some supply chain pressures showing promising signs of easing, although slowly.

While the survey did find that input price inflation remained elevated, it highlighted reports in some areas of fewer raw material shortages.

As the conflict in Ukraine continues to cast a dark shadow over Europe, and demand for construction materials continues to be extremely high, it is imperative that construction businesses continue to be vigilant and proof themselves against ongoing supply chain pressures. ce

The construction sector faces more challenges due to conflict in the East.
PHOTO: UNSPLASH – CHRISTOPHER BURNS

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Leila Steed **looks at the latest niche and general construction attachments and the flexibility they can offer contractors**

THE RIGHT TOOLS FOR THE JOB

Having access to just a few key attachments can enable construction sector contractors to maximise profits, by taking on a wide variety of projects.

Vitally important when it comes to surviving in an industry that can be prone to rapid and volatile price shifts, the latest attachments on the European market lend themselves to an ever-increasing number of construction sector applications, both general and niche.

HYDRAULIC BREAKERS

For example, Caterpillar's new Performance Series Hammers are ideal for heavy-duty tasks such as demolition and quarrying.

The Cat H190 S and the H215 S models are the largest in the attachment range, which comprises seven other models, and offer 370 to 530 and 300 to 520 hammer

>

PHOTO: CATERPILLAR

The H215 S breaker from Caterpillar is designed for high production

blows per (bpm) minute respectively.

Built for high production, the models are said to deliver consistent breaking power and emit less waste from internal heat, which allows more power to be delivered to the tool.

In addition to featuring a buffering material that dampens vibration feedback to the carrier, the hammers can also be configured for joystick or pedal control to suit operator preferences.

"With piston and tool matched in diameter and mass, these new hammers offer increased power transmission frequency," says 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."

The H190 S and H215 S, which were launched in December in of last year, were specifically designed for use with Cat's next gen excavators.

Tabe's 200kg MT 195 delivers 875 to 1,200bpm. PHOTO: TABE

While the H190 S 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, the larger H215 S can be used with the 374 and 395 machines, weighted at between 65 and 120 tonnes.

SMALLER MODELS

In contrast, the latest hydraulic breakers from Spain-based equipment manufacturer Tabe are designed for smaller carriers.

The MT 195 and MT 800 can be mounted on machines weighing between 3 and 5 tonnes and 11 to 14 tonnes respectively.

Launched last year and retaining the monoblock (one-piece body) design Tabe is known for, both the MT 195 and MT 800 offer greater impact energy than previous models produced by the company.

"We launched new MT 195 and MT 800 models last year and, following this design, we are updating the rest of our light range," says a spokesperson from Tabe.

"The aim is to offer more efficient breakers, more powerful with less consumption of fuel."

While the 200kg MT 195 delivers 875 to 1,200bpm, the MT 800 is designed for use with excavators in the midi range, weighing 760kg and delivering between 500 and 875bpm.

Although hydraulic breakers may be the most common type of attachment on the European construction equipment market (not counting standard buckets of course) – used on everything from big industrial projects to home improvement works – shears and screening and crushing buckets play a key role in the heavy construction, demolition, recycling, quarrying and infrastructure sectors.

SHEARS

Over recent months a plethora of new models have hit the market. Among these is the Series II FS45 shear from Shearcore – a subsidiary of US-based Exodus Global.

The Series II FS45 shear, part of the manufacturer's Fortress mobile product range, is engineered to provide a high strength to weight ratio and incorporates nitrocarburized swivel component that help provide a long service life.

It is made from 6" high-yield structural plate steel and comprises a two-piece piercing tip with zipper seams and dowl pins, as well as a longer razor blade that sits outside of the guide blades.

Shearcore says, "The shear is designed with a significantly enlarged pivot group that eliminates the need for auto guide and dramatically improves performance and durability of the shear."

According to the manufacturer, the model is available in two different versions – the 5.4-tonne FS45R and the 5.13-tonne FS45S, which both offer a jaw opening of 711mm.

>

PHOTO: SHEARCORE

The Fortress FS45 shear from Exodus Global subsidiary Shearcore.

SNOW AND WINTER ATTACHMENTS

For contractors carrying out work in cold climates that are prone to snowfall, Doosan Bobcat's angle broom attachment can be used to sweep away light snow, dirt and dried mud and other debris.

Available in four widths that range from 132 to 213cm, the attachment can sweep flush to a kerb and also offers both forward and reverse rotation to sweep snow away from obstacles such as doors and gutters.

Particularly useful for businesses that provide ongoing services as part of framework contracts, the Bobcat angle broom (pictured on an L85 compact wheeled loader) is just one of an extensive and growing range of winter attachments offered by the manufacturer.

Katinka Kincses, Product Manager for Attachments at Doosan Bobcat EMEA, says, "There is a growing trend for municipalities and their contractors to use versatile solutions, with powerful compact machinery increasingly taking the place of manual labour."

Indeed, Bobcat's specialist winter range also includes snow blades and V-blades, snow pushers, snow blowers, scrapers and salt and sand spreaders.

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ATTACHMENTS THAT IMPRESS

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MASTERHITCH LAUNCHES CONCRETE POURER ATTACHMENT

When it comes to more niche attachments, leading UK quick hitch manufacturer Masterhitch Europe believes it has designed one with "several unique" features.

Its newly launched Masterhitch Concrete Pourer enables construction workers to pour up to one cubic metre of concrete – or another type of fluid material - evenly and easily.

The attachment features two spouts; one facing towards the machine and the other away from it, giving the operator a choice of how to pour it.

The unit, which can be supplied with a either a standard pin or quick hitch attachment, allows users to spread an even level of concrete in two directions, without the need for site workers to be "in the immediate vicinity" during the pouring.

This is something the manufacture says it hopes will "avoid future tragedies", such as the one that claimed the life of Nicholas Hall when, in 2016, he was crushed by an excavator bucket as it was pouring concrete at a site in Blantyre, Scotland".

Masterhitch's Engineering Manager, Sean Green, says, "Various customer feedback and research told us that this attachment was a very much needed product to enter the market.

"We began design work several months ago and held focus groups along the way with some of our top clients, getting them to test out the prototypes for themselves. This really helped us achieve the best possible product design."

The Concrete Pourer can be used with any carrier machine with an operating weight of between 8 and 24 tonnes, which according to the manufacturer, is something that cannot be done with other similar products on the market.

CRUSHING AND SCREENING BUCKETS

The main advantage of crusher buckets is that they give contractors the ability to crush and reuse materials onsite quickly, contributing to a reduction in waste and a more circular economy.

A case in point is the Rockcrusher bucket attachment from Rock.Zone.

It can handle a variety of materials including concrete, asphalt, glass and ceramics, natural rock and brick, as well as mixed inert material, making it suitable for demolition, quarrying, excavation, recycling, infrastructure and general construction applications, particularly on smaller sites.

The crusher bucket produces a consistent cube-shaped aggregate end product "with very little fines and flaky material", that contractors can either reuse on site or sell on.

With different sized models available (the RC 7R, RC 9R RC 11R, RC 13R) for excavators in the 12, 20, 25 and 35-tonne classes, the bucket offers an operating cost of "less than one Euro per tonne", says Rock.Zone.

According to Germany-based Rock.Zone, formerly known as Rokla, the Rockcrusher >

PHOTO: KINSHOFER/DEMAREC

Demarec's DXS scrap shear is ideal for demolition and scrap processing

Similarly, Demarec's DXS scrap shear is also designed for heavy duty tasks, such as demolition and scrap metal processing.

Described by manufacturer as the "strongest scrap shear on the market", the DXS scrap model is available in four sizes for mounting on excavators weighing between 18 and 80 tonnes.

It includes Demarec's patented DemaPower 2.0 cylinder, which is said to give the model the same performance as "shears one or two sizes up".

"This is because of our patented DemaPower 2.0 cylinder technique," says Demarec.

"Due to the DemaPower 2.0 cylinder with four pressure chambers and 25% more power in combination with a double-acting speed valve, which ensures extremely fast cycle times."

According to the manufacturer, which operates as part of Kinshofer Group, the DXS scrap shear also features an offset apex jaw design that enables it to start cutting the material as it is being compressed.

Once contractors are done breaking up all their onsite materials with shears and hammers, attention must then be paid to what to do with it next. Enter crushing and screening buckets.

TRANSPORTING CONSTRUCTION EQUIPMENT ATTACHMENTS

With onsite versatility the driving force behind the development of every attachment, Tobroco-Giant's latest attachment is a multi-purpose tool that can also be used to transport other attachments.

The new Tobroco-Giant Levelling Frame for wheeled loaders is primarily designed to level sand, gravel and earth surfaces, in preparation for tasks such as paving or groundwork.

However, it is also equipped with attachment points that allow it to carry other loader attachments.

Available in widths of between 130 and 250 cm and with a number of hitch options, when the Levelling Frame is mounted on the wheeled loader other attachments can then be stacked onto it compactly, and transported securely on the same trailer at the same time.

"When it comes to the attachments that can be inserted into and stacked on the frame, there is a wide range of options. Whether the pallet forks are standard, with side shift or completely hydraulic, they all fit in the frame," says Tobroco-Giant.

"Regarding the range of buckets that can be placed on top of the levelling frame, the possibilities are endless. Earth buckets, grading buckets, high volume buckets and stone buckets are just a few examples of the attachments that can be supplied."

©TOBROCO-GIANT

attachment features a central lubrication system and replaceable wear parts that help to reduce downtime.

Similarly, screening buckets also enable contractors on smaller sites to meet their project requirements.

Take the newly updated VSE screening buckets from Simex for example, which are designed for separating different-sized materials on-site.

FIT FOR PURPOSE

Simex's VSE range consists of four models for excavators weighing between 8 and 45 tonnes.

Key features include the ability to instantly adjust the output size of material from inside the excavator cab and a new screen tool system inside the bucket called FIT.

The FIT system comprises five independent but interlocking parts that can be easily replaced.

Simex says, "This means 75% less maintenance costs, since it is possible to replace even just one single disc or blade. The system allows multiple configurations depending on the materials to be screened."

These features make the VSE buckets particularly useful for backfilling tasks and helps to reduce waste by increasing the reuse of existing site materials.

"In backfilling operations of underground pipes, especially in the Oil and Gas industry, the instant adjustable output size leads to a numerous benefit in terms of saving of time and money," says the manufacturer.

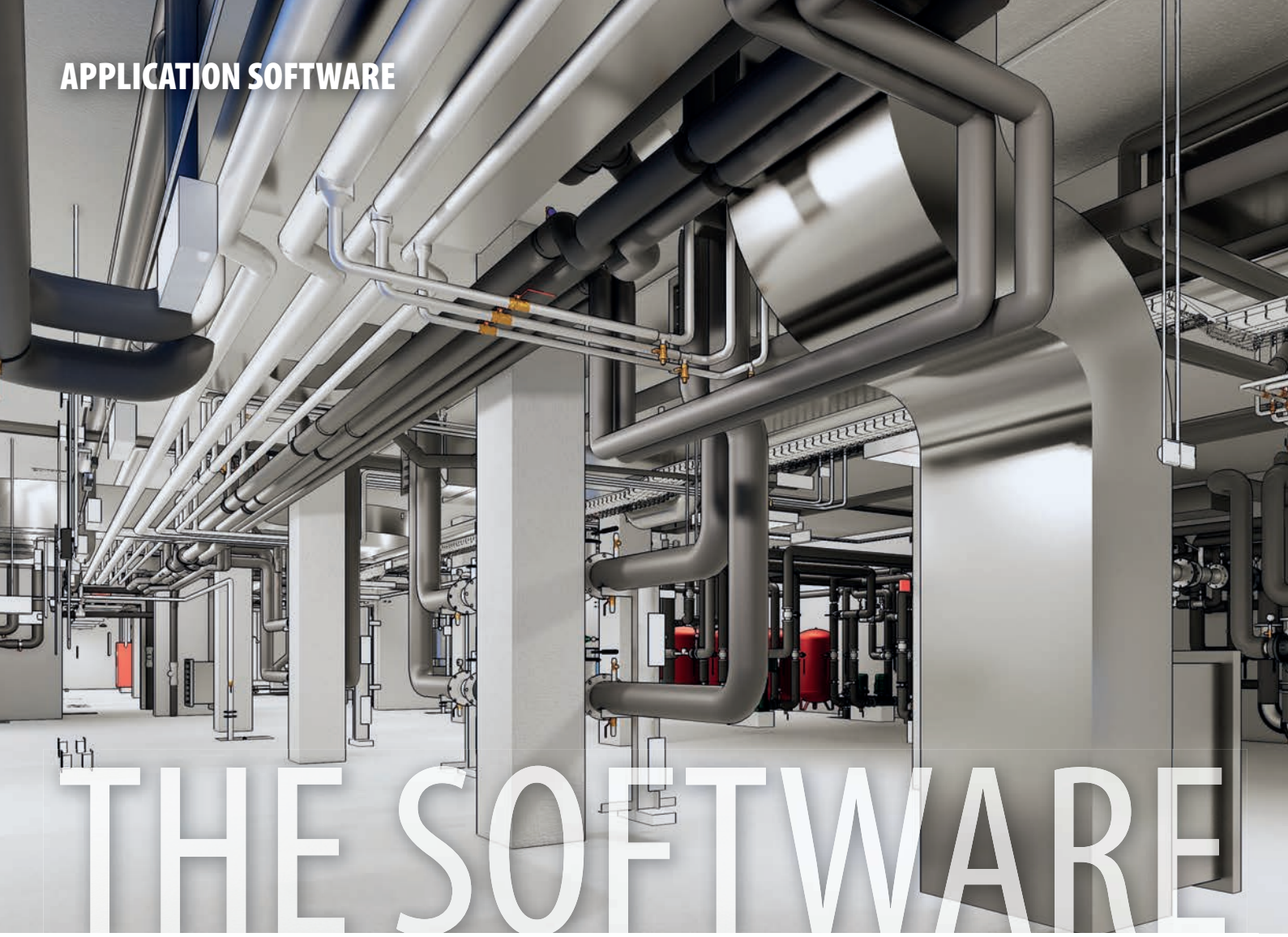
The larger RC 11R model Rockcrusher bucket. PHOTO: ROCK.ZONE

With new attachments continuing to enter the market, promising ever greater improvements to safety, efficiency and versatility of construction equipment, help buyers choose the right equipment, more information can be found on KHL's online equipment directory, Yellow Book. ce

PHOTO: SIMEX

Simex's VSE screening buckets - for excavators of between 8 and 48 tonnes

Rock.Zone's RC 7R Rockcrusher attachment. PHOTO: ROCK.ZONE



THE SOFTWARE DOING THE HARD WORK

Application software may not be the first thing that springs to mind in a discussion about modern construction, but it is playing an increasingly important role in the delivery of Europe's major infrastructure projects, as as MIKE HAYES reports

We have a tendency to label the construction industry as the tortoise in the race to digitalisation. Nevertheless, with so many aspects of the construction process now potentially digitised, it is hard to know where to begin describing them.

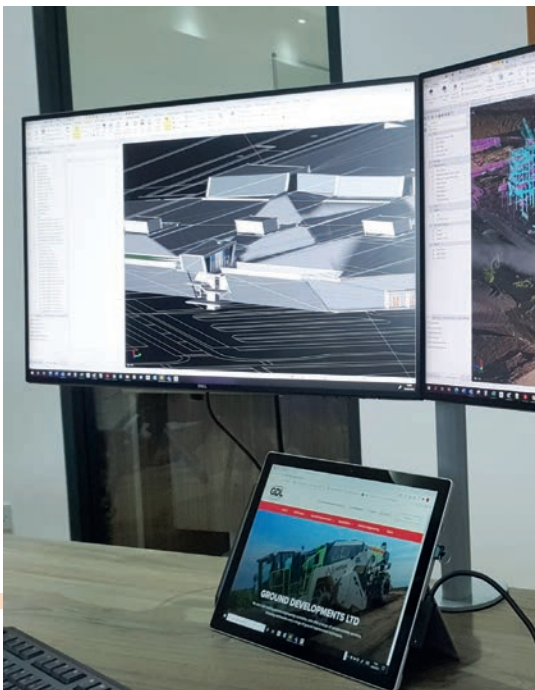
One certainty is that change is coming; this can be seen through the rapid growth of construction technology start-ups and the growing movement of large software companies into the construction arena.

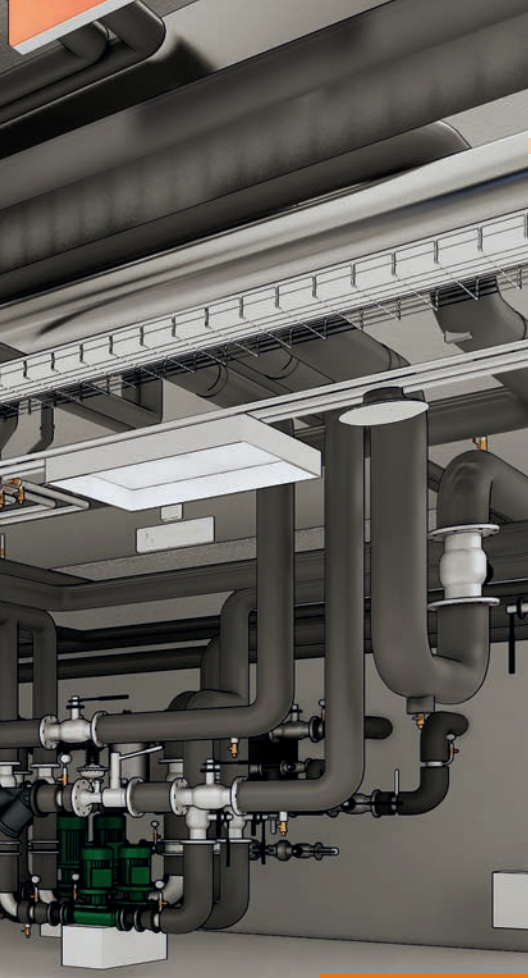
And this is no surprise, given the potential revenue to be made from a mammoth global industry facing significant productivity, efficiency and sustainability challenges.

BIM

Building Information Modelling (BIM) software is often at the centre of construction's digital debate and it's a good bellwether for software's impact on the industry. The global market for BIM software, for example, is expected to be worth around €19 billion by 2025, according to research from industry analyst Cambashi. That's an impressive increase of over €6 billion in five years.

Petra Gartzen, lead analyst at Cambashi, said, "Remote working trends resulting from the global pandemic, as well as government initiatives and regulations, are driving digital transformation in the construction industry.



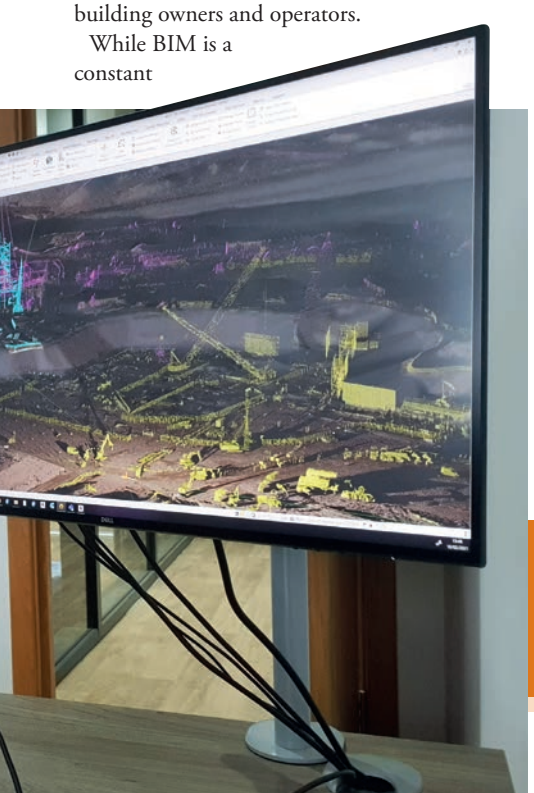


A BIM MODEL OF THE INTERNAL UTILITIES OF A BUILDING
IMAGE: ADOBE IMAGES

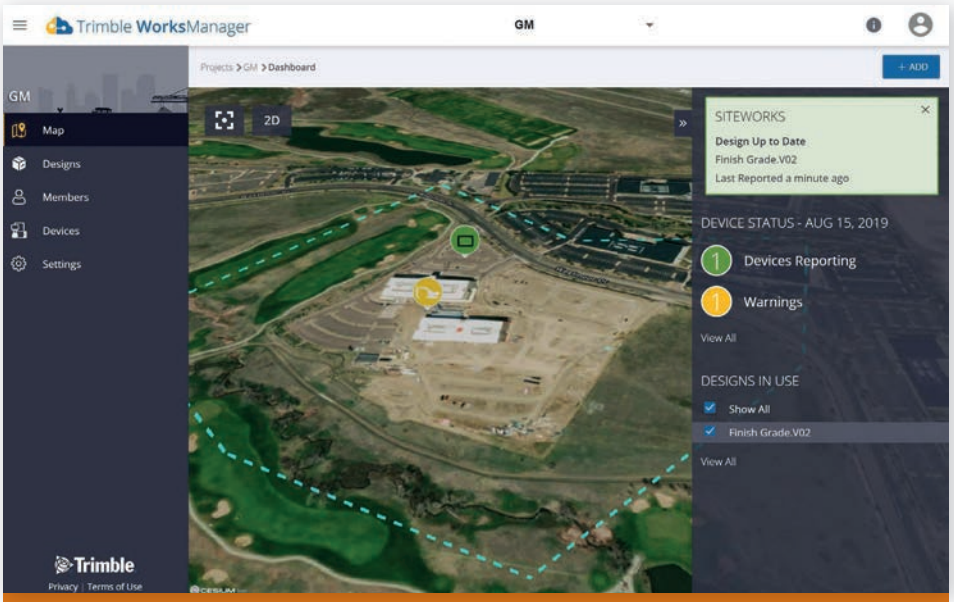
"This in turn is accelerating a growth in demand for BIM software, enabling the construction industry to evolve from the 'Stone Age' to the 'Digital Age'."

According to Cambashi's Employment dataset, around 200 million people currently work in a BIM-related profession, incorporating architecture and design, civil engineering and structural engineering services, as well as building owners and operators.

While BIM is a constant talking point for the industry, it's worth noting that construction software is also playing an increasingly important role in more specialised areas of the industry.



AN EXAMPLE OF GDL'S SET-UP, WITH MONITORS UTILISING TRIMBLE SOFTWARE TO MONITOR SITES
PHOTO: GDL



A SCREENSHOT OF TRIMBLE'S WORKS MANAGER SOFTWARE
IMAGE: TRIMBLE

TECHNOLOGY ON THE GROUND

In the UK, leading ground engineering contractor GDL has been developing its digital technology arsenal for the past decade.

GDL projects director Wayne Barr says it was clear even then that software applications had the potential to immediately improve productivity.

Currently, the company is operating with a suite of Trimble packages, including Earthworks, Works Manager and WorksOS.

Barr says of Trimble Works Manager, "It's a cloud-based software system we use to upload our designs and our files that go onto machines. With a click of a button, we can send a new design to a machine on site.

GDL started using Works Manager in 2020 and Barr says the improvement to operations was seen within weeks, "The immediate data transfer was impressive. The quality assurance was a big part of that, because we knew we were working to the latest design.

"As soon as a new design supersedes an older one, we can upload it to the machine and dump the old. We can view data from the machines on site in real time and if the machines are all green, we know they're using the latest available design;

GDL'S PROJECT DIRECTOR, WAYNE BARR
PHOTO: GDL

if a machine is orange, we can contact the team immediately and check why that machine is using an older design."

Barr says the system means potential issues are caught before they happen.

"We can download data direct from the machines to the office in Works Manager," he says, "and with external engineers using Works Manager on a tablet, they can also send their survey data straight to the office."

Recently, GDL started working with Trimble WorksOS – offering a live recording of data from machines, as well as delivering cut-and-fill data as it happens. This data is then sent to the cloud with volume analysis from the site.

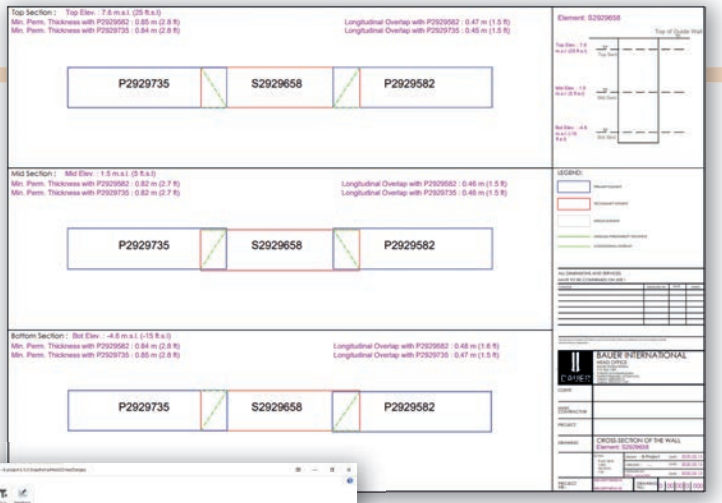
"That's an amazing piece of tech in terms of estimations we can get, with site managers able to see what's happening on their site right now – how much cut, how much fill, if people are working in the wrong areas and what levels machines are at," says Barr.

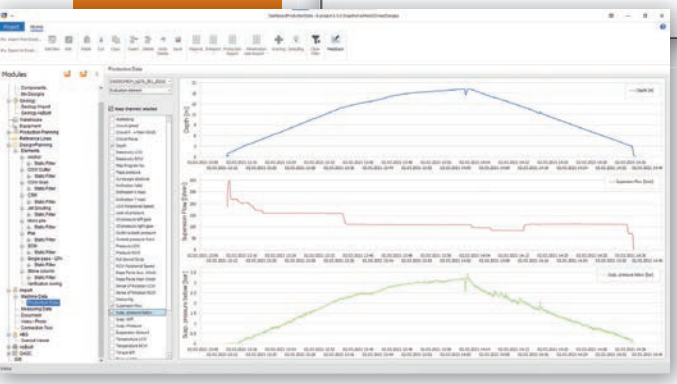
"It's basically total monitoring of a site in real time."

Using the WorksOS software, GDL can make decisions on planning and programming for work coming up in the coming weeks and months and be confident about how much resource is needed on site.

Barr says, "We can accurately forecast when jobs will be finished and demonstrate to site managers whether we do or don't need more equipment to be able to deliver jobs ahead of schedule."

In conclusion, Barr says, "The investment is





BAUER'S B-PROJECT DATA MANAGEMENT SOFTWARE CAN COLLECT, STORE AND PRESENT INFORMATION ON MANY ELEMENTS OF A PROJECT
IMAGES: BAUER

quite a lot, but the return over a year or two is worth it, but only if its being used to its fullest capabilities."

ORGANISED CHAOS

When it comes to major infrastructure projects, there are few who still doubt the potential benefits technology can bring to the construction process.

A large-scale project can involve the coming and going of many thousands of workers and many more pieces of heavy equipment.

Add to this hectic mix potentially millions of tonnes of cement, steel, timber, glass, plastics, etc, and the logistical challenges are undeniable.

Illustrating the need to get on top of this organised chaos, a recent KHL survey saw contractors rank project management software as the number one technology item on their shopping list.

That's ahead of machine control, BIM and alternative power, which, of course, includes the much-discussed electric equipment.

This may seem surprising, although perhaps not when we consider that those same contractors also ranked increased productivity as the number one challenge they face today.

TWINNING A CONSTRUCTION SITE

Bauer is a specialist foundations contractor, known for providing innovative techniques and utilising technology to undertake projects with optimum efficiency.

In 2019, Bauer announced its b-project data management software, which covers various areas of application.

At the beginning of the construction project, design data from the construction office is sent directly into the system.

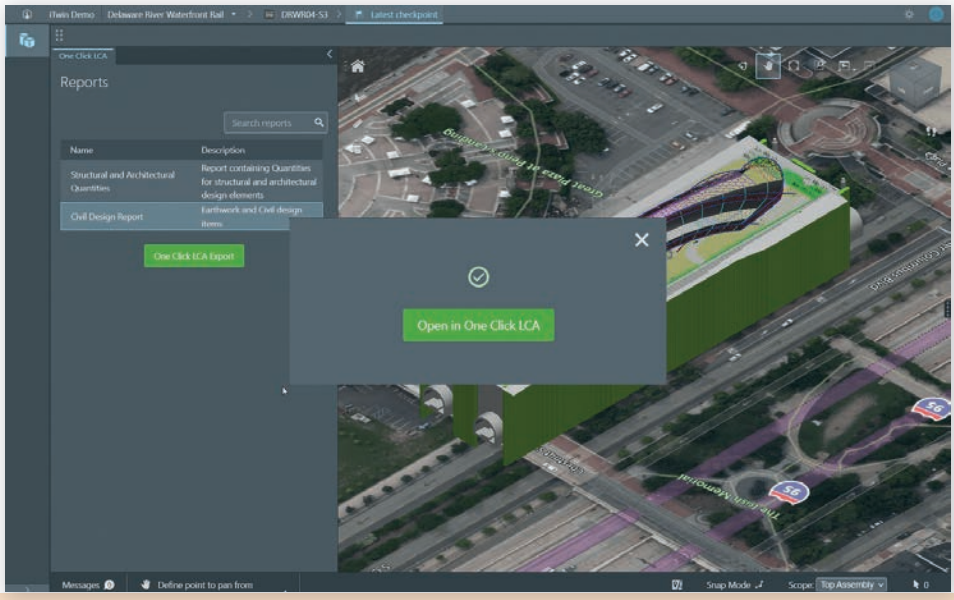
Machine production data, which is generated during the construction works, are then also imported into b-project, to be analysed and visualised to the site manager. In addition, sample lists and technical progress reports are automatically derived from the data. Digital machine data generated by drilling equipment are the basis for the production reports created in b-project.

Bauer says the automated re-entering of the actual production data into the quality documentation and performance reporting forms the central interface of the system.

Using b-project, the company is able to directly link the target data from the planning phase with the actual data from the construction work, for analysis.

Automating this process significantly reduces the documentation and testing effort and supports a standardised, automated and effective site optimisation process for the site.

Furthermore, an overview of the current status of the work can be viewed using the software. By providing analyses for process control, process



BENTLEY SYSTEMS' ITWIN PLATFORM NOW HAS THE CAPABILITY TO CALCULATE THE EMBODIED CARBON OF A CONSTRUCTION PROJECT PHOTO: BENTLEY SYSTEMS

CONSTRUCTION WORK IS ONGOING ON THE LONG-RUNNING HS2 PROJECT PHOTO: HS2

TECH ON TRACK

Construction projects can often be sensitive, from a human, environmental or socio-political perspective.

The bigger and more expensive the project, the more media coverage it will get – and the more it is likely to divide public opinion.

The High Speed Two rail project in the UK (HS2) is just such a project, with its skyrocketing costs and late delivery just two causes for public concern.

After falling foul of the media on numerous occasions, HS2 is turning to software specialists to help it gain trust with the public.

It recently signed a contract with the Access Intelligence Group, a company that will, among other things, provide media and political monitoring software.

The system reportedly aims to monitor news coverage of HS2 and press enquiries, but also offer advice on 'lines to take' in certain circumstances, as well as monitoring stakeholder engagement and the political landscape.

Another deal recently concluded by HS2 will see Brandwatch use its software to monitor the project's social media coverage.

The company says of its services, "Crawling millions of online sources, including all major social networks, [such as] Twitter… news and review sites, blogs and forums, [we] provide owned and earned social media tracking and market research, including image recognition."

optimisation and accounting through b-project, virtually the entire site process can be digitally recorded and visualised.

In short, the b-project data management software creates a digital twin of the works.

Marcus Daubner is Bauer's head of digitalisation, says, "The digital twin reduces the effort for capturing, linking and evaluating different data so that reliable and quick decisions can be made on possible optimisations."

Exciting stuff – and in the next expansion stage, Bauer says it will begin using artificial intelligence to support these decision-making tools.

TWINS FOR SUSTAINABILITY

One of the leading developers of digital twins, Bentley Systems, recently announced a development of its iTwin platform, which now allows for life cycle assessment and embodied carbon calculation capabilities.

To do this, Bentley collaborated with One Click LCA, a developer of construction lifecycle assessment software, which can be used as a tool to decarbonise the entire construction value chain.

Bentley says these tools will be an "essential enabler and accelerator of carbon transparency", which may sound like a mouthful, but could be crucial for European construction firms as the EU moves towards further environmental legislation.

Kaustubh Page, director of product management for the Bentley iTwin platform, says, "Tracking the environmental impact of an infrastructure project involves a constant stream of design changes coming from various engineering disciplines. By unifying these data streams, users can quickly create a quantity takeoff report at the right aggregation level required for LCA [life cycle assessment] calculations, while reducing the lifecycle assessment workflow from weeks to hours. We are excited to see engineering firms build fully automated lifecycle assessment workflows for their infrastructure projects."

Kelvin Saldanha, an associate at the engineering multinational WSP, said, "iTwin has quickly become an indispensable platform on some of our largest projects. It has made our federated models even more accessible and has brought a new simplicity to multidisciplinary coordination, making for more robust design reviews, conflict detection, and issue resolution."

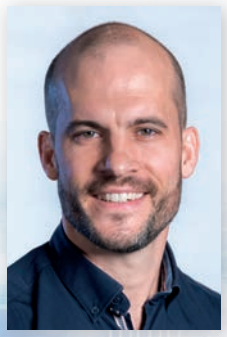
Saldanha went so far as to call the Bentley-One Click collaboration a 'game-changer' in terms of its ability to aid its carbon calculations.

SOURCE OF TRUTH

No conversation about software or digital technology more generally can be complete without mentioning the issues of compatibility.

Having technology solutions from different providers can be problematic if those solutions fail to connect with each other in a meaningful way.

Jacobs is an engineering group with a formidable track record in the use and analysis of digital processes in construction.



ANTON TURRELL, DIRECTOR OF TRANSFORMATION WITH JACOBS PHOTO: JACOBS

Anton Turrell, director of transformation with Jacobs' Major Projects & Programmes Group, told CE, "At Jacobs, we're using machine learning to integrate systems and leverage predictive analytics to empower better future decisions.

Capital projects and programmes are becoming increasingly complex, meaning greater challenges in assessing true progress status. This challenge includes schedule, cost and risk updates because of the many variables and supply partners.

"Machine learning can process data from previous projects and transform it into prediction models using pattern recognition. One of the leading AI-powered construction simulation and optimisation platforms is already cutting costs by 11% and build time by 17% on average."

Turrell went on to say, "Siloed data and incompatible software will impact progress on any programme. Importing data from different sources and collating insights takes up significant time and resources, as well as opening up opportunities for human error.

"By combining project management workflows into our central cloud-based platform, data can be united from disparate systems. This creates one unified source of truth, a line of sight that's shared in real-time. It closes communication gaps and offers improved data analysis." CT

COMBINING WORKFLOWS INTO A CENTRAL CLOUD-BASED PLATFORM CAN CREATE ONE UNIFIED SOURCE OF TRUTH, SAYS JACOBS' ANTON TURRELL. PHOTO: ADOBE IMAGES

LEICA'S MC1 SOFTWARE, DISPLAYING ON AN MCP80 TABLET PHOTO: LEICA

LEICA'S MACHINE CONTROL SOFTWARE

Leica has launched a new software platform that it says can be used in conjunction with all machine control solutions.

The MC1 platform, says Leica, is able to guide and automate all heavy construction machines.

The machine control software assists the machine operator by comparing the design model to the actual position of the machine's bucket, blade, etc, then automatically controlling the position of the machine's cutting edge for increased efficiency.

The MC1 software can be loaded onto Leica's MCP80 panel and MDS Series docking station, allowing interchangeability between machines.

Completing the line-up, the MC1 platform is supported by the cloud-based Leica ConX collaboration platform, which allows for the managing and share job-related data with all stakeholders on a project.

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ELECTRIC AVENUES

What role are major cities playing in the switch to electric or low-emission construction equipment? Lucy Barnard looks for answers

PHOTO: ALISTER DOYLE, REUTERS

Workers put finishing touches to a novel 'zero-emissions' building site in central Oslo, November 2020

When construction work started at Olav V Street in the centre of Norwegian capital Oslo, the noise and fumes created by excavators converting a taxi rank into a pedestrianised zone was so low that café owners even left their doors open.

So says Guro Wensaas, social responsibility advisor at Oslo Municipality, the city government responsible for attempting to undertake the world's first zero emissions construction project.

Work began on site in one of the busiest streets in the city in September 2019 and completed in November 2020, using nearly all electrical machinery.

"The pilot project in Olav Vs gate has produced valuable experience for future projects, both for contractors, grid companies, municipalities and machine suppliers," says Marianne Mølmen, Project Manager for zero-emission construction sites.

"The City of Oslo has willingly accepted its responsibility for bringing about the necessary changes in the emission levels from the building and construction industry, so that we can enjoy a greener city."

Much of the work was completed using a ZE85 9-tonne battery-powered tracked excavator and a ZE160LC excavator, developed by Hitachi in cooperation with Norwegian dealer Nasta and the German company EAC European Application Centre. Other electric machines used included a Kramer 5055e wheel loader and a Caterpillar 323F Z-line excavator (developed by Pon).

According to Mølmen, overall the electric machines performed equivalently to diesel ones but some processes still required traditional machinery such as welding in order to ensure the same quality.

Now, as a result of the success of the project, Oslo Municipality is aiming to require all contractors undertaking construction work on its behalf to use emissions-free equipment.

TOWARDS ZERO-EMISSIONS CONSTRUCTION SITES

The city is one of a small but growing number aiming to cut emissions from construction sites to zero over the coming decade through a combination of demonstrating best practices, public procurement incentives and changes to construction permit rules. (See box at bottom for list of case studies.)

According to the United Nations, 23% of the world's CO_2 emissions come from construction and 5.5% of that come from machinery and equipment on construction sites.

Over the last 20 years, many cities, especially those in Europe have introduced Low Emissions Zones (LEZ) regulating the number and type of diesel and petrol cars which can access city centres. However, most LEZs still do not include construction machinery and other off-road vehicles.

"As cities become increasingly aware of air pollution impacts and turn to 'Low Emission Zones' and alternatives, construction machinery has remained relatively unregulated," says Mark Preston Aragonès, policy advisor at Norway-based non-profit organisation, The Bellona Foundation.

"Construction machines are frequently omitted from Low Emission Zones, which regulate the access and operation of vehicles within designated areas."

Wensaas and Mølmen say that instead of restricting fossil fuel burning construction equipment through the city's congestion charge or Low Emissions Zone, Oslo city council is hoping to use planning permits to completely ban emissions from construction sites by 2030.

Moreover, as a major purchaser of construction services for roads, schools, nursing homes and wastewater infrastructure, with a construction budget of NOK10bn (€1bn) a year, Oslo will use its purchasing power to require publicly procured construction projects to use zero emissions machinery and transport by 2025.

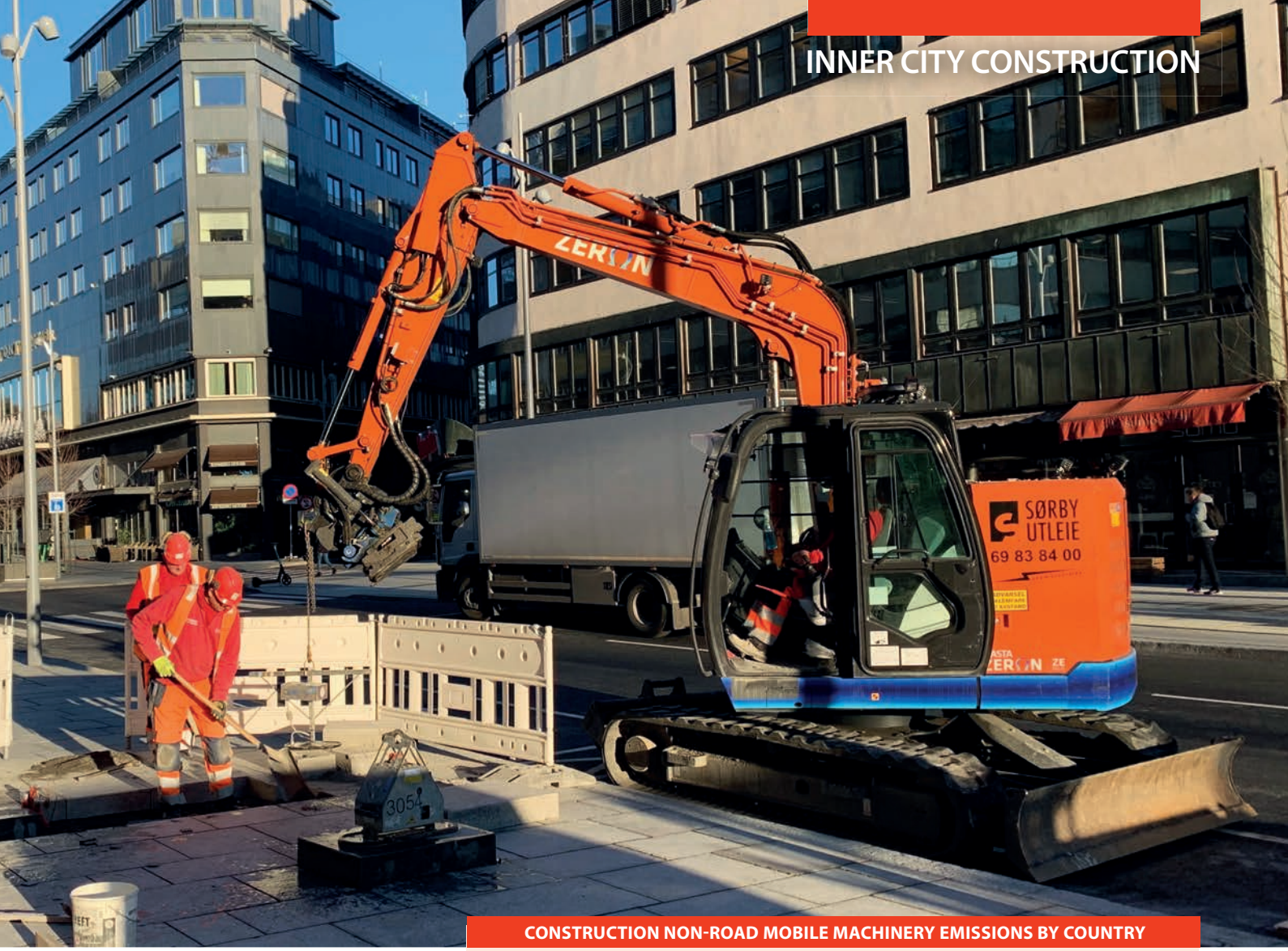
In 2019, the city even updated its procurement policies requiring projects worth NOK50m (€5m) to use zero emission heating and drying equipment, which is mainly used for curing concrete. And for projects worth NOK5m and above, contractors which specify the use of zero emissions machinery and/or heavy duty vehicles get preferred treatment.

As a result, Oslo estimates that around 15% of the new excavators sold in the city this year will be electric.

THE BIG BUYERS INITIATIVE FOR SUSTAINABLE CONSTRUCTION

Oslo is also one of a handful of cities in the Big Buyers Initiative working group on zero emissions construction sites – "Zemcons" for

The zero local emissions ZE160LC excavator in Oslo, developed by Hitachi and Nasta



short. Cities which sign up for the project, run by ICLEI (Local Governments for Sustainability) and Eurocities, have committed to use their buying power through public procurement contracts to drive innovation.

"Using their vast purchasing power, cities can create a new market and push manufacturers, contractors and suppliers to adopt new technologies and methods to enable the construction industry to continue its vital work without damaging our environments," says Preston Aragonès.

The working group is primarily led by Oslo, Copenhagen, Helsinki and Stockholm, all of which are in various stages of piloting zero emissions construction sites. However, other European cities are watching closely, including Amsterdam, Brussels, Budapest, Lisbon, Nantes and Trondheim.

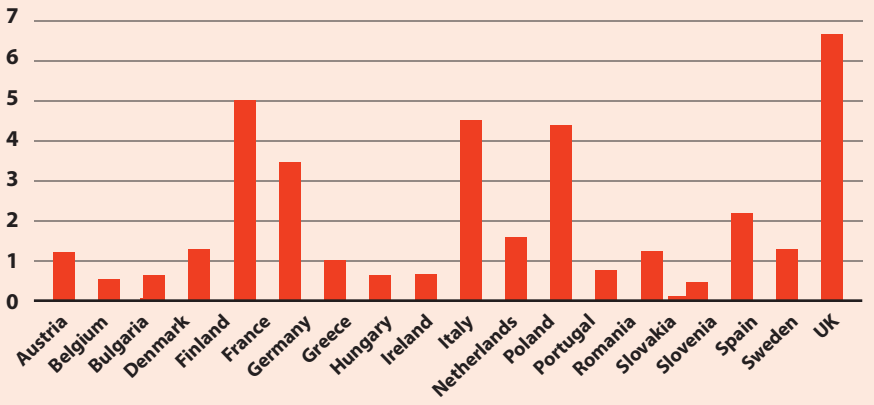
In 2020, Denmark-based contractor Nordkysten started work on Copenhagen's first zero emissions construction site, laying cables under the city's pedestrianised Østergarde area.

The contractor used equipment including Wacker Neuson's 1.5 t EZ17e excavator, a 1.5 t payload electric DW15e wheel dumper, a battery-powered vibratory plate AP1850e, and a battery-powered rammer AS50e, rented from Denmark's largest rental company, GSV.

"When we work a lot in night-time, we have to use machines with very low noise," says Frank Schou Kruse, MD of Nordkysten. "The machines are impressing us a lot."

CONSTRUCTION NON-ROAD MOBILE MACHINERY EMISSIONS BY COUNTRY

Source: UN Framework Convention on Climate Change



And in 2021, Finnish capital Helsinki completed its first major public project using electric construction equipment, converting Kulosaaren puistotie boulevard in the Kulosaari district, into a cycling street.

The construction work, which was undertaken by Finnish contractor VM Suomalainen Oy, used three 4.2 t electric wheel-excavators and one electric mini-excavator. However, the rest of the machinery used on site was diesel-powered, with most of these machines fuelled with HVO (hydrotreated vegetable oil).

The city's Urban Environment Division said that it had decided not to demand full use of electric machinery on the site because it wanted to let small companies which could not afford electric machinery to participate in the tendering whilst still encouraging the use of electric machinery.

HELSINKI AIMS TO BE FOSSIL FUEL FREE BY 2025

As a result of the project, the council said it has decided to apply the minimum criteria for this procurement for all future outsourced infrastructure and street infrastructure projects. It plans to make all city construction sites fossil fuel free by 2025 and zero emissions by 2030.

"With the Green Deal signed in September 2020, the practices of zero-emission worksites will be gradually applied to the work of the entire city," the Urban Environment Division said in a statement. "Next we will expand the pilots to housing construction and

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INNER CITY CONSTRUCTION

Shell's first EV charging station in London, UK

PHOTO: SHELL, COPYRIGHT, ED ROBINSON

CITY	MEASURES
Oslo, Norway	Oslo Municipality already requires contractors bidding for municipal tenders to be fossil fuel free. Oslo's Climate Strategy says that from 2025 the municipality's owns sites will be emissions free. It plans to use planning permits to completely ban emissions and diesel vehicles from construction sites from 2030 onwards.
Helsinki, Finland	The Finish government hopes to achieve 100% fossil fuel free construction sites by 2025 through a voluntary agreement with 20% emissions free. By 2030, the government wants all sites to be electric, hydrogen or biogas.
London, UK	London's NRMM Low Emissions Zone requires all engines with a power rating between 37kw and 560kw to meet an emissions standard based on the engine EU emissions 'stage'. The city has a target of zero emissions construction sites by 2040.
Copenhagen, Denmark	Copenhagen has already piloted a zero emissions construction site in the city centre. The city's climate plan says it is prepared to implement procurement strategies focused on the construction sector.
Amsterdam, Netherlands	Amsterdam is planning on setting low-emission criteria in tenders with the aim of eliminating emissions from mobile machinery by 2025. The city is also investigating banning diesel generators in certain areas.
Stockholm, Sweden	Stockholm's target is for the construction sector to be fossil-free by 2040. Since 1999, contractors bidding for public contracts must ensure engines meet specific emissions standards or be retrofitted.

maintenance projects."

On the other side of Europe, London too has announced it plans to bring construction site emissions down to zero, but only by 2040.

However, unlike Oslo, Copenhagen and Helsinki, the London Mayor is hoping to achieve the switch by introducing its own Low Emissions Zone for non-road mobile machinery which it is putting into practice through the use of planning conditions and enforcing through site inspections.

The NRMM (Non-road Mobile machinery) Low Emissions Zone requires all operators to register and for all equipment used in the areas in which it operates to meet specific EU emissions standards.

And the Mayor's office says that it is waiting for legislation from the UK government in order to do more.

"The Mayor has consistently lobbied for Government to create more efficient powers to control emissions from all NRMM in London," a spokesman from the Mayor's press office told *Construction Europe*.

"Despite the commitment made in the 2019 Clean Air Strategy Government has yet to bring forward regulations to help local authorities control emissions from this source."

OEMs say construction and rental firms – and their clients – are also requesting emissions-free construction equipment in order to enhance their 'green' credentials.

In February 2021, for example, Austrian contractor Swietelsky used a Wacker Neuson electric mini excavator and battery powered rammer to complete outdoor facilities at a mixed use development in central Vienna.

"We would like to reduce CO_2 emissions as well as noise pollution step by step, particularly in the inner city area," says Karl Weidlinger, CEO of Swietelsky. "We can reduce operating costs with [these machines] and protect the operators even better."

In France, civil engineering firm Colas said it was trialling a fully electric excavator at its Stonleigh Junction site in Warwickshire, UK.

Energy giant Shell, which is currently in the midst of a major construction effort to install 500,000 EV (electric vehicle) charging points across its sites - up from the current 80,000 points - says that it too hopes to run a trial of EV excavators in 2022.

TRANSITION MOVING SLOWLY

Yet critics still complain that globally the transition to zero-emissions construction equipment is still moving too slowly.

Contractors and rental companies point out that prices for electric equipment is often prohibitively expensive.

Volvo CE, one of the world's major construction equipment OEMs and a leader in electric machines, estimates that the average price of an electric mini excavator stands at around €63,600 (£53,000) while its diesel equivalent is just €25,200 (£21,000).

Without sufficient charging infrastructure, contractors fear that they would not be able to get enough power to do the work required. And, with electric construction vehicles still in their infancy, many fear that the equipment is not as powerful as its diesel equivalent.

"The shift to electrification is a chicken-and-egg scenario. If sales volumes of electric machines don't rise, then the prices will struggle to fall," says Mats Bredborg, head of customer cluster utility at Volvo CE.

"The leaders of major urban centers are sold on the idea of cleaner inner-city construction, but it needs the entire supply chain – legislators, clients, contractors, equipment manufacturers – to make it a reality. At Volvo CE we are investing heavily in electrification, but the industry is resistant to updating entrenched construction methods." ce

London has a target of reducing emissions from construction sites to zero by 2040

PHOTO: ADOBE IMAGES

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PIACENZAEXPO

A VISION FOR NET-ZERO BUILDINGS

Zsolt Toth **of the Building Performance Institute of Europe discusses the need to measure the whole-life carbon emissions of the built environment**

The window of opportunity for significantly mitigating the effects of climate change is closing fast.

While the European Commission (EC) is implementing important legislation, with the aim of lowering the carbon emissions of the built environment, the wheels of politics – at least within democracies – tend to turn slowly.

The Building Performance Institute of Europe (BPIE) is an independent think tank, based in Brussels, established to help the bloc's policy makers design and implement more sustainable building regulations.

Initially focused on the energy performance of buildings, the group's scope has increased to include the whole-life carbon in buildings.

For Europe to achieve carbon-neutrality, emissions must be drastically cut throughout the whole lifecycle of buildings, encompassing all operational and embodied emissions – including those that arise from the construction process.

The EC's recent proposals, which define a 'zero-emission building', also call for the mandatory disclosure of the lifecycle global warming potential of large buildings by 2030.

In the wake of these proposals, the BPIE has released its own 'roadmap' – outlining policies that could tackle the lifecycle emissions of buildings, including those resulting from the production, installation, maintenance and disposal of building materials.

BEYOND ENERGY PERFORMANCE

One of the lead authors of the BPIE roadmap, Zsolt Toth, spoke to CE about the report and his hopes for its adoption.

"We've been concentrating on energy efficiency, energy performance; it's a big part of our work, a key issue of the past 10 years.

"Now we're witnessing an expansion of the scope of building-related policies, to go beyond energy performance and towards lifecycle environmental impacts, carbon footprint and so on.

"We're seeing mostly Western and Nordic countries moving away from energy efficiency as the sole metric, to regulating carbon across the lifecycle [of buildings]."

Toth explains that the regulatory focus within the EU has been largely on energy performance, with the whole-life carbon impact of buildings something of a blind spot, in terms of the EU policy framework.

"We've realised this is not enough," he says, "certainly in the case of new construction.

"For most of the buildings erected today – and the same goes for infrastructure projects, to a large extent – at least half of their carbon footprint is due to these embodied, these 'hidden' emissions. By the time the building is handed over for use and operation, a lot of greenhouse gases are already in the air – coming from the materials, coming from the construction processes themselves.

"Going forward, the ratio of embodied versus operational emissions is going to change significantly, so more and more emissions will come from embodied sources,

BPIE's report is a roadmap for reducing carbon emissions in the built environment IMAGE: BPIE

because operational requirements will be very tight and possibly get very close to net zero."

NO SIMPLE ANSWERS

From here, the next obvious question is why are we not already regulating the whole-life carbon emissions related to buildings and construction?

Toth says, "Embodied emissions are clearly much more difficult to measure than operational emissions.

"It's not as though you can install a metre when you start construction work, then read the metre to get the carbon footprint of the building. You have to rely a lot on data provided by the designers, the product manufacturers. Today, I think it's fair to say there's quite a lot of uncertainty around this. You have to make some assumptions and work with scenarios and you will never have a precise amount for the carbon budget for a project or for a building."

These do seem like monumental challenges, but Toth insists, "This should not stop us from taking action – there is clearly a question of how much data we need to start effectively regulating against this and checking compliance. That's the argument we try to make in our report."

There is a sense of urgency, both in the roadmap report from BPIE and also in the tone adopted by Toth, who says of the current EC proposals, "We are aware the next review is not for five years. We are going to miss the 2050 carbon neutrality target if we don't take action now.

"I appreciate there are uncertainties to 2050, but I think it's important to provide that long-term vision, for the market to prepare for this, and if certain things cannot be introduced in the current recast, it's very important that the trajectory is already being set.

"Climate mitigation is very much time dependent. If we don't address all sorts of carbon emissions today – or over the next five to 10 years – it will make no sense if we have very efficient buildings in 2050, because we will have already missed our target.

"We think the roadmap provides quite a compelling reason why the policy makers should consider lifecycle emissions."

Given the technical, logistical and political challenges surrounding the measurement of whole-life carbon data from the construction industry, it is unlikely that there will be any EU-wide directives on this for some time.

So where do we go from here?

Toth says, "Clearly, more collaboration will be required, but setting a carbon budget for a building project or an infrastructure project sets out clear responsibility and accountability across the various construction and building sector value chains, starting from the commissioning, the design, the product manufacturers, the building use and ending with the decommissioning, reuse, etc.

"You need to have an accounting trail. You need to have not just clear responsibilities of what went into the building, and how certain things have been realised."

THE ROLE OF DATA

As the construction industry edges towards its digital transformation, one wonders how big a part technology will play in aiding the net-zero challenge.

Toth says, "The issue is not really about a lack of data, it's more the data accessibility and data storage. Accounting for and managing and mitigating for whole-life emissions is a data-intensive undertaking. That means this data will have to be stored in a way that is accessible for various stakeholders."

Nevertheless, he insists there is an opportunity here to capture relevant data that can be used to optimise the carbon footprint of buildings.

He adds that "One of the main barriers we struggle with when it comes to the sustainability performance of the sector is that it's not really transparent."

If it were, though, he says, and if common protocols could be put in place for the measurement of embodied carbon levels, things could progress.

He adds, "If financial regulators will reward this sort of ESG [environmental Social Governance] behaviour by providing preferential treatment for banks who, say, have a green portfolio, that could come with certain financial advantages.

"So, for developers, or building or real estate owners, the message is very simple: green assets are likely to get easier finance or a lower interest rate or preferential financing conditions."

Asked directly whether he believes the goals set out by the Paris Agreement are still achievable, Toth says, "The window of opportunity is closing. The message is very simple: the urgency of action is there." ce

For more information about BPIE and its net-zero roadmap, visit www.bpie.eu

> "Climate mitigation is time dependent – it will make no sense if we have very efficient buildings in 2050, because we will have already missed our target."
>
> **ZSOLT TOTH, co-author on the BPIE roadmap report**

AI A MORE INTELLIGENT WAY TO BUILD

Oracle Construction and Engineering's data strategist Karthik Venkatasubramanian **on why artificial intelligence has the potential to revolutionise the construction industry**

The construction industry has historically been slow on the uptake of new technologies, with the benefits often overshadowed in favour of hands-on experience and expertise.

However, when project teams are operating complex and disjointed systems, processes can quickly become fragmented with operations being executed in siloed systems.

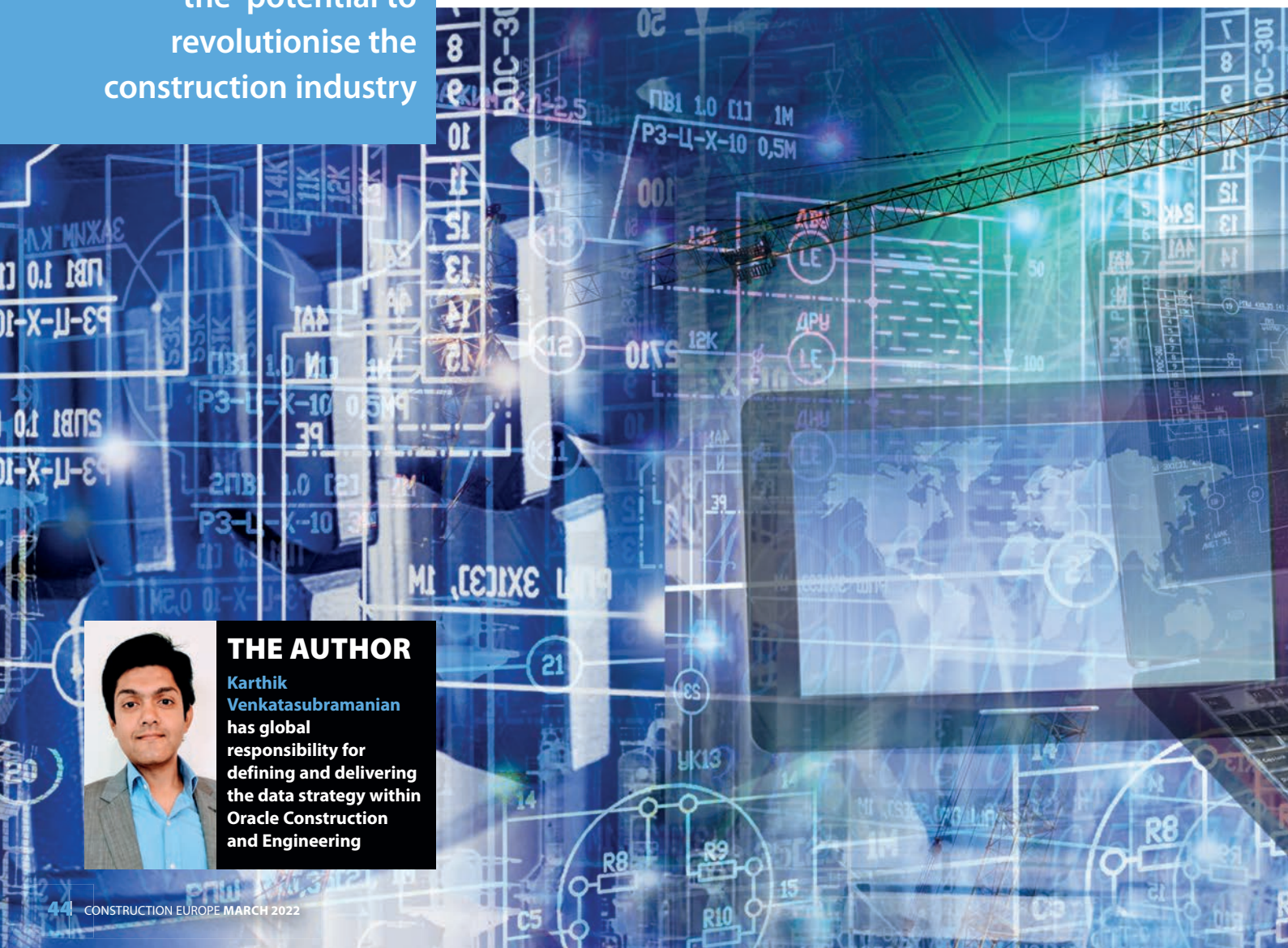
For a technology to truly become invaluable, driving trust and collaboration between members of project teams, the industry must collectively embrace intelligent construction platforms.

Since the onset of the pandemic, the industry is experiencing a new wave of digitisation, enabling organisations to creatively use new technologies to solve traditional problems.

Right now, investment in construction technologies is at an all-time high, but it's only been more recently that the focus has shifted to artificial intelligence (AI).

THE POWER OF AI

As digitisation continues to be embraced by the construction industry, the vast amounts of data generated provides teams with a



THE AUTHOR

Karthik Venkatasubramanian has global responsibility for defining and delivering the data strategy within Oracle Construction and Engineering

significant opportunity to learn from and use information to create better estimates, plan the project schedule smarter, and help avoid – or at least mitigate – potential risks.

The basic ingredient for AI to work is data and a lot of computing power, which in turn identify patterns in the data and produce insights.

With the advent of the cloud and ever-increasing computing capabilities now within the reach of most companies, the use of AI can become a reality in the construction field.

AI acts as a force multiplier from investment in digital initiatives.

When business processes are digitised, there are often immediate productivity gains.

The data these systems generate can help produce valuable descriptive analytics that can aid decision making in the field.

It can help determine what actions need to be completed today, who or what is holding up a certain process, whether the schedule is on time and the current state of the budget.

With AI, it takes these insights a step further by powering predictive analytics. The ability to gain insights from historical and real-time data, and applying them to current projects, is key to providing a basis to prevent mistakes from being repeated and ensure there is a focus on driving continuous improvements.

AI therefore shifts the focus from lag indicators to lead indicators. Most of the current reports and dashboards are being used to focus on "what has happened" or "what is happening" on projects, typically after an event or task has occurred.

With AI, there is a huge opportunity to take proactive take action on "what might happen?"

AI can be used to analyse project schedules and identify activities that are at risk of being delayed.

AI can also be used to detect risks of disputes, change events or variations. This can be a total game-changer when done right, as it has the potential to help deliver projects ahead of time, improve profit margins, and reduce risks significantly.

HOW AI CAN IMPROVE CONSTRUCTION AS WE KNOW IT

Over the next few years, the industry is set to face massive disruptions stemming from the labour and supply chain shortages that have recently disrupted the industry. These issues are not going away anytime soon.

AI holds enormous potential to help engineering and construction organisations by empowering project team members with a decision-making solution that is rooted in historical performance, state-of-the-art machine learning and data.

AI can act like an additional team member that is constantly monitoring the project landscape for early signs of risks and surfaces them before they become an issue. These could range from risks found on a job site, including added costs, compliance violations, litigation, or health and safety issues.

As a result of the continued adoption of technology and consequent creation of data, new intelligent technology platforms, powered by an AI and machine learning (ML) "data backbone", can help organisations better utilise their data and convert it into the intelligence needed to accelerate performance by acquiring new capabilities, previously not feasible or not possible to implement in a cost-effective manner.

AI technologies enable organisations to regularly monitor developments and adjust plans using up-to-date predictive insights, essentially helping them succeed in the present, and learn from the past to improve the future.

AI VS THE TRADITIONAL APPROACH

With a projected annual growth rate of 5.71% over the next three years, the construction industry is under pressure to keep up with demand. Every aspect of project delivery now requires an overhaul and is ripe for disruption.

AI-powered systems can compute massive volumes of data that traditional approaches have not been able to previously. They can do this at a fraction of the time and a fraction of the cost than that was required previously.

This is especially true for processing and mining unstructured data such as photos, videos, and text and converting them to insights and intelligence.

This can range from using Natural Language Processing to mine text data for early warnings, using anomaly detection to detect unexpected data points and using computer vision to track progress, detect issues missed by inspectors, for tracking material delivery and labour movement on-site.

The possibilities are endless with this type of technology and we are only beginning to scratch the surface.

AI is also self-learning, where the system evolves as it learns from feedback provided by the user. Traditional systems require manual human interaction to update and apply new rules or logic. AI systems constantly improve their algorithms based on both user-feedback and re-train on new data that becomes available.

Furthermore, there is complete transparency about their accuracy as most systems show accuracy and precision scores. The accuracy of these systems gets better over time as the system continues to learn.

Also, since AI uses probabilities to estimate and forecast what is likely to happen, it allows organisations to prepare for different scenarios that might arise and mitigate potential challenges before they arise.

While a lot that can be learned from the past, the ability to predict the future and help organisations make the decisions needed to change the course of a project before it's too late is the real benefit of AI. ce

EARTHMOVING

Case showcases electric mini excavator

Italian manufacturer offers a first glimpse of its new electric model

PHOTO: CASE CONSTRUCTION EQUIPMENT

Case's CX15 EV electric mini excavator, destined for the European market next year

Italy-based Case Construction Equipment has provided the first glimpse of an expanded mini excavator offering at the CNH Industrial Capital Markets Day event in Florida, US.

The showcase included the debut of the Case CX15 EV (electric vehicle), scheduled for the European market in 2023.

The CX15 EV is a 1.3 t mini excavator powered by a 16kW electric motor.

It features retractable tracks that reduce machine width to 790 mm (31 in) for going through doors and working in confined spaces. According to Case it can also work very close to structures and obstacles with a minimum swing radius design.

The 21.5 kWh lithium-ion battery is charged either by the 110V/220V on-board charger, or via an external charger that can have the machine charged typically within 90 minutes.

Depending on the type of work, Case says the CX15 EV will provide enough power for an eight-hour working day.

"From reduced emissions to noise reduction and lower lifetime fuel and maintenance costs, the Case CX15 EV will be a powerful, efficient and sustainable addition to our mini excavator line up," said Egidio Galano, head of construction equipment product management – Europe.

"This machine is the next step in our electrification journey – and we are committed to bringing the industry a complementary portfolio of diesel and electric equipment to meet the needs of the broadest range of applications and operations." ce

ATTACHMENTS

Cat's new smart attachment for loaders

PHOTO: CAT

Smart creep will be available in the third quarter of 2022

Caterpillar is to launch a new 'smart creep' feature for Cat D3 Skid Steer Loaders (SSL) and Compact Track Loaders (CTL) for operating cold planer and wheel saw attachments.

The feature combines attachment sensors and software to balance attachment load and machine speed.

"Smart creep senses the load on the attachment and automatically adjusts the drive command to keep the cold planer or wheel saw running at the most productive speed," the OEM confirmed in a statement.

"By continually sensing the load on the attachment, smart creep increases machine speed when encountering less resistance and automatically slows the machine when encountering higher load. Engine load remains constant, while the operator can monitor hydraulic pressure on the in-cab display panel."

"Without the aid of this feature, setting creep speed too fast can lead to stalling the attachment, and too slow of speed results in productivity loss. Smart creep software smoothly and efficiently determines the optimal machine speed for cutting conditions."

To use the feature, the operator activates the standard creep control system and sets the maximum creep speed on a display inside the cab. Once the tool engages the cut, smart creep measures load on the attachment and adjusts the drive command automatically as cutting begins.

In the event of the cutter jamming or stalling, an auto reverse feature within smart creep quickly changes machine direction to allow the tool to clear the jam.

Smart creep on Cat D3 SSL and CTL machines will be available in the third quarter of 2022. A field installation kit consisting of sensors and machine software for operating the new feature will be made available for existing fleet loaders and attachments.

Once commercially available, new cold planer and wheel saw purchases will be shipped from the factory with the required hardware installed, and new D3 SSL and CTL models will come smart creep ready from the factory. ce

CRUSHING & SCREENING

New Nordtrack crusher from Metso

Metso Outotec has added the 1011 mobile impact crusher to its Nordtrack range of mobile crushing and screening equipment.

The Finnish manufacturer and aggregates and mining specialist says it is targeting smaller applications in the construction and demolition waste recycling segment with the new machine.

The 1011 crusher can be transported on a standard trailer and, according to Metso, is compact enough to allow for easy movement within jobsites. Blow bar options are also available.

Vesa Tuloisela, who heads the Nordtrack product offering at Metso Outotec, said, "The launch of Nordtrack I908S was very successful, and consequently we have been asked for a bigger mobile impactor unit.

"The I1011 has a more powerful crusher and engine, resulting in a capacity as high as 300 tph. As a mobile crusher it also is well suited for the recycling of demolition and concrete waste, or reclaimed asphalt."

EARTHMOVING

Huddig backhoes get redesigned 'from scratch'

New diesel-powered 1370 and hybrid 1370T feature new engine technology and hybrid option

Sweden's Huddig has launched two new backhoe loaders for European and North American markets.

The diesel-powered Huddig 1370 and the hybrid Huddig 1370T are the first of a new generation of machines.

"Redesigned almost from scratch", the models are available in City, Cable and Rail versions to suit urban, industrial and railway applications.

Lars Lindahl, CEO of Huddig AB, said, "We are now entering a whole new era. From now on, customers will choose between diesel and hybrid power in every segment.

"For us, it is natural to shoulder our responsibility in the green transition. This also means new opportunities for the entire industry, given the emerging focus on sustainability."

The diesel-powered 1370 has a Stage V six-cylinder Cummins engine and can run on HVO (hydrotreated vegetable oil) fuel, and its 1370T sister machine incorporates Huddig's Tigon hybrid technology.

The 1370T has a Cummins four-cylinder diesel engine alongside an electric drive and a 44kWh battery, which means the model produces both low levels of noise and low emissions.

The hybrid 1370T can be charged overnight from a mains source or via a plug-in-option for stationary work and charging. It can operate for up to 2 hours or travel for 20km on battery power alone. ce

PHOTO: HUDDIG

Huddig's 1370 and hybrid 1370T backhoe loaders

CRUSHING & SCREENING

Kleemann introduces new jaw crusher to its mobile range

Germany-based crushing and screening specialist Kleemann – part of the Wirtgen Group – has announced the launch of its latest mobile jaw crusher – the Mobicat MC 110(i) Evo2.

The company says the new machine is designed with construction and demolition applications in mind and has a medium- to upper-range hourly output of up to 400t/h.

Kleemann says the new machine boasts a number of innovative technologies, optimising energy efficiency and sustainability.

These include an improved diesel-direct drive system, with an output-dependent fan that promises an increased cooling capacity and operates only when required.

A continuous feed system also provides continuous crusher utilisation, which Kleemann says can lead to an increase of up to 10% in daily outputs.

An extra-long articulated crusher jaw also promises improvements in feed behaviour, while a flattened transition to the crusher chamber optimises material flow. ce

Kleemann's new Mobicat MC 110(i) Evo2 jaw crusher

New beginnings

Alexandre Marchetta takes the helm of the Committee for European Construction Equipment, as Europe aims for recovery

The President and CEO of Group Mecalac Alexandre Marchetta will take care of the future of the European construction equipment industry for the next two years. On January 1st, 2022, he took over his new leadership role to steer the European industry association at a key moment of economic recovery.

"The beginning of my Presidency coincides with France taking over the rotating Presidency of the Council of the European Union. As CECE President I will devote particular attention to the issue of economic recovery, one of France's key priorities while heading the EU," said Alexandre Marchetta on the first day of his presidential mandate.

With his experience as a member of the French industry association EVOLIS, he will now focus his energy to the European level, dedicating his efforts to more than 1,200 construction equipment manufacturers across the European continent.

COMMITTEE FOR EUROPEAN CONSTRUCTION EQUIPMENT

CECE office in Brussels
E-mail: info@cece.eu
Tel: +32-2-706 82 26
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OPPORTUNITIES

In this area, CECE and the new president believe it is time to grasp the market opportunities arising from the EU Recovery Plan and continued investments in the EU built environment. Marchetta is entrusted to continue the long-term strategy of his predecessors to embrace the twin transitions towards a digital and decarbonised economy. CECE will monitor the rollout of the Green Deal proposals and strive to position Europe as a leader of low-impact solutions.

Alexandre is devoted to tackling the challenges of decarbonisation and sustainability. CECE's member companies are embracing and leading those transitions, with smart machines creating connected, safer and environment-friendly jobsites. As industry leaders we know we have a responsibility towards society and the next generations. That is why CECE has undertaken a structured approach towards both digital and green transitions.

DIGITALISATION

We believe that if properly managed, digitalisation can play a major role in increasing company's competitiveness and it could even change the positioning along the value chain in relation to customer needs. Furthermore, our innovative industry has invested heavily in "green" technology. Recent technical developments led to increased efficiency, decrease of noise limits and reduction of emissions. Our industry is making their products more sustainable overall.

The EU regulatory agenda will be another important issue. Indeed, in 2022 the industry expects the proposal for a harmonised system of road circulation requirements across the EU.

Moreover, 2022 will be the key year for the Machinery Regulation. "The legislation on machinery products is one of the most important for the CECE industry" highlighted Marchetta.

He added, "Since the beginning of the consultation process, CECE has been engaging with relevant stakeholders and, following the steps undertaken during Niklas Nillroth's Presidency, CECE will continue to take part in the discussions with the legislators and inform the debate on what Europe needs to remain a competitive and trustworthy manufacturing bloc."

WITH PASSION FOR THE CONSTRUCTION INDUSTRY

Alexandre Marchetta grew up in the tradition of a value-based, stable family business, which he joined in the design office first, then managing production for seven years. In 2009 he took over the development of the Mecalac Group's business activity.

In addition to his previous role as Mecalac CEO, he recently started presiding over the Board of the Mecalac Group, a family-owned company with over 1,000 people and a global footprint from a manufacturing and commercial point of view. He sees himself as someone, who takes responsibility for the ecosystem around the construction business with high respect for the manufacturers and their efforts, also during the Covid-19 pandemic with its unpredictable development.

The sourcing of key components and raw materials is still a problem for the industry caused by transportation disruption and delivery delays in the supply chain which finally resulted in market tensions. Concerning the future, Marchetta is optimistic that returning to normal business, meeting in-person and sharing personal contacts will bring an even brighter and more stable future.

Attracting the construction equipment manufacturing industry to the young generation is a task he will gladly accomplish, also for his own business.

PHOTO: CECE

> "...legislation on machinery is one of the most important for the CECE industry."

CECE CONGRESS HOSTED IN FRANCE IN JANUARY 2023

Alexandre Marchetta is ambitious. Hosting the next CECE Congress facing Mont Blanc, Europe's highest mountain, is not by chance.

Climbing the next steps right to the top to a climate neutral industry is a path that the new CECE president would like to walk together with the whole CECE community during his 2-years presidency.

The Congress will be hosted together with EVOLIS in Chamonix, France from 19th to 20th January 2023. All members and partners are invited to save-the-date. ce

PHOTO: ADOBE IMAGES

FIEC looks at current plans to reduce risk from respirable crystalline silica dust on construction sites?

Dust reduction

In 2020, the European social partners of the construction industry, FIEC and EFBWW (the European Federation of Building and Wood Workers) initiated the EU-funded project "Reducing Respirable Crystalline Silica Dust Effectively" to respond to the lowering of the EU occupational exposure limit value for silica dust to 0.1 mg/m^3.

The aim of the project was to produce a guide which can be used on construction sites to determine immediately whether the work is carried out according to low-dust practices. The 'mapping' of the most relevant construction activities involving dust generation presents the good and bad practices according to a traffic light system and is available in twelve languages.

This final outcome has been presented to a wide audience of national social partners and OSH (occupational safety and health) experts at the occasion of the closing conference of the project on 18 January 2022.

RECOGNISING RISKS

The EU provides a comprehensive legislative framework for the protection of workers' health, with various types of hazardous dust regulated in a number of Directives. But the proper implementation of this legal framework remains a challenge, especially in a work environment that is constantly changing. This constant change is one of the main characteristics of construction work. Furthermore, construction work presents a very high diversity of types of processes or equipment used. Therefore, the levels and circumstances of exposure to dust can vary significantly as well.

But workers and employers are equally concerned and therefore the topic of such hazardous substances was already put on the agenda of the European social partner organisations a long time ago.

Against this background, FIEC and EFBWW decided to go for a solution which could help workers and employers working below the new EU/national limit values in a very practical way. Indeed, based on the technical state of the art, concrete solutions for prevention of exposure to respirable crystalline silica dust are achievable for most construction activities.

DATA ON DUST

For the purpose of the project report, information from many countries on silica-related diseases was gathered and showed that whatever the context, construction work must always be carried out with as little dust as possible. Moreover, 271 exposure data sets were collected from 55 sources, describing 150 activities on construction sites. From these exposure data, it is clear that, when working without protective measures on construction sites, the exposure limit value is usually exceeded.

On the other hand, it has also been shown that technical protective measures, such as extraction systems on hand machines, often lead to considerable reductions in dust exposure. Indeed, many data sets show that, when using, for example, cut-off grinders or demolition hammers with extraction, the exposure is usually below the limit values.

Hence, the project report describes and recommends numerous low-dust techniques, based on practical experience from various countries. However, there are always specific individual situations where additional respiratory protection would be required. But the use of respiratory protection against dust on construction sites must be given special attention.

In the literature considered for the purpose of this project, it appeared that the attitude towards respiratory protection is very ambivalent. On the one hand, it is recommended as a 'backup measure', on the other, it is often emphasised that respiratory protection is usually not used very effectively. For instance, as a best practice, it is mentioned that construction workers should always be clean-shaved.

GLOBAL STANDARDS

The above recommendation of respiratory protection as a safeguard also ignores the STOP principle. The abbreviation STOP stands for Substitution, Technical measures, Organisational and Personal protective equipment. This hierarchy of protective measures is standard worldwide. With regard to the STOP principle, the project under consideration takes the following approach: if compliance with the exposure limit values is not possible by one technical or organisational measure, additional respiratory protection is not recommended. If there are doubts as to whether a technical measure is sufficient to achieve low-dust work, the use of air cleaners is recommended as an additional technical measure, for example as supplement to extraction on hand-held tools.

Air cleaners are not very well known on construction sites. They can be used to achieve virtually dust-free work. This is especially true indoors. In addition, air cleaners protect co-workers, residents, and the environment.

The conclusions drawn from the existing EU/national limit values, exposure measures, practical experience, and protective measures are described in the project report under 'activity-related exposures'.

On the basis of these exposures, a 'mapping' has been created, structured according to 25 different occupations, and which is designed for use on construction sites. ce

FIEC
Brussels, Belgium.
Tel: +32 2 514 55 35;
e-mail: info@fiec.eu
www.fiec.eu
@FIEC_Brussels
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Rachel Leggett **of Pinsent Masons looks at contract termination**

Termination

PHOTO: ADOBE IMAGES

As the impact of Covid-19 continues to place financial and operational strains on construction projects, it is important for parties to be aware of their rights in relation to termination and the risks associated with this action.

WHAT IS TERMINATION?

"Termination" in the context of construction contracts refers to ending the employment of the Contractor (or in the context of a subcontract, the Sub-Contractor) before completion. One party may seek to terminate where the other is failing to perform, ie, where a Contractor fails to correct defective works or an Employer fails to pay sums due to the Contractor.

A common misconception is that termination will discharge the contract itself. In fact, it is the parties' future obligations to perform which are brought to an end. Parties are effectively released from further performance of their primary obligations. For the Contractor, this includes the obligation to complete the remaining works and to correct any defects. For the Employer, this includes the obligation to pay for future works.

Importantly, the contract remains in place and the parties remain liable to fulfil any obligations which accrued prior to termination. Any rights that the parties may have accrued up to termination will also survive. Most standard form contracts include detailed termination provisions. When terminating under the contractual provisions, it is important to ensure strict compliance, including compliance with any notice requirements or the requirement to give the other party a certain period to cure its default.

In addition to the contractual right of termination, there will often by additional termination rights under the relevant governing law.

Under many common law systems, there is a right at law to terminate for repudiatory breach (defined under English law as a breach which goes to the root of the contract or substantially deprives the innocent party of the whole benefit of the contract). The innocent party has the option of accepting this repudiation thereby terminating the contract. If it does so it may be able to claim different remedies (such as a claim for loss of bargain damages) which might not be provided for under the contract termination provisions.

It should be noted that concept of repudiatory breach is not generally found in civil law jurisdictions, which may have very different termination principles. Parties should check carefully the additional rights and principles prescribed under the relevant governing law and take advice on these.

THE RISKS

Termination is a significant step which presents a number of risks for the terminating party. It can be described as a "zero sum game": there will be a winner and a loser and there is no middle ground. A party has one opportunity to get termination right and the consequences of getting it wrong can be severe.

From a legal perspective, the party seeking to terminate (whether by way of a contractual or common law right) has the burden of establishing a right to do so. If a party incorrectly asserts a right to terminate, this may amount to a repudiatory breach which is capable of acceptance by the other party. The innocent party may then have a claim for damages or for a reasonable price for the works performed to date.

There are also a number of commercial considerations to bear in mind. Termination can be a highly politicised step, particularly in high-profile publicly funded projects in which political success can be heavily linked to the success of the project. Terminating can give rise to a great deal of unwanted public scrutiny.

For projects which are financed through banks and other institutional lending, termination is a step which needs to be carefully thought through in terms of the impact on future financing, not only for the project in question but also any financing from these lenders for other projects. Any step to terminate should be taken in close consultation with and by agreement of the lenders.

In large infrastructure and energy projects, construction costs can be just a small part of the future income stream. Owners and Employers need to weigh up carefully the pros and cons of terminating a project as they risk jeopardising the longer-term gains to be made from securing the future income stream as soon as possible by focussing too heavily on the short term gains of terminating and replacing a contractor during the construction phase.

More generally, it is important to be realistic as to the perceived performance failures which may lead a party to consider terminating. There are often very good reasons why a Contractor is struggling to perform, for example unrealistic programme and budget requirements set by the Employer. In this case, replacing the Contractor may not resolve the issue.

Given the risks involved, advice should always be sought before taking steps to terminate. ce

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