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ANNUAL CONSTRUCTION REVIEW 2019

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EDITOR'S NOTE

AI IS THE future. As the futuristic technologies continue to seep into our everyday lives, Engineering, Procurement and Construction (EPC) companies cannot ignore it. In fact, AI and machine learning can help the projects take off more efficiently and deliver them on time. The PwC report found that impact of artificial intelligence (AI) and other emerging technologies in the Middle East could be worth US\$320bn by 2030. Our Annual Construction Analysis (p12, 19) explores how the sector can tap the potential of AI to aid businesses. Meanwhile, Saudi Arabia continues to dig deeper into its mining sector to reach its potential (p28). Finally, don't miss our Annual Construction Buyers' Guide (p48) offering a comprehensive overview to the region's construction suppliers and manufacturers.

At Technical Review we always welcome readers comments to trme@alaincharles.com

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TECHNICAL REVIEW

الخدمة لشركات المنطقة منذ 1984

الشرق الأوسط - النشر التقني

MIDDLE EAST

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Briefly

Saudi Arabia invites bids for Round Two of NREP, 1.47 GW to be tendered

THE RENEWABLE ENERGY project development office (REPDO) of Saudi Arabia's Ministry of Energy, Industry and Mineral Resources (MEIM) has issued the request for proposals (RFPs) for Round Two of its national renewable energy programme (NREP). The RFP for two 'Category A' projects was issued on 31 July, following the issuance of RFP for four 'Category B' solar projects on 18 July, according to Saudi Press Agency.

The six Round Two projects will see a total solar PV capacity of 1.47 GW tendered to qualified companies.

In June 2019, REPDO qualified 60 companies, including 28 from Saudi Arabia. Qualified companies will now proceed to the RFP stage as either managing member, technical member, or under a newly-created category of 'local managing member'.

Projects within Round Two will carry a minimum requirement of 17 per cent local content as calculated by the mechanisms defined by the local content and government procurement authority (LCGPA).

OPWP plans demand response study for electricity sector

OMAN POWER AND Water Procurement Company (OPWP) has invited proposals for carrying out a detailed report on demand response study for the sultanate's electricity sector.

"OPWP seeks proposals from interested bidders to carry out demand response study, programme design and proof-of-concept support project. The tender documents are electronically available and the interested parties can submit the documents till 4 September," the sultanate's sole buyer of power and water capacity said in a statement.

OPWP explained that the main objective of this project is to assist the company in ensuring that demand response participation is a prospective option for future capacity procurement alongside the current practice of procuring capacity. OPWP has set a target to achieve a 100MW capacity contribution from the Demand Response Program by 2025.

Two more packages awarded for Abu Dhabi-Dubai stretch

ETIHAD RAIL, THE developer and operator of the UAE national railway, has approved the award agreement for civil and track works of Packages B and C for Stage Two of the UAE national railway network connecting Abu Dhabi and Dubai, during a board meeting, chaired by Theyab bin Mohamed bin Zayed Al Nahyan, chairman of Etihad Rail. The total value of the works is US\$1.2bn.

Package B runs for 216km, and Package C runs for 94km, and the two packages are part of the 605km line from Ghuwairat to the Port of Fujairah on the eastern coast.

Al Nahyan stressed the importance of the UAE national railway network, which is recognised as one of the most important economic and development projects in the UAE, saying, "Etihad Rail will sustain the growth of our transport industry and freight carriage sector throughout the UAE, as railway systems are one of the most important means of transport on which countries depend to achieve their economic and social objectives."

He added that Etihad Rail's strategy is to build a railway



Photo Credit: Etihad Rail

When complete, the 1,200-km Etihad Rail project will link the UAE's principal centres of industry, manufacturing, production, population and import/export points.

network consistent with its clients' needs, and has signed a number of MoUs with national companies who are looking to use the railway network as a business solution, especially since goods of all kinds can be transported on railways at lower cost and more efficiently compared with traditional transport means.

"The launch of Packages B and C as part of the second stage of this project to connect all of the emirates is a milestone in the future prospects of the UAE. The importance of the two packages lays in the fact that they link Khalifa Port, Khalifa Industrial City (Kizad), and Jebel Ali Port.

The project includes links to strategic ports and industrial areas nationwide, along a distance of 310km. It is the backbone of the UAE national railway network, upgrading the transport and shipping industry by connecting ports, manufacturing and production points, as well as urban locations."

The works on this part of Stage Two focus on the design and construction of rail infrastructure, including earth works, bridges, tunnels, animal-crossings and track-laying, connecting Package B with Package A, and Package C with Package B.

Dubai developing transport system Expo 2020 Dubai

DUBAI IS CURRENTLY building an advanced transport system through several vital projects that will serve the expected 25mn visitors of Expo 2020 Dubai, which will take place under the slogan, 'Connecting Minds, Creating the Future'.

In a statement to WAM, Ahmed Al Khateeb, CEO of real estate development at Expo 2020 Dubai, said, "Plans have been drafted according to the highest international standards, to provide visitors with a leading mass transportation system, which includes the Dubai Metro, buses, and taxis, as well as private cars."

Al Khateeb added that the expo's three main entrances and the Dubai Metro entrance, as well as the availability of 30,000 parking lots, will ensure smooth entry and departure to and from the expo.

The plan includes the implementation of 'Route 2020', a 15-km extension of the Red Line of Dubai Metro to Expo 2020, to transport 44,000 people in both directions every hour.



Photo Credit: eiffel/Adobe Stock

Expo 2020 Dubai is cooperating with government institutions to provide a unique transportation experience to all visitors.

The Roads and Transport Authority (RTA) has completed its airport road project to increase the road's capacity, to handle the expected 95mn passengers travelling through Dubai International Airport in 2020. Also, the development of nine-km-long Al Yalays road with a capacity of four tracks in each direction, while work is under way to develop the roads leading to Expo 2020, which cost more than US\$816.7mn.

Bombardier-led consortium signs US\$4.5bn contract to build monorail in Egypt

BOMBARDIER TRANSPORTATION, ORASCOM Construction and Arab Contractors have signed an agreement with the National Authority for Tunnels in Cairo to design and build two monorail lines in Egypt.

On completion of the construction phase, the consortium will be responsible for the operation and maintenance of both lines for 30 years. The total value of the design, build, operation and maintenance contract exceeds US\$4.5bn.

Bombardier Transportation's share is US\$2.85bn. Orascom Construction's share of the overall contract is close to US\$900mn. The agreement is subject to final signatures of supplementary documents.

This project aims to enable fast, sustainable, comfortable and safe transportation for millions of people in the Cairo metropolitan area. The first monorail line will extend 54km from East Cairo to the New Administrative Capital. The second line will be 42km long to connect 6th October City to Giza.

The two lines will be able to transport around 45,000 passengers per hour in each direction. With operating speeds up to 80km/h, the journey time for the administrative centre will be approximately 60 minutes for the 54km line and about 42 minutes for 6th October City (42km line).

Orascom Construction will design and build all infrastructure and civil works, including stations, guideway structures and new depot buildings.

Bombardier will design, supply and install the electrical and



The project supports to enable fast, sustainable, comfortable and safe transportation.

Photo Credit: Bombardier

mechanical equipment for the two lines including 70 four-car Bombardier Innovia Monorail 300 trains (280 cars), Bombardier Cityflo 650 signalling and automatic train control technology, the operation control centre, communication systems, platform screen doors and fare collection, power supply/power distribution systems, as well as switch beams and depot equipment.

Bombardier statement said the Monorail systems are suitable for congested cities needing a fast and cost-effective to build mass transit solution and the Innovia Monorail 300 system provides good performance in driverless operations. The compact, elevated system enables easy urban integration into existing infrastructure.

The INNOVIA Monorail 300 system has been operating in Sao Paulo, Brazil, since 2014 and other examples are under construction in Bangkok, Thailand and Wuhu, China.

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EXECUTIVES' CALENDAR 2019

SEPTEMBER 2019

9-12	World Energy Congress	ABU DHABI	www.wec24.org
24-25	HSE Forum Oman	MUSCAT	www.hse-forum.com

OCTOBER 2019

7-9	Infra Oman	MUSCAT	www.infraoman.com
7-10	Saudi Build	RIYADH	www.saudibuild-expo.com
9-10	HSE Forum Kuwait	KUWAIT	www.hse-forum.com
21-23	WETEX	DUBAI	www.wetex.ae
30-31	Kuwait Smart Grid Conference & Exhibition	KUWAIT	www.kuwaitelectric.com

NOVEMBER 2019

3-5	ELECTRICX	CAIRO	www.electricxegypt.com
19-21	MEE Saudi	RIYADH	www.middleeastelectricitysaudi.com
25-28	Middle East Concrete	DUBAI	www.middleeastconcrete.com
25-28	The Big 5	DUBAI	www.thebig5.ae

Readers should verify dates and location with sponsoring organisations, as this information is sometimes subject to change.

Future of new HSE technologies to be discussed at the Kuwait forum in October

DESPITE THE RAPID advances in the health and safety sector, Kuwait faces a range of occupational health challenges, such as providing safer, healthier work environments, reducing environmental hazards, implementing effective health policies, promotion of healthy lifestyle and behaviour.

To address this, Kuwait needs to provide appropriate training in occupational health safety and environment issues.

Kuwait Health, Safety and Environment Forum 2019, from 9-10 October 2019 at JW Marriott Hotel, Kuwait City, will discuss best practices, process improvements, technological advancements and innovative applications to enhance HSE performance in Kuwait. The stage is for a neutral platform where a wide range of perspectives and concerns from a variety of stakeholders can be explored, creating new avenues of business.

Researched and developed by *Health, Safety and Security Review Middle East*, major topics to be discussed include safety in construction sites; working at heights; defensive driving and road safety; process safety; environmental contamination by



Last year's event had an extensive focus on all health and security aspects in the region's work environment.

industrial activities; indoor air quality and outdoor air quality; protecting workers with the aid of 3D modelling; ergonomics and optimising performance; health impact assessment; waste minimising and management in Kuwait; risk management and others.

Kuwait Safety and Environment Forum 2019 is set to provide a unique platform for delegates to meet face-to-face with leading decision-makers, understand their needs better and develop long-term business relationships.

The visitors can access information on the latest tools, trends, technologies and strategies while learning in an out-of-office environment.

Experts panellists include Dr Ahmad Al-

Shatti, director, occupational health department, Ministry of Health, Kuwait; Nasser Al-Buhairi, chief security officer and head of emergency coordination unit, Kuwait Oil Company; Sameera Al Kandari, director of planning and EIA Department, Environment Public Authority, Kuwait; Sajed Al Abdali, medical department leader, EQUATE Petrochemical Company; Dr Musaed Al Najjar, head – Asian region, International Police Science Association; and Janvier Gasana, associate professor, Department of Environmental and Occupational Health, Kuwait University.

Exhibitor profiles include monitoring equipment; personal protective equipment specialists; personal security at work; protection suits; safety flooring; safety footwear; safety gloves; safety signs and warning labels; safety torches and tools; safety training; process safety and electrical equipment; fire and explosion protection specialists; process safety management (PSM); specialist consulting and agencies; machine protection equipment manufacturer; technical risk assessment specialists; management system and database solution providers and many more.

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ON THE WEB

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Veolia wins Kuwait wastewater treatment plant contract of US\$63mn

KUWAIT INTEGRATED PETROLEUM Industries Company (KIPIC) has awarded Veolia, through its Veolia Middle East subsidiary, a US\$63mn operation and maintenance contract for Al Zour refinery wastewater treatment plant for a period of seven years. One of the largest refinery complexes in the world under development, the Al Zour refinery is set to have a production capacity of 615,000 bpd, increasing Kuwait's capacity to more than 1.5 mmbbl a day. Veolia will deploy its complex facility management expertise to optimise water treatment and recycling with a goal of zero liquid discharge (ZLD). www.technicalreviewmiddleeast.com/power-a-water



Photo Credit: Kamstrup

The wastewater treatment contract is worth US\$63mn.

Virgin Hyperloop One to build hyperloop test track in Saudi Arabia

VIRGIN HYPERLOOP ONE (VHO) will conduct a study to build the test and certification hyperloop track in Saudi Arabia. A 35km test and certification track will be built 100km north of the Red Sea port of Jeddah in King Abdullah Economic City. A research and development centre and hyperloop manufacturing facility will be set up north of Jeddah. According to VHO, travelling from Riyadh to Jeddah will be reduced from 10 hours to 76 minutes and moving from Riyadh to Abu Dhabi would take 48 minutes as against the current 8.5 hours. Jay Walder, CEO of Virgin Hyperloop, said that a hyperloop system could help enable Saudi Arabia to become a global transportation powerhouse. www.technicalreviewmiddleeast.com/logistics

Tungsum and AOI sign deal for manufacturing street lights in Egypt

THE ARAB ORGANISATION for Industrialisation (AOI) and Hungarian lighting company Tungsum have signed a Memorandum of Understanding (MoU) to jointly manufacture street lighting and other sustainable solutions in Egypt. The agreement has been signed by Mohamed Ahmed Morsi, managing director of AOI, and Tungsum group's president and CEO Joerg Bauer. According to the MoU, AOI will enter into multi-level business cooperation with Tungsum in several projects through the foundation of a joint venture. The main project is the production of outdoor street lighting. www.technicalreviewmiddleeast.com/power-a-water/renewables

EDF, Masdar achieve financial close on Saudi Arabia's first wind project

THE CONSORTIUM CONSISTING OF EDF Renewables and Abu Dhabi Future Energy Company (Masdar) has completed the financing of the Dumat Al Jandal utility-scale wind project in Saudi Arabia. With an installed capacity of 400MW, the Dumat Al Jandal project will be Saudi Arabia's first wind farm and the largest in the Middle East. Led by EDF Renewables and Masdar, the project construction will begin soon and commercial operations are due to start in Q1 2022. www.technicalreviewmiddleeast.com/power-a-water/renewables



Photo Credit: Myriam Zilles/Pixabay

The wind farm will be located 896km north of Riyadh.

Non-oil activity improving GCC's growth, says NBK

HIGH-FREQUENCY INDICATORS of non-oil activity point to general improvements in the GCC region's non-oil economies, according to a report by the National Bank of Kuwait (NBK). Higher energy prices, expansive public investments, and private sector stimulus programmes have spearheaded output gains over the last two years, said the report. needs of more than three million Iraqis, while also supporting the industrial sector. www.technicalreviewmiddleeast.com/business-a-management/



Photo Credit: Marko/Pixabay

GCC should continue economic diversification drive.

Dubai RTA implements 74 green economy solutions

DUBAI'S ROADS AND Transport Authority (RTA) has carried out 74 initiatives including projects in the field of green economy, environmental sustainability and power efficiency. The objective of this drive is to use sustainable options and respond to the UAE Green Growth Strategy launched in 2012 under the theme of 'Green Economy for Sustainable Development.' Nada Jasim, director of safety, risk, regulation and planning of RTA's strategy and corporate governance sector, said, "RTA contributes to reducing the carbon footprint in Dubai by increasing the number of public transport users (Dubai Metro, Tram and public buses). Using public transportation, instead of private vehicles, had saved 642,000 tonnes of CO2 emissions in 2018." www.technicalreviewmiddleeast.com/power-a-water/

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The shape of things to come

Artificial Intelligence is fast entering the construction industry, transforming the work process and making automation a vital element in reducing cost and increasing efficiency. Martin Clark and Abhishek Paul report.

The potential impact of artificial intelligence (AI) and other emerging technologies in the Middle East could be worth US\$320bn by 2030, according to one research report.

What might worry the construction firms of today is the potential to fundamentally disrupt markets through the creation of innovative new services and entirely new business models.

IN THE GCC, a region where populations are rising fast and jobs are in demand, it seems counterintuitive to integrate technologies that may replace human beings.

Yet, technology has already had such an immense impact across the board, including on the region's dynamic construction sector.

The potential impact of artificial intelligence (AI) and other emerging technologies in the Middle East could be worth US\$320bn by 2030, according to one research report.

But, as consultancy PwC notes, AI remains a source of huge excitement and apprehension, within the Gulf region itself, and beyond.

It says Saudi Arabia and the UAE look set to see the most impact from the rise of AI and related technologies, while the impact could be significant in Egypt and the smaller GCC economies of Bahrain, Kuwait and Oman.

After all the changes of the past decade though, where technological advances have already pushed the construction sector in directions inconceivable a decade or so ago (think flying drones and driverless trucks), is

there anything to be afraid of?

Advances in AI and related technologies – machine learning (ML), natural language processing (NLP) and robotics, among others – allow machines to sense, interpret, act and learn on data to aid decision-making.

In an era of Big Data and overwhelm, then that may well be a good thing.

The PwC report identifies the potential economic impact of AI in the Middle East and suggests that businesses will see more of opportunities than a threats.

While the benefits are there to see, what might worry the construction firms of today is the potential to fundamentally disrupt markets through the creation of innovative new services and entirely new business models.

"We've already seen the impact of the first wave of digitisation," the report notes. "With the eruption of AI, some of the market leaders in 10, even five years' time may be companies you've never heard of."

Thinking ahead

This suggests that tomorrow's market leaders in the GCC construction industry are

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likely to be exploring the possibilities of AI and setting their strategies today.

AI is fast entering the construction industry, transforming the work process and making automation a vital element in reducing cost and increasing efficiency.

According to Faisal Al Sarraj, Saudi Arabia transformation management partner at PwC, AI can transform project management by amplifying benefits from other technological breakthroughs such as analytics, robotics, process automation, IoT (Internet of Things), blockchain and, eventually, quantum computing.

“For example, in the construction industry, companies are combining drone technology with AI by using drones to monitor and capture information from sites and then using deep learning to correctly identify people, machinery and materials,” says Al Sarraj.

“AI-enabled project management tools can then identify risks and issues that require direct intervention, providing recommendations and progress reporting to the project manager and intervening directly if needed.”

The need for upskilling the workforce is clear in order to adapt and keep pace with such changes, and for all to thrive in the new era of AI.

However, the suggestion is that we must start to think of AI as a tool that will make our lives easier and complement businesses – that AI will assist us, not replace us.

Industry collaboration

There are even some clues where the new market leaders of the future might come from – and it points to a more collaborative industry than the more competitive field we have become accustomed to.

UAE construction firms and developers, for instance, have been called on to centralise their resources requirements and create a repository of shared project data to reduce

cost and time overruns and boost profitability.

Engineers from dozens of firms at the forum suggested that the industry should collaborate to formalise such a repository by integrating data from all projects utilising AI and blockchain technology.

The proposals were put forward at a Dubai forum of construction engineers held under the auspices of the Association of Global NICMARians (AGNI), an official alumni body of postgraduates from the National Institute of Construction Management and Research (NICMAR).

The need for upskilling the workforce is clear in order to adapt and keep pace with such changes, and for all to thrive in the new era of AI.

According to experts at the event, AI can be used to share communication and intelligence among different players as well as introduce automation wherever required.

Such collaboration would bring huge industry benefits for all, said BK Singh, executive director, VX Studio, an Ayana Holdings subsidiary.

“The construction industry generates about 50 GB of data with every project the industry delivers,” said Singh. “The data from designing, planning, scheduling, augmented reality, virtual reality and connected workforce are not shared across the platforms. It’s a wastage of resources. We can utilise the shared data to make our

future projects safer, cost-efficient and faster, which will increase profitability.”

Big Data

One of the prime motivations for such collaboration – and the embrace of AI technologies – is the management of ever-increasing volumes of data.

While this is a problem facing all sectors that have embraced digital technology, from energy to telecommunications, it is having a profound impact on the construction sector too.

The industry is now seen as passing through a crucial phase, one marked by high costs and time overruns, coupled with powerful technology disruption.

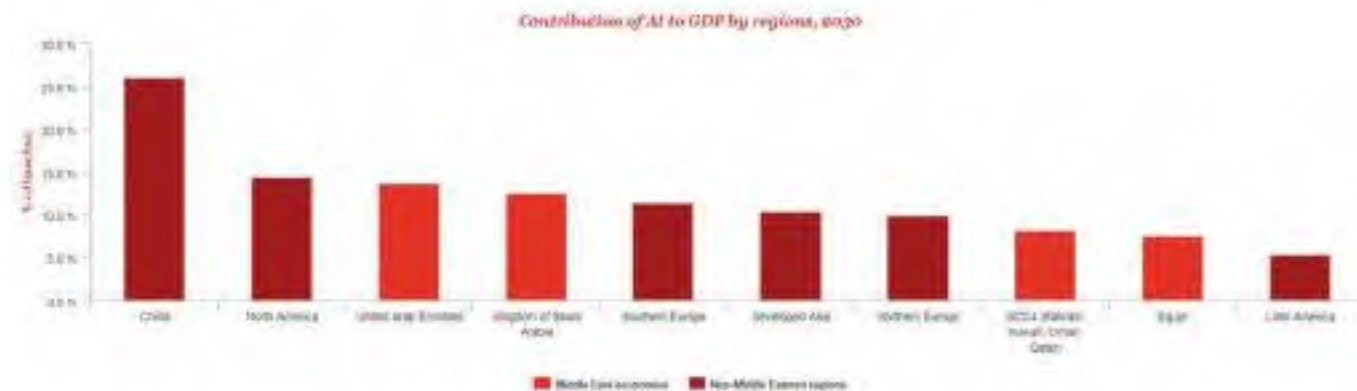
A central repository of information, linking all industry players, could provide a route to navigating this ever more complex and challenging environment.

“Almost 60 per cent of the tasks of the construction industry are technology-driven using AI, generating huge amounts of information and data,” added Singh. “Once the project is completed, this data remains idle. By sharing and integrating this data with other projects – even that of competing companies – the industry will be able to save on additional investment in new technology, thus reducing cost and increasing profitability.”

Whether competitors can come together to create such a pooled environment for data and information sharing with the aid of AI remains to be seen, though the benefits are apparent.

That includes the potential to streamline the disparate technologies that are deployed throughout the chain, whether in construction materials, green buildings or new machinery.

What seems certain is that with the rise of big data only in its infancy, AI technologies are here to stay – it is up to the engineers, project managers and chief executives to find out how best to embrace it.





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AI-powered applications set to revolutionise construction

ARTIFICIAL INTELLIGENCE (AI)

encompasses a large universe of possibilities and use cases, including machine learning, natural language processing, and robotics. McKinsey & Co has homed in on five AI applications used in other industries that have direct application in the construction sector.

Transportation route optimisation algorithms for project planning optimisation

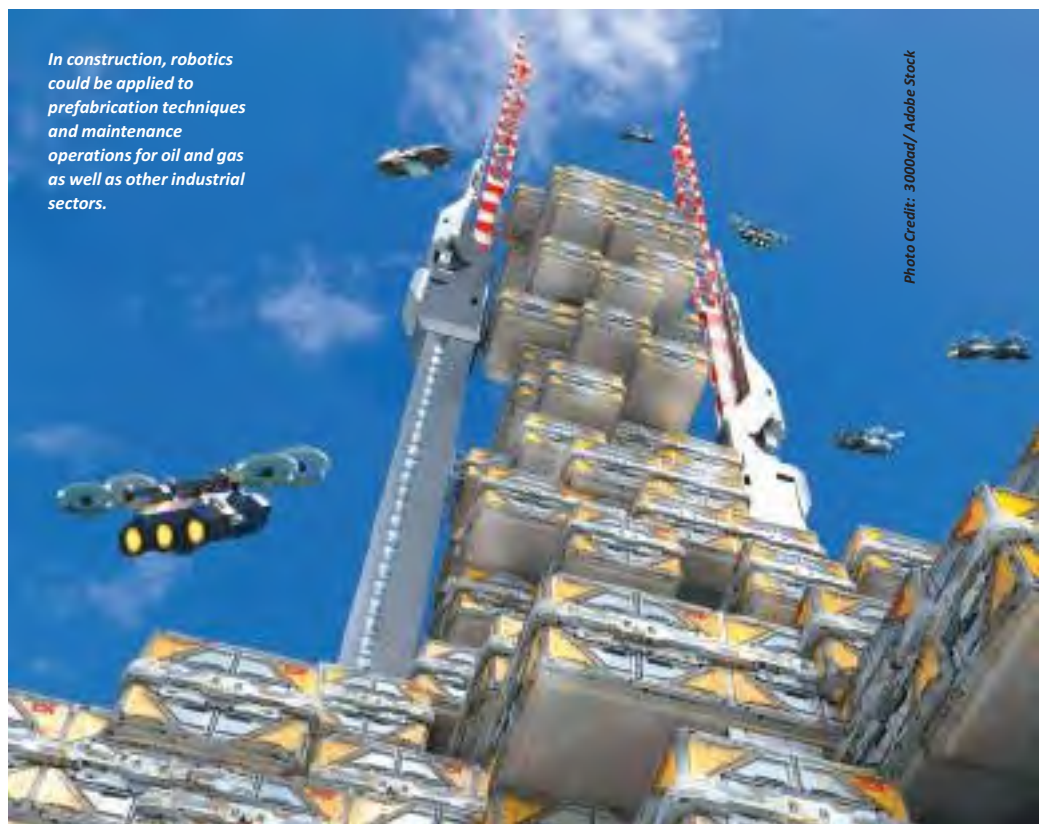
Currently available technology already offers transportation companies the ability to optimise routes and improve traffic navigation. In the future, an AI technique called reinforcement learning, which allows algorithms to learn based on trial and error, could provide even more effective optimisation, as well as solve for objective functions (e.g. duration or cost of fuel). Such technology could be directly applicable to E&C project planning and scheduling, as it has the potential to assess endless combinations and alternatives based on similar projects, optimising the best path and correcting themselves over time.

Pharmaceutical outcomes prediction for constructability issues

The pharmaceutical industry has emerged as a leader in investing its large R&D budgets into predictive AI solutions, which lower R&D costs in the long run, chiefly by forecasting medical trial outcomes. These applications can be directly applied to the construction industry – particularly in major projects with R&D budgets as large as those of major pharmaceutical companies – in two ways to forecast outcomes. First, predictive applications can forecast project risks, constructability, and the structural stability of various technical solutions, providing insight during the decision-making phase and potentially saving millions of dollars down the road. And second, these applications can enable testing of various materials, limiting the downtime of certain structures during inspection.

Retail supply chain optimisation for materials and inventory management

AI has changed the game for the retail supply chain by reducing manufacturing downtime, reducing oversupply, and increasing predictability of shipments – all resulting in impressive reductions in costs, logistical burdens, and variability. Supervised learning applications (e.g. gradient-boosting trees) will become directly applicable as modularisation and



In construction, robotics could be applied to prefabrication techniques and maintenance operations for oil and gas as well as other industrial sectors.

Photo Credit: 3000ad / Adobe Stock

prefabrication become more prevalent. More projects are using off-site construction for large quantities of materials, and the need for enhanced supply chain coordination will become critical to control costs and overall cash flows.

Robotics for modular or prefabrication construction and 3D printing

While use of modularisation and 3D printing is advancing in construction today, there could be a longer-term opportunity to maximise the benefits of these approaches through machine learning. For example, robotics industry researchers have successfully trained robotic arms to move by learning from simulations. In construction, this application could be applied to prefabrication techniques and maintenance operations for oil and gas as well as other industrial sectors.

The global market for 3D printing is expected to reach US\$120bn by 2020 and about US\$300bn by 2025, driven by research and product development activities and the increasing need for more creativity in the design process. 3D printing technology will ease the production process in various sectors, offering the prospects for major leaps in the world of industry.

Reports indicate that 3D printing technology will cut construction costs by between 50 per cent and 70 per cent, and cut labour costs by 50 per cent to 80 per cent. In addition, the technology will help reduce waste produced in construction operations by up to 60 per cent, which will reflect positively on the economic returns of the sector and contribute to sustainable development.

Healthcare image recognition for risk and safety management

In the healthcare industry, machine-learning methods are creating breakthroughs in image recognition to support the diagnosis of illnesses (e.g. detecting known markers for various conditions). Down the road, this technology could be applied to drone imagery and 3D-generated models to assess issues with quality control, such as defects in execution (structural and aesthetic) and early detection of critical events (e.g. bridge failure).

These techniques could help engineers compare developing and final products against initial designs, or train an unsafe-behaviours detection algorithm to identify safety risks in project sites based on millions of drone-collected images.

How to stay ahead of the AI curve

Identify high-impact use cases

Firms need to identify the areas of major need and what AI-powered use cases can have the most impact in the short term. Without a clear business case, ROI, and burning platform, construction firms will be inefficient in the use of time and resources, which can create frustration, increase skepticism in the organisation, and cause firms to lose momentum.

Dedicate R&D investment to digital capabilities

Today, the construction industry is investing roughly one per cent overall into technology – a significantly smaller proportion than other industries, such as financial services and manufacturing. Because the impact of AI is contingent on having the right data, construction leaders cannot take advantage of AI without first undertaking sustained digitisation efforts. This includes investing in the right tools and capabilities for data collection and processing, such as cloud infrastructure and advanced analytics.

Understand solutions from other industries

Industry insiders need to look beyond sector borders to understand where incumbents are becoming more vulnerable and to identify white space for growth. Both owners and the firms can explore non-traditional partnerships with organisations outside the industry to pool advanced R&D efforts that have multiple applications across industries.

Adapt the talent capabilities of the company

The industry will need to reverse its trend of under-investing in developing talent and place significant focus on hiring people from other industries with backgrounds and skill sets in AI and digital technologies. In addition, firms will need to re-skill their current workforces to acquire the necessary capabilities to thrive in the digital age and provide training in necessary concepts, such as machine learning algorithms.


Change internal processes to accommodate innovations

Today, the processes critical to actualising AI solutions – such as how to propose and implement a new idea – are handled several levels below the CEO. But top leadership needs to be involved in developing these processes and bolstering employees' flexibility to innovate. While seemingly a simple step to take, ensuring the C-suite is influencing process development is a key enabler of preparing to embrace AI.

First movers and fast followers will be rewarded


The concrete steps outlined above can serve as an immediate starting point for firms to pursue AI. Indeed, early movers will set the direction of the industry and reap both short- and long-term benefits. Though construction tends to lag behind by measure of technology adoption, now is the time for owners and firms to act and secure their places at the vanguard of pulling AI applications and techniques into the sector.


— Source: McKinsey & Co




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How to improve infrastructure delivery in the GCC

AT A WEBINAR hosted by MEED and Oracle on 'The outlook for infrastructure in the GCC – Between rightful selection of projects, delivery challenges and the role of technology', industry experts discussed effective approaches to deliver public infrastructure projects in the GCC to meet the development visions of each country in the region.

With approximately US\$495bn of infrastructure projects planned or underway in the GCC, the experts stated the limitations of the current infrastructure delivery model, which is focused on spending rather than productivity, and on short-term gains such as lowest price bidders winning the contracts.

Kenny Linn, partner – capital project services leader, PwC Middle East, said short-term value generation through procurement, fragmentation in the industry and low-profit margins would not sustain the ambitions of governments across the region against their vision statements.

"The market will look towards long term value of infrastructure. It needs to shift or transform towards that model," he said, adding that Saudi Arabia is moving from period of strategy-building – Vision 2030 – to execution.

Nour H Kassassir, vice-president and chief information officer of Parsons Middle East and Africa (MEA) business unit, said, "For the next five years it is going to be a good promising outlook for infrastructure."

However, Nour pointed out that companies with low-profit margins will struggle if they are not investing in innovation for next projects: "Low margins, late payment and disputes are stifling innovation and capability building in the industry. That's why governments and the industry really need to work together to create supply and demands for technology."

Commenting on the current commercial model, he said that as it was focused on delivering services to clients as opposed to outcome-based strategies, taking advantage of technology to the fullest remains hard to achieve.

He added that it requires the intervention of government as well

as the collaboration of contractors to access or enable technologies such as blockchain, 3D printing and AI in the construction industry. To just keep going with the status quo will not support the future development of infrastructure, he added.

A better strategy for procurement

All the experts underscored the fundamental issues with the present procurement strategy, as the projects are chunked into pieces such as design and construction over the 10 years before delivering it. "This leads to no continuity in data transmission," Nour stated.

With no common dataset across the entire supply chain to pass on throughout the project life cycle, the industry productivity remained low. Additionally, bringing in the collaboration component into the contract agreement of the projects would lead to transparency, he added.

On the efficiency front, for every US\$2 trillion spent on public projects, nearly US\$600bn was going waste due to inefficient strategies in place, the experts noted.

Transferring risk to all

Sherief Elabd, director of industry strategy and innovation, Oracle Construction and Engineering, said that costs paid against disputes, claims, arbitrations are massive in this region: "It leads into massive delays in the projects [delivery], operations, discontinuity from stakeholders and termination of work."

Managing risk has to be collaborative, and all the stakeholders from owners to vendors should adopt the practice, he added.

The speakers agreed that private-sector finance would be a vital element of future infrastructure in the GCC. They said the governments in the region must step up their efforts to provide commercially attractive infrastructure investment opportunities to private developers by bringing in transparency and encouraging collaboration. Additionally, modern software solutions must be used to manage every aspect of the project lifecycle and ensure data continuity across the supply chain. ■

For every US\$2 trillion spent on public projects, nearly US\$600bn was going waste due to inefficient strategies in place, the experts noted.



Photo Credit: badahos/Adobe Stock

Cut building time by up to 50 per cent

Waleed Khaled, Losberger De Boer Middle East's regional sales director, explores modular construction trends in the region and why the demand for it is increasing.

Photo Credit: brizmaker/Adobe Stock

THE UAE VISION 2021's ambitious plans are becoming a reality through the delivery of projects across a range of sectors, including healthcare, education, commerce and infrastructure. We are seeing demand for bigger projects, including Expo 2020 Dubai site, to be delivered faster than ever before. This has created a shift in demand for modular construction methods in the region.

Essentially, offsite modular construction allows for a building to be divided into smaller sections, which can be prefabricated in a factory setting, transported and assembled on-site. Individual sections can be manufactured simultaneously, allowing multiple activities to happen in parallel, dramatically decreasing project delivery timelines, with an average reduction of between 40 and 50 per cent for the large-scale projects we have delivered.

Markets and Markets forecast the value of the global modular construction market will reach US\$157.19bn by 2023. Although the Middle East makes up only a small part of this, we are seeing an increased appetite in the region. In the GCC alone, we have seen orders for our modular solutions increase by 22 per cent and see no signs of demand slowing down.

Developers are seeking 'plug and play' solutions for both new projects and the expansion of existing structures. Historically, we saw modular construction used for short-term venues – temporary modular structures were used for concerts, corporate and short-term sporting events, exhibitions and conferences. However, we are now providing semi-permanent retail solutions and sales centres, in addition to long-term events.

While the list of sectors utilising modular construction has grown, construction timeframes and budgets are shrinking due to ongoing challenging construction market conditions. Developers are clamping down on inefficiencies, seeking ways to improve

productivity levels and receive delivery of operational buildings at an accelerated rate. Modular construction embraces lean principles, eliminating waste in all forms – both time and materials. By reducing the resources required, costs can be managed more effectively, mitigating the risk of projects exceeding budgets. Despite timelines and budgets getting tighter, project sizes have experienced a dramatic increase. In Saudi Arabia, mega and giga projects dominate

the construction landscape. As a result, modular buildings are changing to accommodate the demand for taller, bigger structures. In 2018, we accelerated the launch of the iconic Qiddiya project by delivering an integrated complex of 15 semi-permanent buildings, including the Panorama Dome – the only one of its kind in the kingdom. To deliver this impressive project within 60 days, our team worked 9,360 hours over 36 days – the same structures would have taken up to two years to erect using traditional, non-modular, permanent builds.

Offsite construction also allows for less disruption to the surrounding community, so large-scale projects can be erected with minimal impact on surrounding roads and businesses. The lifespan of modular construction is lengthening and has the potential to

outlast traditional construction. In this region, many buildings have a lifespan of 15 to 20 years. The semi-permanent structures we deliver remain operational for up to 50 years.

Technology continues to impact the way we design and deliver structures and the adoption of new technologies is shaping how we approach turnkey projects in the Middle East. Virtual reality and augmented reality allow us to show the entire project before the construction process has begun.

While there are still limitations associated with modular construction, we are confident modular construction will continue to become more prevalent in the region, as developers embrace the benefits and efficiencies the concept offers. ■



Waleed Khaled is the regional sales director at Losberger De Boer Middle East.



Conserving natural resources with Renault Trucks

The vehicles will be used to help conserve and manage the UAE's forests and wildlife.

BARARI NATURAL RESOURCES, a forest management company in the UAE, has added three new Renault Trucks K to its fleet.

Barari Natural Resources plays a crucial role in conserving and managing forests and wildlife in the UAE, using technology to support the natural environment, a company statement said.

Having purchased its first Renault Trucks – the K440 T6x4 – in 2017, Barari Natural Resources has now upgraded to the latest models, one K460 T6x4 and two K440 P6x6 trucks. These models were chosen for their high ground clearance, with an approach angle of 32°, suitable for their work in forest management.

The K heavy construction range is fitted with 13L engines, offering a capacity of 120 tonnes and having automated transmission

along with all wheel drive (AWD) capabilities that deliver full power to all the wheels. This makes them fit for heavy duty use, strengthening the models' abilities to tackle the UAE's tough terrain.

Commenting on the new deal, Ghassan Fares, head of procurement at Barari Natural Resources, said, "We have been extremely impressed not only with the performance of our first K440 T6x4 truck, but also with the great aftersales service of Al Masaoood and the company's excellent long-term warranty. These factors made Renault Trucks the natural choice when we decided to expand our fleet of trucks."

The new trucks return low fuel consumption figures, making them some of the most environmentally friendly options in the market, in keeping with Barari Natural Resources' brand values.

"We were also impressed with the new trucks' fuel efficiency, which made them even more attractive as we are continually looking for ways to reduce our carbon footprint," Fares added.

Commercial director of Renault Trucks Middle East, Guillaume Zimmermann, added, "We are proud to continue to support Barari Natural Resources and their admirable efforts to protect and enhance the environment."

Mohamed Zeftawi, general manager of Al Masaoood Commercial Vehicles & Equipment (CV&E), stated, "Being the sole distributor for Renault Trucks in Abu Dhabi has helped us to deliver our service excellence and our major clients now range from government departments and civil defence through to industrial and commercial organisations.

"Our decades of experience in the UAE's automotive sales and after-sales market has allowed us to provide our customers with the highest professional standards of service. In addition, the heavy-duty trucks equipment we now have at our disposal has the right fleet of sustainable and environmentally friendly vehicles and we look forward to fully supporting Barari Natural Resources in the months and years ahead." ■

The new trucks return low fuel consumption figures, making them some of the most environmentally friendly options in the market, in keeping with Barari Natural Resources' brand values.



Volvo Trucks' upgraded engines cut fuel intake

Through a combination of new software and hardware upgrades for multiple markets, the D13 diesel engines can save up to three per cent on fuel consumption in long-haul operations.

VOLVO TRUCKS HAS introduced new functions to help drivers save fuel, even when cruise control is not activated.

The launch of upgraded D13 diesel engines for Euro III, Euro IV, Euro V and EEV markets, together with the new software, enables fuel savings of up to three per cent in long-haul operations.

Volvo Torque Assist is designed to reduce fuel consumption by providing more efficient driving when the cruise control is disabled in long haul operations.

"We have seen that there is a need to help drivers save fuel when the cruise control cannot be used. I-Cruise, our intelligent cruise control, is still the best way to optimise fuel consumption, but sometimes it might not be applicable. In this way we can support the driver to cut fuel costs in such driving situations," says Peter Hardin, director of product management at Volvo Trucks.

Volvo Torque Assist is designed to give more fuel-efficient driving by automatically adapting the truck's torque and acceleration to the road topography, the load and speed changes. The function is only active when driving without using cruise control.

Another supporting function keeps the amount of injected fuel constant after the engine's 'green range' has been passed. The slightly compromised performance is compensated by improved fuel economy.

The pedal map has been recalibrated. A less sensitive pedal creates a smoother torque development, which, in turn, makes

the truck easier to control.

"Drivers that are less skilled in economical driving benefit more than those who already have that driving style," explains Peter Hardin.

"The new software also gives a more significant result with heavy loads, many slope changes or large speed variations, while drivers transporting lighter loads with constant speed on flat roads will save less fuel. In field tests we have actually seen examples of a larger potential for savings, than the three per cent."

Upgraded hardware

The hardware upgrades in the Euro VI Step D versions of the D13 engine, released earlier in 2019, are raising the standards of the Euro III to V engines.

Internal friction has been reduced with new cylinder liners and new V-shaped oil scraper rings. The turbo efficiency has been improved and the engine management system is upgraded to a newer version with better capacity.

In all, these hardware upgrades save around one per cent fuel, while the fuel saving potential for the new software depends on driver experience and the operating conditions. ■

Volvo Torque Assist is designed to give more fuel-efficient driving by automatically adapting the truck's torque and acceleration to the road topography, the load and speed changes.

Big in size, cost-effective in production

The TA400 is the biggest model in Terex Trucks' articulated hauler range.

TEREX TRUCKS SPECIALISES in articulated haulers – and with a maximum payload of 38 tonnes (41.9 tons), the TA400 is the biggest model in the range.

From the interior of the cab to the design of the chassis, this durable machine has been created to perform in challenging applications. The TA400 has a heaped capacity of 23 cu/m and is powered by a fuel-efficient Scania DC13 engine that develops gross power of 331kW (444hp) and a maximum torque of 2,255 Nm.

The TA400's engine range is emissions compliant across multiple markets, and meets the requirements of EU and North American legislation without the need for a diesel particulate filter (DPF). This is achieved via the latest generation selective catalytic reduction (SCR) technology, combined with exhaust gas regeneration (EGR) and a variable geometry turbo (VGT).

The TA400's drivetrain is matched to the engine, thanks to automatic adaptive shifting capabilities and a pre-selected two-speed transfer box, along with longitudinal and limited slip transverse differential locks. This helps the articulated hauler to deliver improvements in performance and productivity, in a range of applications.

Doing more with less

Other features of the TA400 include good traction and an effective power-to-weight ratio, which ensures material is moved quickly in all conditions. Reducing operational costs, as well as enhancing safety, are the force-cooled multi-disc brakes.

The TA400's fuel-efficient engine range meets the requirements of EU and North American legislation without the need for a DPF.



Photo Credit: Terex Trucks

TA400 delivers cost-effective production at large-scale construction projects, quarries and mines.

Supported by an electronically activated exhaust brake and a six-stage modulating transmission retarder, the TA400 benefits from longer brake component lifecycles. The Allison HD4560 transmission boasts high performance oil and up to 6,000 hours between service intervals.

Additionally, the machine has magnetic suction filters, which reduce the risk of contaminants entering the hydraulic system. This helps maximise uptime through cleaner hydraulic oil, longer periods between maintenance and prolonged hydraulic component lifecycles.

Comfortable and convenient

The machine has a spacious, ergonomically designed, pressurised cab.

Acoustic insulation helps to minimise noise levels inside the cab, while a high performance and easily adjusted heating, ventilation, and air conditioning (HVAC) system ensures a stable temperature.

Other features that help to deliver a comfortable work environment include a tilt/telescopic steering wheel, an adaptive air suspension operator's seat with adjustable armrests, anti-vibration mounts for the engine and cab, and cushioned stops on the steering cylinders.

For safe and easy servicing, the TA400 has ground level test points, a fully tilting cab, an electronically raised hood and a full suite of on dash diagnostic and machine health check readouts, which helps to maximise uptime. ■

A LONG WAY TOGETHER



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Continental rolls out new radial tyres for port applications

AT THE 2019 TOC Europe, held in Rotterdam, Continental launched port tyre portfolio, specially designed for load and carry applications in terminal operations.

For these demanding load and carry applications common to ports, radial tyres are preferable in the tough Middle Eastern climate.

The tyres offer low heat generation and a flat tread contour, ensuring a high level of endurance and mileage over long distances. The three new radial tyres for port applications – the ContiRT20, the ContainerMaster Radial and the StraddleMaster Radial – are suitable for heavy forklift trucks, empty container handlers, reach stackers, straddle carriers and terminal tractors.

Continental's V.ply tyres with port plus compound, which are suitable for typical pick-and-stack applications, were also on display at the trade fair.

Mobile crane type vehicles such as



Continental ContainerMaster-Radial tyre

reach stackers, empty container handlers and rubber-tired gantry cranes (RTG) need to drive short distances at low speed when loading and unloading containers. However, they still have a high load requirement and a high degree of turning on the spot.

In such cases, the V.ply tyres offer stability and wear. Additionally, the stiff sidewalls and the highly abrasive and crack-resistant compound make them suitable to overcome the daily challenges faced in the region's climate.

New radial products are developed to deliver high mileage and good performance in load and carry applications.

Continental showcased its digital tyre pressure monitoring systems for individual vehicles and ContiConnect for fleets, which enhance safety and efficiency in terminal operations.

Photo Credit : Continental

Steer safe with Nokian tyre's grip and stability

NOKIAN HEAVY TYRES has launched Nokian Ground Kare, designed for modern wheeled excavators and backhoe loaders. The new tyre gives firm foundation on different surfaces such as meadows, roads and railways.

Use of heavy tools and work attachments as well as the need for fast highway transport is typical of today's contracting work. With its bigger load-bearing capacity, Ground Kare tyre is recommended for earthmoving, big and multi-function machines that handle heavy work attachments.

Excavating city parks and private yards filled with soil demand gentle approaches and accurate working methods. Ground Kare tyre was designed from ground up to fulfil these requirements.

Eva-Leena Varpe, product manager at Nokian Tyres, noted, "Grip and stability on site are the two defining tyre features."

Often, the block-patterned Nokian Armor Gard 2 tyre used to be a preference for stability and the wide, lug-patterned Nokian Excavator tyre for soft surfaces.

Striking a balance between these two features, the new block-patterned Nokian Ground Kare tyre offers better grip on soft surfaces, more stability and low surface pressure for little impact on soil. Self-cleaning properties, grip and soft touch for



Ground Kare's all-round ruggedness for rocky excavation sites and steel-belted structure protects the tyre against cuts and cracks.

soft surfaces, while condensed central blocks provide smooth driving on soft soils and highways.

"The Nokian Ground Kare tyres feature a purpose-built new tread design for good endurance and low ground pressure. The tyre's special rubber compound absorbs swings and shocks," Varpe said.

Ground Kare's all-round ruggedness for rocky excavation sites and steel-belted

structure protects the tyre against cuts and cracks. Additionally, it has a load-bearing capacity of up to 7500kg.

Ground Kare tyres are available from June 2019 onwards in sizes 650/45-22.5 for excavators and 620/60B34 for backhoe loaders.

The special railroad variant 620/60B34 Ground Kare semi-slick tyre will be available from December 2019.

Photo Credit: Nokian

Michelin and GM take air out of tyres for passenger vehicles

MICHELIN AND GENERAL MOTORS (GM) have collaborated to develop airless wheel technology for passenger vehicles – the MICHELIN Uptis Prototype (or unique punctureproof tyre system).

Michelin and GM announced a joint research agreement under which the companies intend to validate the Uptis Prototype with the goal of introducing it on passenger models as early as 2024.

Michelin and GM are testing the Uptis Prototype, beginning with vehicles such as the Chevrolet Bolt EV. Later this year, the companies will initiate real-world testing of Uptis on a test fleet of Bolt EV vehicles in Michigan. Because Uptis is airless, and the breakthrough wheel assembly eliminates the dangerous risk of flat tyres and blowouts. Benefits include:

- Drivers of passenger vehicles feel safer on the road.
- Operators of passenger vehicle fleets minimise downtime and improve efficiency resulting from flat tyres and near-zero levels of maintenance.
- Environmental savings through reduced use of raw materials for replacement tyre or spare tyre production.

The Uptis Prototype represents a major advancement toward achieving Michelin's VISION concept, which was presented at the Movin'On Summit in 2017 as an illustration of Michelin's strategy for research and development in sustainable mobility. The VISION concept introduced four main pillars of innovation – airless, connected, 3D-printed and 100 per cent sustainable.

"Uptis demonstrates that Michelin's vision for a future of sustainable mobility is clearly an achievable dream," said Florent



Uptis features improvements in architecture and composite materials, which enable Uptis to bear the car's weight at road-going speeds.

Photo Credit: Michelin

Menegaux, Michelin Group CEO. "Through work with strategic partners like GM, who share our ambitions for transforming mobility, we can seize the future today."

"General Motors is excited about the possibilities that Uptis presents, and we are thrilled to collaborate with Michelin on this breakthrough technology," said Steve Kiefer, senior vice-president, global purchasing and supply chain, GM. "Uptis is an ideal fit for propelling the automotive industry into the future and a great example of how our customers benefit when we collaborate and innovate with our supplier partners," he added.

The Uptis Prototype is re-engineered for

modern passenger vehicles, and is designed for emerging form of mobility. The vehicles and fleets of tomorrow – whether autonomous, all-electric, shared service or other applications – will demand near-zero maintenance from the tyre to maximise their operating capabilities.

"The Uptis Prototype demonstrates Michelin's capacity for innovation – in both the mastery of these high-tech materials, and also the development approach in close collaboration with GM, which validates our Vision concept as a roadmap for innovation," said Eric Vignes, executive vice-president, research and development, Group Michelin.



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WSK fan blower has been tested & Approved by UKAS Accredited Test Laboratory for Industrial & Marine Type Approval Testing. Additional Lab test rating to IP 66 and Salt Mist Highly Corrosive testing were also carried out. WSK fan blower has achieved excellent result in all the Type Approval testing including Salt Mist Corrosive environment & IP 66 rating.

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- WSK Fan Blower Vessel Approved - ClassNK.
- WSK Fan Vessel Class PDA - ABS.

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EV engines use electrical steel in their construction for its unique magnetic properties.

Driving the rEVolution

As the next wave of electric vehicles (EVs) begins to hit the roads, steel is set to play a vital role in the chassis, engines and charging stations that will power the cars of the future.

Photo Credit: temp-64GTX/Adobe Stock

THE WORLD IS evolving its mobility systems. Electric vehicles (EVs) are more attractive, high-performing and efficient than ever. And thanks to government policies across the globe supporting greener transport, there is set to be a dramatic increase in the number of EVs on our roads over the next five years.

Around 45 per cent of electric cars on the road in 2018 were in China – a total of 2.3mn – compared to 39 per cent in 2017. In comparison, Europe accounted for 24 per cent of the global fleet, and the US 22 per cent, according to Global EV Outlook 2019.

The global electric vehicle market is expected to witness a CAGR of 23.9 per cent and is projected to reach 51.5mn units by 2024.

The UAE government is seeking a 15 per cent reduction in carbon emissions by 2020 and 20 per cent adoption of EVs within its fleet.

In recent years, steel has increasingly been favoured over aluminium as the metal of choice in EV construction, largely because of its lower cost and superior strength. Materials like advanced high strength steels are playing a vital role in lowering vehicle weight while still offering high passenger protection.

EV manufacturer Tesla, for example, shifted to steel for its first mass market offering, the Model 3. Other manufacturers who have opted for steel in their vehicles including Nissan, for its Leaf model – the best-selling all-electric car worldwide – and Volkswagen for the e-Golf.

Magnetic appeal

The engines that power EV are reliant on the unique properties of steel. Electrical steel, which is manufactured to contain specific magnetic properties, is a vital component in

transformers and generators. This material is important for its use in the stators and rotors in the motor of an electric vehicle. Here it has a critical influence on the efficiency of the motor, minimising core energy losses and boosting the vehicle's range.

Motors used in industrial machinery typically operate at between 5,000-8,000 rpm, but the electric motors in modern vehicles can reach speeds four times higher than this. This generates significant heat, which can increase core losses and negatively impact vehicle performance. At this level of revolutions, the motor components undergo extreme mechanical stress and here electrical steel can be relied upon for its high durability.

Electrical steel is vital for its use in the stators and rotors in the motor of an electric vehicle.

In 2015, steel manufacturer thyssenkrupp developed new electrical steel that raised the bar for EV performance. This has resulted in core losses nearly 30 per cent lower when compared with motors made from conventional steel. It displays extreme strength that allows for more compact high-speed motors, lowering weight and reducing the space they take up in the engine bay.

Leading the charge

But while EVs are becoming increasingly

efficient, popular and affordable, one of the major challenges is having a comprehensive charging network.

Tasked with the responsibility of meeting the growing demand for charging stations, a number of electric vehicle charging options are being explored, and steel is often a vital component. Chargers such as the CHAdeMO charging system are leading the way, with many EV manufacturers – including Nissan, Mitsubishi and Tesla – investing in this model.

The future has never looked greener for EVs, but failing to deploy charging points could be a major barrier to ownership. Some analysts have predicted that EV charging station market will register a CAGR of over 33 per cent by 2023, according to Electric Vehicle (EV) Charging Station Industry 2019 Global Market research report.

The Dubai Electricity and Water Authority (DEWA) has successfully installed 200 electric charging stations in different areas of Dubai.

Schneider Electric, in collaboration with Lifestyle Developers, and IHCC, has set up the first electric vehicle (EV) charging station in Saudi Arabia. According to Richard Vilton, CEO of Emu Analytics, it is essential to invest in expanding this network early on.

"Companies that do this are not only poised to become global leaders in electric vehicles, but also have the opportunity to play an instrumental role in shaping a sustainable future," he concludes.

Whether its improving their efficiency, lightening their load without compromising on safety, or enabling the rollout of vital charging infrastructure, steel will play an important role in realising the electric vehicle rEVolution. ■

— Source: WorldSteel

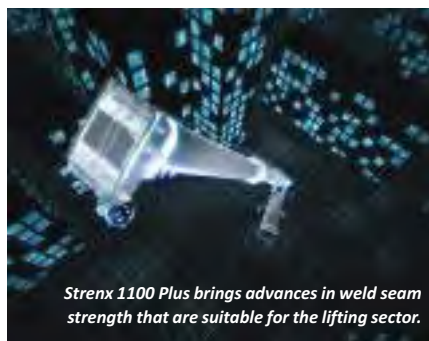
Boost performance with SSAB steel

SSAB HAS LAUNCHED Strenx 1100 Plus strip steel with better flatness, thickness and bendability features. This new product is designed to boost performance and productivity.

Available for immediate order, the new grade of hot-rolled, high-strength steel possesses welding properties, making it capable of delivering better welding and bending performance in booms, frames, cranes and other lifting equipment.

Part of the 1100 MPa range of Strenx performance steels, Strenx 1100 Plus brings advances in weld seam strength that are suitable for the lifting sector. Apart from offering customers and end-users lighter yet stronger equipment with an increased payload, it improves fuel economy.

Traditionally, weld seams can represent weak links in the highest grades of structural steels, such as S1100 and S900. But with



Strenx 1100 Plus brings advances in weld seam strength that are suitable for the lifting sector.

Strenx1100 Plus, such weld weaknesses are eliminated because the strength, elongation and impact toughness properties of the welded area meet the minimum guarantees of the base material.

The combination of strength and toughness of the welded and heat-affected area benefits the design engineering process. The design can be based on the

same minimum static strength for the entire application, depending on the design rules. Made for the applications which need welded joints, Strenx 1100 Plus is suitable for lifting equipment, and advanced structures that require matching strength in the welds. This means they can weld at the room temperature compared to other high yield strength steel products in the market.

Strenx 1100 Plus does not require any preheating when welded, based on CTS tests according to ISO 17642-2:2005. The recommended heat input interval is very wide, with cooling times, $t_{8/5}$, from five to 20 seconds.

Additionally, clean steel and a precisely controlled production process mean consistently high quality, predictable results. It offers optimal combination of strength and toughness in welded area and heat affected zone. ■



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The golden opportunity

Expansion in the mining industry presents growth opportunities in related sectors. An expected quadrupling of the mining industry's economic output will demand major investment in infrastructure, equipment and technology.

EFFORTS TO ENCOURAGE greater private sector participation have coincided with strong growth in Saudi Arabia's mining sector, a vital part of the country's diversification strategy and a prominent driver of broader economic expansion.

Mining grew by 6.3 per cent year-on-year in Q1 2018, according to data issued by the General Authority for Statistics.

The expansion in mining activity comes amid a push to attract private investment into the sector to further develop it as one of the main contributors to the economy.

Last year, Khalid Al Falih, minister of energy, industry and mineral resources, announced the completion of an adjusted mining investment system designed to incentivise investment in projects.

Under the revised mechanism, the kingdom aims to build a comprehensive database of its mineral resources, intensify exploration and develop new funding methods for projects.

The development aligns with the Vision 2030 economic strategy, which looks towards greater private sector involvement to diversify the economy away from its dependence on hydrocarbons.

As for the extent of mining's contribution, Al Falih said the government plans to make the sector the third pillar of the economy, alongside oil and downstream petrochemical production.

Saudi Arabian Mining Company

(Ma'aden) plans to boost gold output from about 415,000 ounces this year to one million by 2025, CEO Darren Davis said, according to a *Saudi Gazette* report. That would catapult the kingdom from a marginal gold producer to one of the world's top 20 suppliers, according to *Bloomberg*.

Gold demand is rising as US-China trade tensions and fear of a recession persist. With declining prices of some commodities, including aluminium, which generated 40 per cent of Ma'aden's revenue last year, the company may be counting on the precious metal's allure as a safe-haven investment to soften the hit.

Ma'aden will boost its exploration budget to US\$66.7mn in 2019, about triple its average annual spending over the past decade with focus on gold, copper and zinc.

"Global tensions have an impact on gold – in a positive way," Davis said.

Saudi Arabia plans to spend more than US\$7.4bn exploring for metals and minerals by 2035, part of a US\$426bn infrastructure spending plan that in part seeks to exploit what could be \$1.3tn in resources.

Ma'aden will boost its exploration budget to US\$66.7mn in 2019, about triple its average annual spending over the past decade, Davis added. The company will focus on gold, copper and zinc.

In July, Ma'aden awarded a contract to an Outotec and Larsen&Toubro consortium to complete the engineering, procurement, construction, pre-commissioning, commissioning and start-up assistance of the Mansourah & Massarah Project.

The project includes training services to develop national cadres on project engineering, operations and maintenance. The Mansourah & Massarah mines, processing plant and associated infrastructure will be located in the Central Arabian Gold Region, one of the richest geological areas in the kingdom. These are due to be completed in 2022.

The Mansourah & Massarah project will become the company's largest-ever gold project, producing an average of 250,000 ounces of gold per year over the life of mine. Total investment in the mine is expected to reach US\$880mn.

The processing plant will be capable of processing up to four mn tonnes of the

Photo Credit: Africa Studio/Adobe Stock

complex refractory ores contained in the deposit every year—the first time such ores have been mined and processed in the Middle East.

Ma'aden continues to pursue attractive growth opportunities in the kingdom and the Mansourah & Massarah project represents a major step for Ma'aden, not only because this will be their largest ever gold mine but also due to the technical complexity involved in processing this type of ore deposit.

Darren Davis said the company discovered the Mansourah & Massarah deposit after carrying out extensive exploration programmes in the region.

"This project is an important element of our strategy to increase our gold production to one million ounces a year. Our continued growth in the kingdom will create many direct and indirect job opportunities in the Saudi Arabian economy and contribute to the development of communities around our operational areas," said Davis.

Sustainability is a vital element of this project, as in other Ma'aden investments. This project will be the first in the kingdom to utilise solar power as an energy source. It will benefit from the treated wastewater through a 430km pipeline from the municipality of Al Ta'if to the remote and

water-scarce region where the mine will be located.

Ma'aden operates six gold mines in western Saudi Arabia, including the Ad Duwayhi mine, which achieved commercial production in 2017 and which produced 275,000 ounces in 2018.

Ma'aden plans to spend US\$67mn on new exploration concessions in 2019, marking a threefold increase in its investment commitment on previous years. It has launched an accelerated exploration programme to shorten the time needed to move new discoveries into development.

Ma'aden's Gold and Base Metals Company (MGBM), manages the production and sale of Ma'aden's gold, copper, silver and zinc, with gold accounting for the biggest segment.

Gold was the first commodity mined by Ma'aden and provided the foundation of the company's subsequent growth and diversification.

MGBM produced 415,000 ounces of the precious metal in 2018 and aims to increase this to one million ounces a year under Ma'aden's 2025 strategy.

The kingdom will invest around US\$3.8bn to enhance access to geoscience data and reduce regulatory red tape as it looks to boost mineral exploration.

The government plans to jumpstart the Saudi Arabian mining sector as part of a broader industrial strategy aimed at diversifying the economy and attracting private sector investments worth US\$426bn over the next decade. Investments will be made through the National Industrial Development and Logistics Program (NIDLP), part of Vision 2030, a reform strategy led by Crown Prince Mohammed bin Salman and it is intended to wean the economy off oil while creating jobs.

"For some time, the mining has been characterised by a lack of publicly available geoscience data, longer processing times on licenses and a lack of transparency," Khalid Al-Mudaifer, vice-minister of mining, told an African mining conference, in June 2019.

He said the US\$3.8bn would be spent on making it easier to do business and improving data quality to reduce the risks associated with investing in new mining opportunities for gold, zinc, rare earth metals and other minerals.

Saudi Arabia is one of the world's top phosphate suppliers and its mining sector employs around 250,000 people. The new laws of the kingdom allow for companies to work either with Ma'aden or through joint ventures with local companies. ■

Saudi Arabia plans to spend more than US\$7.4bn exploring for metals and minerals by 2035.



Photo Credit: photollurg/Adobe Stock

OpenRail's Connected Data Environment is a set of cloud-provisioned services that enable firms to better manage and access consistent, trusted and accurate information.

Photo Credit: Spectral-Design/Adobe Stock

Redefining transportation design with rail software

As the Middle East transportation sector is moving towards a more connected approach to meet complex challenges, Steve Cockerell, industry marketing director of rail and road, Bentley Systems, talks to *Technical Review Middle East* about the benefits of Bentley Systems' rail software.

Technical Review Middle East (TRME): Could you tell us more about Transportation Software Landscape from Bentley Systems?

Steve Cockerell (SC): The transportation industry, particularly in the Middle East, has always shown a strong desire to adopt the latest technology as part of a shared vision to design and deliver world class infrastructure. It includes rail but also the connections to roads, airports, and sea ports.

Recently, we at Bentley Systems have witnessed a noticeable shift by governments toward a more integrated or connected approach, investing in digitally led strategies to meet the complex challenges that they face in ensuring safe and reliable delivery and operation of transportation infrastructure.

It is not software leading this charge, but data. With IoT (Internet of Things) connected devices and Big Data analytics coming to the fore, it is the data owned and managed by an organisation that will be its most valuable asset.

Whereas previously, the work of different stakeholders involved in delivering projects might have focused on their own discipline and deliverables, government bodies are now looking for the organisations to adopt more structured engineering information requirements. These organisations must collaborate digitally before handing over or back the information to the project owner for use during operations and maintenance.

For many organisations, this shift in direction and pace will require a fundamental change to the way they do business. The continued emphasis on Bentley Systems to innovate with further BIM

advancements, and the introduction of "digital twins" for infrastructure project delivery and asset performance, will require organisations to do more than simply digitise previously manual and paper-based workflows.

TRME: What are the projects that you are currently involved in the Middle East and North Africa? Can you provide an example?

SC: Recently, Bentley applications helped with the Riyadh Metro project. The metro project includes the construction of a rapid transit system in the capital city of Riyadh, Saudi Arabia. When completed, the project will include six metro lines spanning a total length of 176km, with 85 stations. While the project had a light opening in 2019, it is expected to be fully operational by 2021.

TRME: Is there a particular software that you are dependent on for the projects?

SC: The organisation used Bentley's ComplyPro, which allowed users to clearly define, record, and manage project requirements through a cloud-based register, allowing each and every requirement to be recognised and managed efficiently.

TRME: What makes Bentley Systems' rail software stand out from your competitors?

SC: Bentley's mission is to provide innovative applications and services for the enterprises and professionals who design, build, and operate the world's infrastructure. Doing so will help sustain the

global economy and environment for improved quality of life.

However, it's highly likely that different disciplines will be involved. For example, civil, structural, mechanical, heating, drainage, lighting, and fire safety engineers will all need to share information and coordinate their work. They will need the information wherever they are based, and within whatever line they are working. At Bentley, the foundation of our solution is the connected data environment.

OpenRail's Connected Data Environment (CDE) is a set of cloud-provisioned services that enable firms to better manage and access consistent, trusted, and accurate information. An OpenRail CDE ensures that the "BIM potential" created by multidiscipline digital engineering models can be fully realised during project delivery. With an OpenRail CDE, owner-operators and their supply chains can share the benefits of seamless collaboration, helping improve decision making and deliver better business outcomes.

OpenRail's holistic approach also allows for the adoption of a systems engineering approach. Leveraging data within OpenRail's CDE, our ComplyPro software simplifies the delivery of compliance and assurance on rail projects, reducing the cost and time typically associated with poor design visibility and/or build non-compliance. The major differentiator here is that ComplyPro allows engineering and delivery teams to manage assurance of the design and delivery process collaboratively over time, reducing the need for costly parallel processes and increasing the integrity, efficiency, and quality of assets constructed.

TRME: Can advanced software monitor the health of the asset, as well as performing design functions?

SC: Yes. When you're talking about service and reliability in rail, it is really about operations and maintenance. The focus has shifted from on time and on budget provision of the required assets to the safe and efficient running of a railway. These capabilities are where Bentley's OpenRail AssetWise applications come to the fore.

Alongside ComplyPro, which provides continuous assurance and greater visibility into asset health during operations, OpenRail Asset Reliability and Operational Analytics draw upon the intelligent data stored and managed within the connected data environment, to deliver the potential for increased reliability and performance of linear and non-linear assets.

With linear assets like track or overhead line, information stored and used for analysis can be seen in registration against a schematic of the network and might include condition data from a track recording vehicle, ground-penetrating radar scans or walked inspections, plus work history. With OpenRail Operational Analytics, asset managers can review the information, analyse trending data, and identify problem areas before making informed decisions to resolve them.

For non-linear or "located" assets, Operational Analytics allows information managers to look at data received from sensors on assets across the network via a dashboard. This type of visual analysis of asset condition and performance offers the potential to



Steve Cockerell, industry marketing director, rail and road, Bentley Systems.

use near real-time data to warn when thresholds are reaching critical states. For example, a user might see warnings in the system telling them that the amperage on a switch is higher than normal. Then, they can use data in the connected data environment to look at maintenance records and/or work history to see what corrective measures have been implemented previously, at failure modes for the relevant asset, or suggested solutions.

This is an area where I think we will see significant change in the coming years. As the world at large moves rapidly towards the use of so-called 'Big Data' and real-time analytics using information from IoT connected devices, we will see the large-scale use of digital twins in rail. Here digital twins are synchronised with the physical asset out in the real-world using Bentley's iTwin Services, to support ongoing operations and maintenance. In this scenario, insight gained from a digital twin can be leveraged alongside the professional experience of the people involved to either simulate performance to a different set of criteria or predict solutions to problems long before they happen. ■

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Forging ahead with new technologies

In an interview with *Technical Review Middle East*, Asif S Khan, general manager—plant and equipment at Genavco, speaks about the strategies adopted by the company in response to the ever-evolving market conditions.

Technical Review Middle East (TRME): Please comment on Genavco's business in the current market scenario.

Asif S Khan (ASK): Operating across three verticals – commercial vehicles, equipment as well as lubricants – Genavco has always shown willingness to take on new challenges and invest in growth opportunities.

We are constantly trying to improve through value offerings, extended warranty, and by providing customised solutions. In the industrial equipment sector, for instance, demand for engines and transmissions power-pack for applications in oil and gas has increased. Several new projects, such as the Etihad rail in Abu Dhabi, will be having an impact on company performance.

As compared to 2018, the company is slightly ahead of the budget, so far. Undoubtedly, the after-sales service is a major factor in building customer relationships.

TRME: What new technologies are setting trends in the industry?

ASK: Genavco has always believed in innovation, and we are at the forefront of introducing new technologies to the UAE. For instance, the railway ballast pavers by Vögele will be an ideal solution to lay railway ballast with greater accuracy and desired compaction.



Asif S Khan

Photo Credit : Genavco

TRME: With the emphasis on sustainable practices, what are the latest developments in road-building?

ASK: There is a greater focus on recycling existing road materials, which leads to reduced operating costs. We have been engaged in projects in Abu Dhabi and are working closely with authorities, as well as providing a lot of study on the subject. Genavco recently sold a road recycling machine equipped with a laboratory. The UAE government is introducing several initiatives in sustainability and reducing the carbon footprint. We are also associated with the Roads and Transport Authority in various seminars on road recycling.

TRME: What is the short term outlook for the company?

ASK: We are certainly optimistic about the future, though the market is experiencing some downsizing. There is significant momentum in infrastructure associated projects. And the ability to invest in new technologies that provide greater efficiency and help achieve multiple tasks in lesser time is certainly the game-changer for the industry.

TRME: What courses are you offering at your training centre?

ASK: Our training centre offers variety of courses, from basic maintenance to diagnostic and technical analysis.

Our courses, such as engines and transmission maintenance, troubleshooting, maintenance and operators training, as well as courses related to pavers, rollers, milling machines, access platforms, forklifts, etc are focused on meeting the regional needs.

The training content introduces vital safety principles, and outlines the components necessary for companies and professionals to implement processes that will produce the safest product possible. We help customer plant and service personnel to achieve higher skills in supporting and servicing their equipment ■

UNH research finds thicker pavement is more cost-effective down the road

PAVEMENTS, WHICH ARE vulnerable to increased temperatures and excessive flooding, can crack and crumble. Climate change can be a major contributor and as greenhouse gas emissions continue, which scientists say have caused an increase in global temperatures since the mid-20th century, these issues are projected to accelerate.

Researchers at the University of New Hampshire (UNH) say because of these issues, one of the best ways to extend the life cycle of roads, and keep future costs down, is to increase the thickness of asphalt on certain roads.

"It's all about being strategic with the maintenance of our highways and byways," says Jo Sias, professor of civil and environmental engineering. "Just like a regular oil change can help

extend the life of a car, our research shows regular maintenance, like increasing the asphalt-layer thickness of some roads, can help protect them from further damage related to climate change."

In their study, published in the journal *Transportation Research Record*, researchers looked at the seasonal and long-term effects on pavement life, such as climate-change-induced temperature increases and higher groundwater levels due to sea levels rising, and heavy rains.

Based on analysis which examined the wear and tear of roads, the researchers determined that a seven per cent to 32 per cent increase in the asphalt-layer thickness might be the best way to maintain the service ability of some roads.

Booming construction sector to spur stone demand

The total worth of urban construction projects in the GCC set to exceed US\$1.12tn in 2019.



Photo Credit: Enrique del

The GCC stone market is worth more than US\$5bn and constitutes approximately 20 per cent of the global demand.

THE MIDDLE EAST region is witnessing a slew of large scale construction activities, either underway or planned, meaning opportunities for the stone market.

According to a report by MEED Projects published by The Big 5, the value of the MENA region's future projects exceeds US\$3.7tn, of which construction and civil construction projects account for US\$2.4tn. The report said 59 per cent of these upcoming construction projects are for mixed-used buildings, followed by infrastructure (21 per cent), apartments, houses and villas (seven per cent), airport, port and rail terminals (six per cent).

The large-scale construction activities in the GCC should give a big push for the stone market, which caters to the needs of diverse range of construction projects. While the combined value of all the construction projects in the GCC reached US\$2.52tn, the total worth of urban construction projects in the region exceeded US\$1.12tn in June 2019, according to BNC Construction Intelligence.

As part of the economic diversification plan, each country in the region has proposed major construction projects which require a high volume of natural stone, marble and ceramics, as per industry estimates. Additionally, the rising number of residential and commercial projects drive the GCC stone market. Many urban construction projects are supported by state-led urban development and planning programs, which are expected to drive the demand for flooring material over the next few years.

The value of planned and un-awarded construction projects in GCC countries alone is more than US\$1.4mn, according to MEED Projects. Of these, while a mixed-use type projects are dominating the market with 83 per cent, other projects such as mid-rise (10-30 storey) apartments, office buildings, housing, museums, mosques,

sports facilities, hospitals, hotels and commercial projects form the remaining 17 per cent.

The UAE remains the primary growth market with the highest number of urban construction projects in the region, followed by Saudi Arabia, which recently made several mega urban development announcements in line with the Saudi Vision 2030, the report revealed. Bahrain has more than 900 active urban construction projects with an estimate value of US\$46bn, whereas Kuwait has around 500 active urban construction projects with an estimated value of US\$75bn. In line with the Kuwait National Development 2035 vision, many housing and residential ventures are underway. Moreover, Egypt's growing construction sector has a vital role to play in the stone market. A report by The Big 5 Construct Egypt and MEED Projects stated Egypt has more than US\$300bn worth of planned and un-awarded projects.

There are approximately 1,800 projects valued more than US\$290bn in the concept and design stages in the GCC indicating a strong pipeline of projects to support a growing market of stone in the region. The GCC stone market is worth more than US\$5bn and constitutes approximately 20 per cent of the global demand in the stone, the report revealed.

The fifth edition of Middle East Stone, which showcases natural stone, marble, granite, design and technology in North Africa and the Middle East, will be held at the Dubai World Trade Centre from 25-28 November. This year, Middle East Stone will run alongside The Big 5 construction event.

Attendees will be able to discover the latest products and solutions from stone, marble and granite suppliers, by visiting international country pavilions including Brazil, Portugal and Greece, alongside brands such as Naturelmar and Franken-Schotter GmbH. ■

Hyva's EDGE Line range leverages new technology

HYVA'S NEW **EDGE** Line boasts its position in the truck-mounted crane sector. The line-up spans 1 to 165 tm and the models come with long warranties.

Designed to complement the 9 tm and 13-16 tm lines, the new product family means that Hyva offers solutions from mining to maintenance, construction to car recovery.

The 19-21 tm class is designed to meet all lifting requirements and comprises of 14 models and five different boom configurations:

HT – Telescopic boom (two models)

Compact, light, simple telescopic boom with side extensions; less space required for installation, easy to operate, suitable for applications such as car recovery.

HB – Basic articulated boom (two models)

Light booms and extensions; flexible, optimises cost and performance.

HC – Double linkage articulated boom (six models)

High performance double linkage, one on column and one on second boom, with liftrod articulated system (LAS); suitable solution for complex, difficult situations.

HC-K – Double linkage, short retractive secondary boom (two models)

High performance, heavy duty; installed on compact wheelbase trucks and designed for

the delivery of large loads, this crane is preferred for construction applications.

HC-e – Double linkage, endless slewing boom (two models)

High performance, endless slewing; faster cycle times, faster coverage of the working area.

Depending on the crane model, there are up to eight extensions, standard and auxiliary activations for attachments (by hose coiler or slides), a choice of jibs and winches, top seat or stand-up platform, and, LED working lights.

The Hyva EDGE Line has been designed to make crane operations easier, safer, quicker and simpler.

To achieve this, the cranes include a range of innovations which improve operator efficiency and safety, while increasing productivity. These include:

- Dynamic load diagram, which provides advance verification of crane lifting capacity based on truck stability.
- Magic touch, which allows automatic folding and unfolding to transport and working positions.
- Ergonomic control station, which has integral crane and stabiliser controls, an ergonomic working position, and a user-friendly interface, which delivers improved operator efficiency and safety together with increased productivity.



Photo Credit: Hyva

Hyva EDGE Line has been designed to make crane operations easier, safer, quicker and simpler.

- Slewing system, which is designed to achieve the wide slewing angle of 425°. "With our new EDGE Line cranes, we now offer a first-class lifting experience and the best available warranty. Our cranes deliver excellent capabilities across the truck-mounted crane range, in a variety of configurations," said Davide Catellani, line of business director – Cranes. "And, with state-of-the-art design, new hydraulics and electronics we are delivering choice, performance, safety and ease of use throughout our new range," he added. ■

LiUP crane driver elevator for tower cranes

LIEBHERR HAS LAUNCHED a crane driver elevator with drive technology powered by an electric motor with lithium-ion battery and the ability to recover up to 40 per cent of energy.

LiUP's battery is automatically charged when the crane is parked and the elevator can achieve approximately 40 per cent energy recovery as it descends.

Capable of transporting up to two people or a payload of 200kg, LiUP is designed to transport crane operators safely and efficiently, compared to climbing stairs.



Photo Credit: Liebherr

LiUP crane driver.

The lift can be used by service engineers for carrying out maintenance work.

There are no additional supply lines, such as cables or ropes, and, in the event of power failure, autarchic power is supplied by the lithium-ion battery technology.

Inductive sensors check whether a guide rail is installed and a redundant sensor system can detect people and prevent the risk of crush injuries. LiUP has already been deployed with Liebherr tower cranes.

Konecranes' reveals new materials management robot for warehouses

KONECRANES HAS UNVEILED a lift robot for its Agilon automated materials management system. This system aims to enhance customers' warehouse efficiency, particularly at larger storage premises.

The Agilon robot's ability to move diagonally, as well as horizontally and vertically, offers greater versatility compared to previous models, and it is equipped with Konecranes' latest software. This means accelerated transfers of items at customer sites, a more comprehensive reach in terms of warehouse size, and greater efficiency and insight for customers.

Most of the existing Agilon systems can be updated with the new lift robot. The first users of the updated systems include Agronic Oy, smartmile parcel service in Finland and Germany, as well as parcel terminals in the US.

"Our customers asked us to increase the performance of Konecranes Agilon, so it can be used in larger locations too. Our new robot solution, which also brings the latest innovations from our software, shows we can meet this demand and underlines our commitment to give customers unparalleled and unbeatable service," says Tapani Tilus, vice-president, Konecranes Agilon.

Konecranes Agilon, part of the company's technologies business, has improved daily warehouse management operations in more than a 100 locations globally. The system monitors the availability of tools, parts and components online; optimises internal logistics; enables more number of transactions; and increases the transparency and storage space in workshops, production plants and maintenance



Photo Credit: Konecranes

The patented and modular system can be used for storing and managing thousands of different components.

warehouses. The patented and modular system can be used for storing and managing thousands of different components. Agilon can handle materials of all shapes and sizes up to 60x40x45cm, with weights of up to 25kg. Every transaction is traceable, as every item entered into or removed from the system is user-, time- and date-stamped. All transaction information can be accessed through a web service that comes with the possibility to share information on availability within the supply chain and create automated replenishment processes between systems.

IDP supplies 35 Potain cranes for Egypt's development project

THE INTERNATIONAL DEVELOPMENT Programmes (IDP), Potain's dealer for Egypt, supplied more than 35 Potain tower cranes for New El Alamein City, an urban development project under construction on Egypt's northern coast.

New El Alamein City, part of Egypt's drive to build a new generation of modern cities, is aiming to offer year-round accommodation for more than three million

people across an area of 21,000 ha.

The new city will house hotels, universities, sports clubs, entertainment outlets, residential units, business centres and a scientific research centre.

The fleet of Potain cranes onsite includes MCT 85, MCT 205, MC 235 C and MC 310 K12 models. All are built at the Potain factory in Zhangjiagang, China.

Two of the preferred choices for the site

are the MCT 85 and MCT 205, both topless models. The MCT 85 is the successor to the MCI 85 A.

According to IDP, the cranes are configured at working heights of between 40 metres and 180 metres, with jib lengths ranging from 50-70 metres. The cranes are used around the clock rotating between three shifts daily and are expected to be onsite for at least five years.



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RMD Kwikform focus: Safety and flexibility

RMD Kwikform has made inroads into the Middle East ground-shoring market with innovation and bespoke solutions.

THE GROUND-SHORING market is on the rise in the Middle East and India and RMD Kwikform is determined to make a serious impression in the region, according to David White, the company's general manager for regional ground-shoring business in the Middle East.

Mr White said the ground-shoring market is already well-known in the UK and worth around £110 mn per year - and now the time is right for growth across the Middle East and India. He attributes the growth in the region's ground-shoring market to multiple factors. These include an increased oil price leading to governments spending more money on major building and infrastructure projects, a drive towards modernisation on older buildings, improved standards on new construction projects and, perhaps most importantly, a much-improved safety and sustainability culture.

"There is now more thought and care being taken for the protection of people on the ground," Mr White told *Technical Review Middle East*. As well as construction, industries which are reaping the practical and safety benefits of improved ground-shoring innovations include oil and gas, and water, including sectors such as stormwater management. In terms of sustainability, the products are durable and reusable. Mr White said that particularly in the UAE, reducing the carbon footprint has become a big priority for many companies. As such, moving away from a throwaway culture helps improve environmental stewardship.

"There is now more thought and care being taken for the protection of people on the ground."



Tubular solutions offer flexibility to customers.

With Expo 2020 Dubai on the horizon, there is a short-term opportunity for ground-shoring services, thanks to a flurry of building activity. This is to ensure major projects are finished ahead of this event so that, when the eyes of the world are on the city, half-completed sites are not spoiling Dubai's appearance. Conversely, this has led to some hotel and residential projects being put on hold until after the event but once these projects could be restarted, again, opportunities for ground-shoring should arise. But it's not just about Dubai - Mr White said that projects in Abu Dhabi, Ajman, Oman, Saudi and Kuwait are offering myriad opportunities for the company. He cited the Ajman City Centre mall project as a particularly strong example of their work.

The main ground-shoring products which RMD Kwikform is keenly promoting to the Middle East market include the trench box, manhole box and tubeshor. The trench box trench-lining systems are useful for areas with a high water table, which is very

common in the Middle East. Flexibility is important with the trench boxes - Mr White said these can be extended to a maximum depth of 5.6 metres.

Tubeshor hybrid hydraulic tubular shoring systems, meanwhile, are used for propping waling beams or capping beams on large excavations, as well as vertical applications, such as bridge-bearing replacements. An integral hydraulic ram unit is rated for an AWL up to 4,500kN once the mechanical lock off collar has been engaged.

Providing bespoke solutions is an important part of the service. As well as versatile systems, RMD Kwikform serves its Middle East customers with a design team in the UAE head office. Ground-shoring solutions can be designed at concept stage, driven by a geotechnical report.

Looking ahead, geobraces systems - incorporating a reusable waler beam which can be added to the Tubeshor range - will be the next innovation RMD Kwikform plans to bring to market in the Middle East at the end of this year and into 2020, complementing existing products.

"All our sales team have been trained in ground-shoring," Mr White said, emphasising the importance of expertise at every level in the company. "They are able to identify opportunities on the ground."

As well as flexibility with products, Mr White said that customers have different options for the terms of sale, with hire, purchase and buyback plans all on offer. As many Middle East projects require ground-shoring solutions for up to several months, these options help RMD Kwikform's customers determine which type of sale is best for their needs.

With plans afoot to move from the current Sharjah premises into a new, larger Middle East head office on the Sharjah-Dubai border, Mr White is optimistic about RMD Kwikform's future in the region. ■

www.rmdkwikform.com/ae



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- Salman Abdulla, Executive Vice-President, HSSEQ - EGA

“There were some good informative sessions and allowing people to attend such conferences challenges our thinking and we should always be looking to evolve the safety profession.”
- Shaun Hannan, Head of Safety, International Airport Operations, DNATA, Emirates Group

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'More than US\$300bn worth of projects planned'

In 2018, Egypt surpassed Saudi Arabia as the second-largest single projects market in the region, recording more than US\$33bn of contract awards.

The Big 5 Construct Egypt's second edition will bring together more than 300 Egyptian and international exhibitors of construction products, materials and solutions, along with over 13,000 visiting industry professionals.



Photo Credit: dmg events

THE BIG 5 CONSTRUCT Egypt will return for its second edition to the Egyptian International Exhibition Centre (EIEC) in Cairo from 2-4 September 2019.

The event is held in partnership between dmg events and ACG-ITF.

Following on from a successful launch in 2018, The Big 5 Construct Egypt will grow further, spreading across 20,000 sqm and putting a stronger focus on infrastructure and construction in Egypt.

"Egypt is in the midst of a construction boom," says Roni El Haddad, event director of The Big 5 Construct Egypt, commenting on the 'Egyptian Construction Market Report' which was released in partnership with MEED Projects.

"In total, more than US\$20bn worth of real estate and civil infrastructure projects valued US\$50m or above has been awarded over the past two years alone," El Haddad reveals.

According to the report, in fact, Egypt is the only country in the Middle East and North Africa region where overall spending on projects has grown during the past two years. The country has already overtaken Saudi Arabia as the second largest single projects market in the region, recording more than US\$33bn of contract awards in 2018.

The future looks more promising

"Egypt has more than US\$300bn of known planned and un-awarded projects, which gives it a project pipeline larger than any other regional market after Saudi Arabia and the UAE," says El Haddad, adding, "Construction is, by far, the largest future market in the

country, with more than US\$120bn worth of planned projects and growing. The time to invest in the Egyptian construction market is now."

Strong economic performance, population growth and a construction-focused government, which is prioritising delivery of projects and industrialisation, are among the main factors contributing to the sector's expansion.

"These factors create the perfect ground for a sustainable construction boom for years, if not decades, to come," El Haddad says. Some of the major active construction projects in Egypt include the new administrative capital to the east of Cairo, the New Alamein City on the North Coast, the Egyptian Grand Museum, a host of hotel and tourism developments, and the expansion of the existing Cairo metro network.

To match the expanding requirements of the Egyptian construction and infrastructure sectors, The Big 5 Construct Egypt is launching dedicated product sectors in 2019 – the Windows, Doors & Facades; Concrete; Form Work & Scaffolding; Infrastructure Systems and Services; and HVAC-R Egypt will be introduced for the first time next to MEP Services; Construction Tools & Building Materials; Building Interiors; Finishes; Hardware & Accessories; and Construction Technologies & Innovations.

More than 50 CPD-certified educational seminars will be offered for free to professionals attending the event this year, with the aim of supporting the development of the Egyptian construction sector.

The event is supported by Quali Middle East Association (QMEA) as official Knowledge Support Partner. ■

Robotics and automation at the fore

The Middle East logistics market is set to reach US\$66.3bn by 2020, according to regional experts.

MATERIALS HANDLING MIDDLE East, the region's dedicated trade show for warehousing, intralogistics and supply chain solutions, has evolved into a futuristic showcase of robotics and automation for its 2019 edition as Industry 4.0 continues to reshape the region's industrial landscape.

Running from 3-5 September at Dubai World Trade Centre (DWTC), the 10th edition of the biennial event, which will welcome more than 120 exhibitors from 20 countries, will highlight the latest automated solutions designed to improve operational and cost efficiency, increase production capacity, accelerate customer service and boost competitiveness within a rapidly-evolving logistics sector.

Swisslog Middle East, a global leader in robotic, data-driven and flexible automated solutions, will introduce highly efficient robotised storage and order processing solutions for small parts and pallets that integrate into existing buildings.

"Several businesses in the UAE and globally have benefitted immensely from logistics automation and, particularly in the Middle East, we are seeing increasing demand for automated logistics solutions in industries ranging from e-commerce and retail, to F&B and pharma," said Alain Kaddoum, general manager, Swisslog Middle East.

"While automated picking and packing has been around for a while, the next wave of change is being brought about by robotics. A warehouse that deploys robots reduces costs significantly while boosting efficiency."

As well as robotics, Kaddoum forecasts that digital transformation will significantly disrupt industry streams, such as inventory management, cargo loading, order picking, and real-time monitoring of stocks.

"Technology is and will continue to be a truly disruptive force in how the modern supply chain is shaped, defined, and explored. From basic improvements like streamlining operations and increasing process efficiency to fully automating delivery trucks, technology is enabling much smarter and simpler supply chain management," he said.

With the World Bank's 2018 Logistics Performance Index ranking the UAE 13th out of 160 countries, outstripping Canada, France, Finland, Denmark and Australia, the 2019 edition of Materials Handling Middle East is must-attend event for regional heavyweights and international players eager to increase their foothold in a super-competitive global marketplace.

Automation is now a major driver for the full spectrum of industries, including e-commerce. The UAE's e-commerce sector alone is currently worth US\$17.8bn, representing 45.6 per cent of the total value of the Middle East's e-commerce market, according to a Fitch Solutions report. ■

"In the future, companies will leverage new and innovative technologies to create a self-orchestrated supply chain and previously unimaginable efficiencies."

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The advertisement includes images of various traffic safety products such as flashing lights, a blue circular arrow sign, and traffic signals. At the bottom, there is a photograph of a multi-lane highway with several cars driving, illustrating the application of these products in a real-world traffic environment.

The 920K Series will soon be fitted with the Cat telematics system as a standard feature, but the system will be an option at first production.

Caterpillar's new 920K powers fuel efficiency

The compact wheel loader allows operators to choose between power modes - eco or standard.

Photo Credit: Cat

CATERPILLAR HAS ROLLED out its new 920K Compact Wheel Loader, with a net power rating of 74kW (99hp), designed to deliver high productivity and energy efficiency with a focus on versatility, operator convenience, safety and serviceability.

New features allow operators to tailor machine performance based on individual preferences for operating efficiency, and offer a choice of auxiliary-hydraulic systems expand the use of work tools.

Engine and fuel efficiency

The 920K's Cat C4.4 engine, which meets US Tier 3 equivalent and EU Stage IIIA equivalent emission levels, allows operators to choose between power modes – eco or standard.

While the eco mode offers enhanced fuel economy by operating at a lower maximum engine speed – 1,925 rpm, switching to standard mode lets the engine function at 2,350 rpm, providing more wheel torque and hydraulic power for demanding applications.

Intelligent power-management system of the 920K adds power when the machine senses high demands, such as climbing grades. On-demand power adjustment means optimum productivity and hydraulic speed under load. Fuel-saving features include an on-demand cooling fan, fast machine warm-up and lower sound levels while preventing overheating in hot climates.

Efficient operator environment

The 920K's deluxe cab features two side-entry doors, low-effort electro-hydraulic

joystick, suspended pedals, tilt steering wheel and an air-suspended seat. The joystick controller provides single-lever control of loading functions. Additionally, the joystick integrates transmission and differential-lock. Furthermore, the joystick accommodates controls for two-and three- hydraulic systems, including proportional control of auxiliary circuits.

An LCD monitor shows operating information via an easy-to-read backlit screen. An optional rearview camera with an in-cab monitor enhances rear visibility. Built-in control features (some available only with the Road and Load Feature Package) enhance operating efficiency and safety.

Providing optimum hydraulic performance at speeds that match the application, the modulated inching capability allows using the first half of brake pedal travel to control ground speed independent of engine speed. Another way to control ground speed independent of engine speed is through ground-speed ('creeper') control dial on the right console.

The implement-response system allows for three, adjustable, loader-performance settings, enabling operators to match loader responsiveness to the application. A directional-shift response system armed with three settings adjusts the speed of the transmission's change between forward and reverse travel.

Rim-pull control equipped with three settings – 60, 80, and 100 per cent – allows operators to modulate power to the wheels as ground conditions or applications vary,

reducing wheel spin for optimum grip.

The return-to-dig system allows operators to automatically reposition the loader linkage for the next cycle by simply moving the joystick to the boom-down detent position. The lift-kickout feature stops the loader arms at a pre-determined height when the joystick is in the boom-up detent. A bucket-float function allows the work tool to follow ground contour for a smooth finish.

Performance and versatility

The 920K is designed for high tipping loads, enhancing stability when handling heavy loads and large work tools. The 920K features Cat optimised Z-bar loader linkage, designed to provide the parallel-lift capability of IT (Integrated Tool Carrier) linkage, as well as the breakout force and aggressive digging capability of conventional Z-bar linkage.

The 920K is specifically designed to efficiently handle a range of work tools, increasing versatility. Quick-coupler options (including the Integrated Tool Carrier coupler) and screw-to-connect fittings facilitate tool changes. The IT coupler is compatible with legacy Cat work tools and designed to work with a range of attachments, including Cat Performance Series buckets, pallet forks, snow blowers and brooms. The 920K's hydraulic system can be configured for multiple valves to accommodate a variety of hydro-mechanical work tools, and a third-valve auxiliary system features proportional control with a roller switch in the joystick. ■

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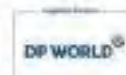
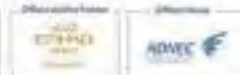
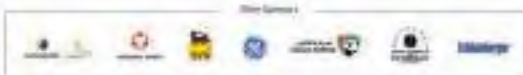
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ERM Telematics unveils IoT solutions to monitor and track assets

ERM ADVANCED TELEMATICS HAS introduced Internet of Things (IoT)-based sensing solutions to monitor and track the status of assets continuously according to pre-defined parameters.

Developed at ERM, the IoTLink line of products enable complete integration and interfacing of the ERM's main telematics solutions based on the Starlink technology for locating and tracking vehicles, drivers and passengers. Equipped with tracking, locating and monitoring of assets that are not necessarily in or on the vehicle, they are also suitable for assets such as activated machines and refrigerators for industrial or home. As part of the new IoTLink line, ERM's e2Sens comprehensive sensor provides the monitoring of assets in real-time. An add on product to e2Sens is e2Gate, which serves as a gateway to the e2Sens sensor and also can act as a standalone sensor.

Eaton introduces new gigabit network and industrial gateway cards

EATON HAS ANNOUNCED new capabilities to its existing gigabit network card and introduction of industrial gateway card, which is compatible with the MODBUS communications protocol.

With the added features, the gigabit network card can support not only single-phase UPSs, but also Eaton's three-phase 93PM, 93PS, 91PS and 9PHD UPSs. The card complies with the UL 2900-2-2 standard, which ensures the highest level of defences such as stronger encryption, configurable password policies, signed firmware packages and the use of signed digital certificates. New features available include remote and centralised authentication through LDAP/active directory and radius.

The industrial gateway card is designed for building management, industrial facilities and large data centres. It enhances the protection given by the UPS by providing real-time monitoring of the UPS system and environment through a building management system or industrial automation system. The card allows facility managers to monitor the state of the UPS, power conditions, temperature and humidity within the UPS network.

New VOLVO EC200D to improve fuel efficiency and output

VOLVO CONSTRUCTION EQUIPMENT'S (Volvo CE) new EC200D crawler excavator is designed specifically for delivering fuel efficiency, coupled with quality and productivity.

The EC200D crawler excavator is the 'perfect' partner for applications such as road construction, building projects, agriculture, landscaping and utilities work. The excavator delivers optimum swing speed, better-combined operation, powerful digging forces and fast cycle times.

The intelligent feature optimises the hydraulic system to reduce the loss of flow and pressure, without compromising digging power or swing torque. The hydraulics which works in harmony with the Volvo D5 engine delivers high torque at low rpm with good performance and fuel efficiency.

Go with the flow

The operator has the ability to manually control flow to the hydraulics using the integrated work mode system. Besides, the operator can choose from a selection of work modes – I (Idle), F (Fine), G (General), H (Heavy) and P (Power max) mode – according to the



The Volvo CE's EC200D crawler excavator.

Photo Credit: Volvo CE

demands of the task at hand. To reduce waste through idling, the EC200D includes the automatic idling feature.

Control and comfort

Greater control over the machine not only improves fuel efficiency but also cycle times for a productive and profitable work shift. Notably, the increased hydraulic flow makes it easier for the operator to improve the machine's controllability, achieving accurate control in grading and combined operations. The new I-ECU monitor displays all information, helping the operator stay confident and in control over the excavator. For effortless adjustment, the controls are ergonomically positioned and integrated into the keypad. The spacious Volvo cab also features an adjustable seat and ample legroom – because a

comfortable operator is a productive operator.

Built to last

It's not just these functions that ensure the EC200D is ready to work. The D-Series excavator's strength lies in its design, durability and wear resistance. All components are tested and proven to provide long-lasting performance, a good return on investment and high resale value.

Easy to inspect

The EC200D excavator makes daily service checks quick and easy to carry out, thanks to grouped filters and centralised lubrication points that are conveniently accessed from ground level. Full-size guard rails help maintain three-point contact at all times, while well-positioned punched anti-slip plates offer a secure footing.

Fronius offers long duty cycle and high productivity

FRONIUS TPS 600i welding system is designed to deliver a high deposition rate and welding speed, reduced cycle times, and improved productivity.

The design is fundamentally different from the TPS/i systems in lower power categories. With the more powerful power module, continuous operation is guaranteed for a long time. The TPS 600i achieves a 100 per cent duty cycle at up to 500 A during mechanised operation, which is ideal for the combination of long seams and thick materials with a maximum welding current output of 600 A and allows for a deposition rate of up to 13kg per hour. In all cases, the high output guarantees short cycle

times and high levels of productivity.

The TPS/i welding platform technology offers benefits such as equipping their welding system with process variants suited to a wide range of applications at any point.

The system measures the actual data continuously throughout the welding process and control algorithms respond

immediately to changes so as to maintain the desired target status. Also, the intuitive interface communicates with the user in 30 different languages.



The TPS 600i is a high performance welding system, which can weld consistently at 500 A during mechanised operation.

Photo Credit: Fronius

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Yokogawa releases wireless noise surveillance system

IN RESPONSE TO growing concerns over workers' productivity, health, safety and the environment at work places, Yokogawa Electric Corporation has developed a wireless noise surveillance system that monitors and maps plant noise levels in real-time.

This online plant noise surveillance system employs wireless technology and explosion-proof sensors. Even in plants where noise levels change drastically over time, noise mapping can be applied to plan work schedules. This process is designed to ensure that the workers do not spend more time in a noisy environment exceeding specified limits.

The principal components of this system are the WN100 wireless noise meter and the WN30 noise mapping software. Compliant with the ISA100 Wireless network protocol, WN100 sensors can be installed at many locations throughout a plant to measure noise levels and transmit this data in real time to servers via gateway devices. Wireless noise surveillance system is used in many sectors including oil, petrochemical, chemical, iron, steel and other types of plants.

Bosch launches new fixed dome camera range in Middle East

IN AN EFFORT to save up to 75 per cent in pre-configuration, installation and wireless remote commissioning, Bosch has launched the Flexidome IP starlight 8000i fixed dome cameras in the Middle East. The camera is suitable for indoor and outdoor areas, enables detailed image capture in challenging light conditions, and data analysis for improved security and delivering business insights.

The Flexidome's product concept is set-up in three steps: installing the mounting bracket, connecting the cables, and attaching the camera module.

With this model, installers can use the cameras entirely wirelessly, without having to repeatedly climb up and down ladders, or hire lift equipment to reach cameras at high levels.

A wireless contactable tablet or smartphone with the Bosch project assistant app can be used to adjust the pan, tilt, roll and zoom to set the required field of view.

ABB rolls out safer, more reliable flameproof motors in smaller frame sizes

ABB HAS INTRODUCED new IEC low voltage (LV) flameproof motors in smaller frame sizes 80-132, offering the same safety, reliability and efficiency features usually found in ABB's larger products.

These motors are suitable for use in hazardous and explosive environments, typically found in the chemical, mining, and oil and gas industries. Despite being smaller, the motors are flexible enough to allow customers to add features such as bearing vibration and temperature monitors which can alert operators to performance issues. This ensures maintenance occurs to prevent unexpected downtime. An advanced surface treatment applied to the motors means they can withstand tough conditions, for example those on an offshore oil rig.

"Based on customer feedback, we designed the smaller flameproof motors with the same options and safety features found in larger ABB flameproof motors," says Tom Eklöf, product manager, IEC low voltage motors, ABB. "We can

now offer customers an IE3 low voltage flameproof range that covers frame sizes 80 up to 450 that deliver safety, reliability and long operational life."

The motors have multiple lifting lugs that make them easier to handle. The option to fit an auxiliary terminal box enhances safety in applications where sensors or anti-condensation heaters are needed, because it keeps the auxiliary connections separate from the motor supply terminal box.

The motors are available in IE2 and IE3 efficiency classes. They are supplied with ATEX and global IECEx certification, and are certified for use with variable speed drives. The motors are available in 2-8 pole versions, in all common voltages, for 50 and 60Hz.

ABB offers a complete IE3 range of standard, flameproof (Ex db and Ex db eb), increased safety (Ex ec) and dust ignition protection (Ex t) motors, meeting the needs of customers in countries where these types of motors are covered by minimum energy performance standard (MEPS) requirements.



Photo Credit: ABB
ABB's new IEC low voltage (LV) flameproof motors are ideal for hazardous and explosive environments.

WEG partners with Embraer to develop electric motor planes

MANUFACTURER OF ELECTRIC motors and generators WEG has teamed up with aircraft technology developer OEM Embraer to build the next generation electric aircraft propulsion technologies.

With the technology cooperation agreement between the two Brazilian companies in place, they will collaborate to accelerate knowledge in electrification process, aiming to achieve energy efficiency and environmental sustainability in the aerospace sector.

Daniel Moczydlower, executive vice-president of engineering and technology at Embraer, said, "Advances in scientific research can make clean, renewable energy a major enabler of new urban and regional air transport that is more accessible to the population."

It is expected that the cooperation between the two companies will lead to the creation of innovative technologies, generating opportunities for future aerospace platforms and developing new market segments.

After testing the newly developed technologies in the laboratory, an aerospace platform will be used for the integration and



Photo Credit: WEG
The WEG team at the collaboration event.

testing of complex systems under real operating conditions. A small, single-engine aircraft, based on the EMB-203 Ipanema, will be used as the test bed for primary evaluation. An electric-powered demonstrator has its first flight scheduled for 2020.

Manfred Peter Johann, managing director of WEG Automation, added, "Our powertrain technology, developed over years for tried-and-tested applications in trains, buses, trucks and boats, and in constant evolution, has paved the way for this exciting scientific and technological cooperation project."

MB's unique drum cutters for 'millimetric' precision

WITH 20 YEARS' experience in building crusher and screening buckets, Italian manufacturer MB Crusher has developed a new hydraulic drum cutter to deal with digging, cutting, profiling, or reducing hard materials with 'millimetric' precision.

This hydraulic drum cutter works well for difficult construction sites, city centres, historic buildings and bridges. In the agricultural sector, precision drum cutters are used for clearing and dredging land, creating irrigation systems, levelling river beds, digging tunnels and milling wood. Additionally, precision drum cutters can be put to use for profiling rock walls in quarries and mines, as well as underwater immersion situations.



Drum cutter MB-R800 on Caterpillar excavator.

Diego Azzolin, MB Crusher's production manager, said, "Our company's working philosophy is to improve the machinery and optimise work operations in building sites. In fact, MB Crusher drum cutters are the only ones in the world market utilising a direct drive twin motor system."

MB Crusher developed a system to control torsions. With this system, structural stress on the excavator's arm is absorbed and drastically reduced, increasing precision and durability while saving time and money. Specifically for construction sites in urban centres, the company has also designed the dust suppression kit and drum cover kit to reduce dust emissions.

To deal with delivery time constraints faced by construction site managers, these drum cutters are designed to be easily replaced on-site, in less than an hour. To protect the machine's central casing, specially designed wear plates have been applied as well as a protective high-temperature reduction kit designed to lower the operated machinery's oil temperature without altering its performance. The cutter rotation kit is designed for road work and trench digging, allowing the operator to rotate the cutter directly from the cab without stopping the excavation work.

Study finds AI design can cut heat pump energy consumption

RESEARCHERS AT EPFL with the help of artificial intelligence designed microturbocompressors which aim to cut down the heat pumps' power consumption by 20-25 per cent.

Though the turbocompressors are more efficient and 10 times smaller than piston devices, embedding these mini components into heat pumps' designs is not simple. Complications arise from their tiny diameters (<20 mm) and fast rotation speeds (>200,000 rpm).

However, a team of researchers at EPFL's laboratory for applied mechanical design came up with a smart method, making the process of fitting turbocompressors to heat pumps easier and faster.

According to the researchers, application of a machine-learning process called symbolic regression paved the way for developing simple equations to quickly calculate the optimal dimensions of a turbocompressor for a given heat pump.

By employing this method, the researchers have simplified the initial stage in designing turbochargers. Until now, engineers have been using design charts to size their turbocompressors. Advantages of microturbocompressors, which come with diameters of just a few dozen millimetres, include functioning without oil, rotating on gas bearings at speeds of hundreds of thousands of rpm and operating without any friction. As a result, these small systems could boost heat pumps' heat transfer coefficients by 20-30 per cent.

So far, engineers have been designing charts to size their turbocompressors. In an attempt to develop an effective alternative to chart method, the EPFL researchers fed the results of 500,000 simulations into machine-learning algorithms and generated equations that replicate the charts. According to researchers, this method delivers better results as these equations are reliable even at small turbocompressor sizes and 1,500 times faster. With this method, the engineers can skip some of the steps in conventional design processes, paving the way for easier implementation and more use of microturbochargers in heat pumps, the researchers claim.

WIRTGEN launches new milling tools

WIRTGEN HAS DEVELOPED new milling tools for soil stabilisation. These tools are suitable to process a wide variety of soil types, from highly cohesive to interspersed with coarse rock to abrasive.

In addition to the point attack cutting tools with conventional carbide tips, the company's range of picks for soil stabilization now includes Wirtgen Compact Carbide (WCC) milling tools.

Due to their shape and materials, WCC milling tools are recommended for mixing of cohesive soils interspersed with large pieces of rock. Additionally, the tools are highly wear-resistant carbide cutting edge as well as impact-resistant due to the enormous strength of the material.

MaK's new maritime propulsion offers emission cuts and fuel savings

AIMED AT CUTTING clients' costs by driving down fuel consumption, MaK Middle East LLC, service arm of Caterpillar Motoren, has announced a fuel-efficient, eco-friendly maritime propulsion system with its LNG engines.

Alan Naisby, managing director of MaK Middle East and MaK Asia, said, "After much deliberation by shipping companies, LNG is now regarded as a bridge technology. Caterpillar's known history of research and development with dual-fuel technology has allowed us to transfer much of our know-how to marine engines." Together with the IMO's mandate for reduction in global emission limit on the seas, these have been the key drivers in the success of our LNG-fueled MaK engines, he added.

Caterpillar Motoren's addition of dual-fuel engines to its portfolio of MaK marine diesel engines was in the works even prior to MaK Middle East's inception as a regional service provider. With Caterpillar Motoren initially designing, manufacturing and supplying one of its patented VM46DF (dual-fuel) engines to both the AIDAprima and AIDAprera cruise ships, this laid the groundwork to fully power the cruise ships including AIDAnova with 4 x VM46DF (dual-fuel) engines, making that vessel the first in the world able to operate solely on LNG, drawing fuel from onboard tanks.

The MaK M46DF (dual-fuel) based propulsion unit comes as an in-line engine with six to nine cylinders and as a V-engine with 12 to 16 cylinders.



MaK's new fuel-efficient maritime propulsion system with its LNG engines.

Photo Credit: MaK

Raimondi presents Luffing crane-LR372 for heavy-lifting

RAIMONDI CRANES HAS unveiled the LR372. Equipped with Raimondi's winches, the LR372 is a 370 ton-meter class luffing tower crane with a maximum jib length of 60 metres and a maximum capacity of 20,000kg in two falls configuration. At the maximum radius, the LR372 can lift 3,795kg using ultra lift mode.

Domenico Ciano, CEO of Raimondi Cranes, said the LR372 can be installed on two different types of towers: for an internal climbing system, the new GR5H tower at a width of two metres, or the 2.3 metre width GR6 tower series (GR6B, GR6 and GR6L inclusive), for standard, external, and internal climbing configurations.

All of the aforementioned towers are available in different lengths for easy configuration. The GR6L towers can be installed on embedded legs and on an 8x8 in addition to the new 6x6-metre strut cross base with or without travelling system. The GR5H towers can be installed on embedded elements and on a 6x6-metre strut cross base.

New range of tools powered with lithium-ion batteries from JCB

JCB TOOLS HAS launched a new range of trade-quality power and hand tools.

The cordless range includes power tools featuring brushless motors. By eliminating the need for carbon brushes, the energy normally lost to friction and the resulting heat build-up goes into delivering higher performance and greater long-term efficiency. Brushless motors also have less wearable parts resulting in greater durability, extended motor life and quieter operation.

The tools are powered by lithium-ion batteries providing a range of kit options from 2Ah through to 5Ah. This technology enables the prolonged use of cordless power tools and maximum mobility. The range is powered by a single battery solution across all products in order to maximise flexibility, economy and mobility.

The new tools and accessory kits are available in kit bags and also in the JCB L-Box storage system made by Sortimo. The L-Box system provides secure storage, efficient use of transportation space.

New waste expert telescopic loaders from Bobcat

BOBCAT HAS LAUNCHED the waste expert range of telescopic loaders for the waste and recycling markets.

A prototype waste expert machine (based on the TL43.80HF model) shown by Bobcat at the Bauma exhibition was well received. As a result, Bobcat is offering four of the company's current productivity and high-flow telescopic loaders, the TL35.70, TL34.65HF, TL38.70HF and TL43.80HF, as new waste expert machines, all powered by Bobcat Stage IV 74.5 or 97 kW (100 or 130 HP) engines.

The waste expert telescopic loaders offer lifting capacities from 3.4 to 4.3 tonnes and lifting heights from 6.5 to 8 m.

Olivier Traccucci, Bobcat Telehandler senior product manager, said, "Waste and recycling businesses need versatile machines that can handle a large variety of tasks, manoeuvre well in tight spaces and provide maximum efficiency in full safety throughout the working day. With the toughest design on the market, impressive bucket breakout forces, efficient cooling systems, a low centre of gravity and a long wheel base to enhance stability and lift capacity, our new waste expert telescopic loaders are suited for the waste and recycling markets."

The waste expert machines incorporate an extra large boom head, a high tensile steel boom, boom cushioning and protected hydraulic rams under and inside the boom. These models have a box-welded frame to meet heavy duty cycles and offer a high ground clearance, with a bottom plate along the entire length to protect vital parts. The all-round panoramic visibility is provided by the patented asymmetric cab with ROPS/FOPS Level 2 protection and a pillar-less rear window. Additionally, they offer efficient, simple and safe



Photo Credit: Bobcat

Bobcat offers tyre options for the different types of surfaces encountered at waste and recycling sites.

operation with an intuitive, variable transmission and an automatic parking brake for enhanced safety and operator convenience. Loading and handling work modes are standard as is the eco mode, which maintains optimum hydraulic performance without using the engine's full power.

The ability to carry, lift and place materials, such as bales or bulk material or load high-sided trailers and hoppers, offers advantages for a different waste and recycling sectors. Bobcat offers tyre options for the different types of surfaces encountered at waste and recycling sites.

These include the Michelin 460/70R24 BIBLOAD, which provides resistance to wear and tear and a smooth ride. The Nokian 480/65R24 Tri Steel tyre offers enhanced puncture resistance. The Camso TLH 792S 13 R24 is a solid tyre with optimised stability and durability. Equipped with this tyre, machines have maximum drive speeds held at 15 km/h.

PASCHAL unveils lightweight multi-waler

PASCHAL HAS PRESENTED the multi-waler at bauma 2019, which is used as an extension post and as universal waling.

With the new multi-waler, PASCHAL introduced a further development of the familiar combination rail to the market. The multi-waler can be used for stiffening a bracing of panels, for filler pieces and corners, as well as for stop ends and as a slab stop end bar.

At less than 17kg, the multi-waler aims to enable improved handling on the construction site. The separate clamping pieces ensure easier storage and transport, as the bars can be stacked next to and on top of each other, thus saving space.

"The multi-waler is not linked to a particular fastening piece, however, but instead can be combined using various fastening options, such



Photo Credit: Paschal

The new multi-waler – a lightweight

as LOGO clamping parts, waler supports or hook heads," according to the company.

Additionally, the new clamping parts are not linked to the multi-waler in their use. They are suitable for squared timbers with a height of 10 cm, which is set to be clamped onto the formwork.

Siemens Mobility, Softil for next-gen train communications

SIEMENS MOBILITY AND Softil have jointly announced an agreement that will see a range of next-generation communications solutions come to market for use in long term evolution-railway (LTE-R) railways as well as mission-critical push-to-talk (MCPTT) metro applications such as underground tram buses.

The mission-critical communications (MCX or MCC) enabler Softil aims to support the future railway mobile communications systems (FRMCS) of the International Union of Railways (UIC) to build a global rail traffic management system (GRTMS) for the entire rail industry.

"The rail industry is at the forefront of the mission-critical communication revolution and GSM-R based systems have already been replaced by LTE-R solutions in the Asia-Pacific (APAC) and the trend is expected to widen across other markets in 2019/20," said Pierre Hagendorf, CEO of Softil.

The new radio system for the railway industry aims to guarantee the interoperability with GSM-R while delivering on these three main areas—critical communications, performance communications and business communications.

"The rail industry is facing unprecedented challenges in handling increasing numbers of passengers and freight traffic loads," noted Russell Clarke, general manager, mobile communications



The initiative aims to support the future railway mobile communications.

Photo Credit: Sailor/Adobe Stock

at Siemens Mobility.

LTE-R is the foundation for the railway variant of the 3GPP MCC over LTE/5G (MCPTT) standard. What sets the LTE-R technology apart from the currently used GSM-R is that it uses the full power of broadband networks including voice, video, text, images and location.

The Softil BEEHD framework is LTE-R compatible and set to enable Siemens Mobility's solutions to deliver stable voice as well as data communications on trains running at speeds in excess of 400km per hour.

LTE-R technology makes it possible to live-track trains and transmit railroad information to engine drivers, as well as enabling multimedia-based group calling and SMS services on top of voice call services.

Additionally, real-time group/individual communication is made possible between train engineers and control centres.

Roadtec unveils RP-250e for asphalt paving

THE RP-250E'S DIAMOND tread tyres and adjustable suspension provide improved weight distribution. The large tyres enable increased surface contact, traction, and flotation without the increased costs associated with a tracked paver. This adaptable suspension enables the vehicle to easily tackle hefty loads at the screed.



The RP-250e is designed for tough jobs.

Photo Credit: Roadtec

move out beyond the sides of the machine to give the operator a better view down the sides of the machine. The adjustable operator seats feature a ride control tension system for ultimate comfort.

Since it can travel over the road, it is easily transported to and from the jobsite, without requiring a trailer, as tracked machines do. Tracked pavers are more expensive to maintain, as there are more parts to care for and replace. With the RP-250e, operators have the benefits of tracks without the cost or maintenance.

The RP-250e features Roadtec's exclusive anti-segregation design of the feed tunnel, the feed tunnel discharge, and the rear augers.

The RP-250e's augmented steering gives operator precise control in turning. The turn radius is tight which provides increased control. Steering is driven by the rear wheels, and oil is distributed as needed, rather than evenly. It can redirect flow to the drive wheels for power-assisted turning.

The machine is designed for tough jobs but still provides a comfortable, safe ride. Seats of the dual operator stations can

Perkins Ecoplus oil filters enable a quick and clean change

PERKINS HAS EXTENDED its Perkins Ecoplus range of filters with the addition of a redesigned oil filter.

The Perkins Ecoplus oil filter has been fitted on the new EU Stage V Perkins Syncro 3.6 and 2.8 litre engines. The company has upgraded the filter as part of the design work undertaken on the new engine range.

As with all Perkins Ecoplus filters, the oil filter includes a replaceable element that fits inside the filter housing on the machine. This reduces waste as there is no metal canister to dispose of, compared to the typical spin-on filter. The new filter is upright which makes it easier to access and as soon as the cap is opened the oil automatically drains back into the block. Matt O'Sullivan, aftermarket general manager, said, "You just unscrew the top cover using the 38 mm nut – no special tooling is required, lift out the cap and element and click the new filter back in place. It's as simple as that." To maintain the integrity of the filter, Perkins has used quality media inside the filter for efficient protection.

BKT launches new size of EARTHMAX SR 423 for tipper trucks

BKT HAS LAUNCHED the new size 12.00 R24 of Earthmax SR423 tyre at Automechanika. The tyre is specifically designed for tipper trucks and dumpers operating both on and off the road in the Middle East.

The tyre is available in two other sizes 10.00 R20 and 11.00 R20, which are developed for tipper trucks and dumpers employed in mining and transport operations under demanding conditions. The tread pattern, with non-directional lugs, provides traction on any terrain. The large shoulder minimises the risk of cuts and chips, and on adverse and inaccessible paths. The all-steel casing structure provides resistance and durability leading to a longer product life-cycle. The reinforced bead makes it suitable for heavy-duty service applications as well as increased load capacity.

Construction Buyers' Guide

2019

The Middle East's annual where-to-buy guide

Section One: Listings by category

Section Two: Suppliers of construction & mining equipment and services

Section Three: Contact details of Middle East agents & subsidiaries listed by country

Section One: Listings by category

AIR COMPRESSORS

Cummins Middle East FZE
Doosan Portable Power
Gardner Denver FZE
General Navigation and
Commerce Co. (GENAVCO) LLC
Rotair Spa
Sullivan-Palatek, Inc.

Diesel Driven

Aggreko Middle East Ltd.
Doosan Portable Power
FG Wilson
Perkins Engines Co. Ltd.
Rotair Spa

Electric

Aggreko Middle East Ltd.
COELMO spa
Marelli Motori S.p.A.

Petrol Driven

Rotair Spa

AIR CONDITIONING

Aggreko Middle East Ltd.

ALTERNATORS FOR GENSETS

Linz Electric S.p.A.

BUILDINGS

COELMO spa
INMESOL, S.L.

COMPONENTS AND SPARE PARTS

COELMO spa
Gardner Denver FZE
Liebherr-Export AG
Marelli Motori S.p.A.
Marini S.p.A.
WIRTGEN GROUP, Branch of
John Deere GmbH & Co. KG

CONCRETE EQUIPMENT

Liebherr-Export AG
Sullivan-Palatek, Inc.
Wacker Neuson Aftermarket &
Services GmbH – Dubai Branch
/Representative Office

Batching Plant

Parker Plant Ltd.

Breakers

Bobcat
Doosan Portable Power
Okada Aiyon Corporation

Concrete Equipment - Other

Bobcat
Doosan Portable Power

Weckenmann Anlagentechnik
GmbH & Co. KG

Formwork

Herrenknecht AG
PASCHAL-Werk G. Maier GmbH
PERI
RMD Kwikform UAE
Weckenmann Anlagentechnik
GmbH & Co. KG

Mobile Mixing Plant

Parker Plant Ltd.

Pipe Making Equipment

MB Crusher

Recycling

CDE Global
Liebherr-Export AG

Reinforcement

International Trade Solutions (FZE)

CONSTRUCTION VEHICLES

Goldhofer AG
Haulotte Middle East FZE
Liebherr-Export AG
Perkins Engines Co. Ltd.

Construction Vehicles - Other

Haulotte Middle East FZE
Liebherr-Export AG

Dump Trucks and Haulers

Balkrishna Industries Ltd. (BKT)

Engines, Components and Accessories

COELMO spa
Jubaili Bros
Perkins Engines Co. Ltd.
Weichai Middle East FZE

Tractors

Goldhofer AG

Trailers

Goldhofer AG

CONSULTANCY SERVICES

Cummins Middle East FZE

DEMOLITION EQUIPMENT

Bobcat
Doosan Portable Power
Liebherr-Export AG
MB Crusher
Okada Aiyon Corporation
Sullivan-Palatek, Inc.
Wacker Neuson Aftermarket &
Services GmbH – Dubai Branch
/Representative Office

DRILLING

Sullivan-Palatek, Inc.

Drilling Machinery and Plant

Herrenknecht AG

Drilling - Other

Doosan Portable Power

Tunnelling

CDE Global
Herrenknecht AG
Liebherr-Export AG

EARTHMOVING EQUIPMENT

Bobcat
Liebherr-Export AG
MB Crusher
Perkins Engines Co. Ltd.
Wacker Neuson Aftermarket &
Services GmbH – Dubai Branch
/Representative Office

Attachments and Accessories

Bobcat
MB Crusher
Okada Aiyon Corporation

Backhoe Loaders

Balkrishna Industries Ltd. (BKT)
Bobcat

Dozers

General Navigation and
Commerce Co. (GENAVCO) LLC
Liebherr-Export AG

Dumpsters

Kaesar Kompressoren FZE
Liebherr-Export AG

Earthmoving Equipment - Other

Bobcat
General Navigation and
Commerce Co. (GENAVCO) LLC
Liebherr-Export AG
Okada Aiyon Corporation

Excavators

Bobcat
General Navigation and
Commerce Co. (GENAVCO) LLC
Kaesar Kompressoren FZE
Liebherr-Export AG
Yanmar Europe B.V.

Loaders - Other

Bobcat
General Navigation and
Commerce Co. (GENAVCO) LLC
Kaesar Kompressoren FZE
Liebherr-Export AG
Yanmar Europe B.V.

Mini-Excavators

Bobcat
Kaesar Kompressoren FZE
Liebherr-Export AG

Motor Graders

Balkrishna Industries Ltd. (BKT)

Skidsteer Loaders

Balkrishna Industries Ltd. (BKT)
Bobcat

FINISHING

Conren Ltd.

Equipment

CDE Global
Jubaili Bros

Materials

Tremco- illbruck LLC

Services

PASCHAL-Werk G. Maier GmbH

LIFTING EQUIPMENT

Haulotte Middle East FZE
Hi-Force Ltd.
Liebherr-Export AG
Perkins Engines Co. Ltd.

Access

Haulotte Middle East FZE

Components and Accessories

Hi-Force Ltd.

Cranes

Balkrishna Industries Ltd. (BKT)
Liebherr-Export AG

Hoists

Liebherr-Export AG

Hydraulic

Hi-Force Ltd.

Jacking Equipment

Hi-Force Ltd.

Lift Trucks

General Navigation and
Commerce Co. (GENAVCO) LLC

Mechanical

Hi-Force Ltd.

Pneumatic

Doosan Portable Power

Telescopic Handlers

Bobcat
Haulotte Middle East FZE

MOBILE POWER SUPPLY UNITS

Aggreko Middle East Ltd.
Cummins Middle East FZE
Doosan Portable Power
FG Wilson
INMESOL, S.L.
Jubaili Bros
Linz Electric S.p.A.
SAB, Standard Aggregatebau
Evers GMBH & CO. KG
Visa S.p.A.
Weichai Middle East FZE

OTHER SITE EQUIPMENT AND MATERIALS

Bobcat
COELMO spa
Conren Ltd.
Cummins Middle East FZE
Doosan Portable Power
FG Wilson

Fencing

International Trade Solutions
(FZE)

Lighting Masts/Towers

Doosan Portable Power
INMESOL, S.L.
Jubaili Bros
SAB, Standard Aggregatebau
Evers GMBH & CO. KG
Visa S.p.A.
Wacker Neuson Aftermarket &
Services GmbH – Dubai Branch
/Representative Office
Yanmar Europe B.V.

Sand Blasting Equipment

Doosan Portable Power
Rotair Spa

Scaffolding

PASCHAL-Werk G. Maier GmbH
PERI
RMD Kwikform UAE
Wilhelm Layher GmbH & Co KG

Welding Equipment

INMESOL, S.L.
International Trade Solutions
(FZE)
Linz Electric S.p.A.

PUMPING EQUIPMENT

Visa S.p.A.

Concrete

Liebherr-Export AG

Crushing, Screening and Washing

CDE Global
MB Crusher
McCloskey International Ltd.
Parker Plant Ltd.
WIRTGEN GROUP, Branch of
John Deere GmbH & Co. KG

Pumping Equipment - Other

Yanmar Europe B.V.

Quarrying

CDE Global
Doosan Portable Power
Liebherr-Export AG

RENTAL EQUIPMENT

Aggreko Middle East Ltd.
Cummins Middle East FZE
FG Wilson
Herrenknecht AG
Hi-Force Ltd.
INMESOL, S.L.
Jubaili Bros
Peter Berghaus GmbH
RMD Kwikform UAE
Rotair Spa
Visa S.p.A.

ROAD BUILDING EQUIPMENT

Bobcat
Doosan Portable Power
Gardner Denver FZE

Liebherr-Export AG
WIRTGEN GROUP, Branch of
John Deere GmbH & Co. KG

Asphalt Plant

Marini S.p.A.
Parker Plant Ltd.

Compaction Equipment

Doosan Portable Power
Wacker Neuson Aftermarket &
Services GmbH – Dubai Branch
/Representative Office
Weckenmann Anlagentechnik
GmbH & Co. KG

Recycling

Marini S.p.A.
MB Crusher

Road Building Equipment - Other

Bobcat
Doosan Portable Power
Marini S.p.A.
Peter Berghaus GmbH
Rotair Spa

Road Marking

Peter Berghaus GmbH
Rotair Spa

SOFTWARE

PASCHAL-Werk G. Maier GmbH

TOOLS

Conren Ltd.
Doosan Portable Power
Gardner Denver FZE

Hi-Force Ltd.
Sullivan-Palatek, Inc.

Hydraulic

Hi-Force Ltd.

Mechanical

Hi-Force Ltd.

Pneumatic

Doosan Portable Power
Hi-Force Ltd.

Tools - Other

Hi-Force Ltd.

USED EQUIPMENT

Herrenknecht AG
Visa S.p.A.

Section Two: Suppliers of construction & mining equipment and Services**Aggreko Middle East Ltd.**

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Aggreko has grown to become the world's leading provider of rental power and temperature control solutions and offers round-the-clock service, support and equipment availability in the Middle East through a network of twelve locations. Aggreko serves a diverse market from construction sites to quarrying, oil and gas to refineries and events.

Balkrishna Industries Ltd. (BKT)

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BKT is one of the global leaders in the 'off highway' tires segment which includes Industrial & Construction, Earthmoving, Agriculture and Lawn & Garden application. For more details, please visit the website www.bkt-tires.com

Bobcat

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Bobcat manufactures the widest range of market-leading compact equipment including skid-steer and compact tracked loaders, compact excavators, backhoe loaders and telescopic handlers. The impressive selection of Bobcat attachments for use with these machines includes wheel saws, trenchers, planers, hydraulic breakers and graders, saving time, effort and cost in carrying out an increasing range of applications in the Middle East.

Agents:

Bahrain - Yusuf Bin Ahmed Kanoo Co. WLL
Egypt - Otrac Heavy Equipment
Iraq - Vara Company for General Trading LTD
Jordan - Arab Equipment Trading Co. (Bobcat)
Kuwait - Bahrah Trading Co. WLL
Lebanon - Tracksparco Ltd.
Libya - Danah for Import of Road Equipment and Heavy Machinery LLC
Oman - International Heavy Equipment LLC
Saudi Arabia - General Trading & Equipment
United Arab Emirates - Kanoo Machinery LLC
Yemen - Blue Triangle Trading LTD

Caterpillar Inc

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61629, USA

Web: www.cat.com/demancat

With the industry's widest range of diesel, gas and rental generator sets, automatic transfer switches, Solar, Microgrid & Energy Storage, and switchgear, Caterpillar® is ready to help you design a system to your specifications and stand by your side for the life of your equipment. Find your dealer at: <https://www.cat.com/dealer>

Agents:

United Arab Emirates - Caterpillar SARL Branch

CDE Global

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CDE is a leading provider of wet processing equipment for quarries, mines and recycling operations on the global market. The CDE equipment range has applications across a wide range of materials and is delivering significant efficiencies in the construction and recycling, mining, industrial sands and environmental sectors. Working across 5 sectors and 8 regions globally, CDE has been co-creating with customers for over 25 years to deliver collaborative, imaginative and unique processing systems.

COELMO spa

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Coelmo is one of the oldest European manufacturers of industrial and marine generators from 3kVA up to 4000kVA. Based in Italy, with a large stock of generating sets available to be shipped overnight to any destination in the world. Company profile, products and models are available online at www.coelmo.it

Agents:

United Arab Emirates - COELMO (DMCC Branch)

Conren Ltd.

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Established in 1971 Conren are UK manufacturers and exporters of construction materials including waterproofing membranes, epoxy resin coatings and screeds, anti-skid resins for highways and external decorative resin bound and bonded surfacing.

Agents:

United Arab Emirates - Al-Shirawi Contracting Co. LLC

Controls S.P.A

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Fax: +39 02 92103333
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Testing Equipment for the Construction Industry

Cummins Middle East FZE

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Cummins Inc., a Fortune 500 Company, designs, manufactures and services diesel and alternative fuel engines from 2.8 to 95 liters, diesel and alternative-fueled electrical generator sets from 2.5 to 3,750 kVA, as well as related components and technology. Cummins serves customers through a network of 500 company-owned and independent distributor facilities and more than 6,000 dealer and distributor locations in over 190 countries. Cummins presence in the Middle East began in 1956 and now spans 14 countries - UAE, Bahrain, Yemen, Oman, Saudi Arabia, Kuwait, Jordan, Iraq, Lebanon, Afghanistan and Pakistan.

Doosan Portable Power

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Doosan Portable Power is a market leading manufacturer of portable compressors, generators and mobile lighting systems for the Middle East market. All Doosan Portable Power products are designed and rigorously tested to ensure they give outstanding operation on the toughest sites and in the most extreme conditions around the world, for applications in construction, roads, utilities, rental, quarrying and many other industries.

Agents:

Bahrain - Mohammed Jalal & Sons WLL
Egypt - Otrac Heavy Equipment Co. (Doosan Portable)
Egypt - Triangle Heavy Equipment
Ethiopia - My Wish Enterprises PLC
Iraq - Tristar Co. Iraq
Jordan - Toolbox
Kuwait - Bahrah Trading Co. WLL
Lebanon - Tracksparco Bachalani SARL
Libya - Gunny Oilfield Services
Mauritius - Prime Plant Company Limited
Saudi Arabia - Saudi Diesel Equipment
Saudi Arabia - The Machinery Group LLC
United Arab Emirates - Al Futtaim Auto & Machinery Co. LLC
United Arab Emirates - Saudi Diesel Equipment
Yemen - Blue Triangle Trading LTD

FG Wilson

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For 50 years, FG Wilson has been a leading manufacturer of diesel and gas generator sets from 6.8 to 2,500kVA and beyond. Since 1990 alone, we have installed 640,000 generator sets, supported by over 300 distributors, offering world-class levels of service from product selection to installation and lifetime support.

Gardner Denver FZE

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For more than 155 years, Gardner Denver has been a leading global provider of compressors,

blowers and vacuum pumps. With global teamwork, strong customer focus, and vast application knowledge, our brands provide reliable, energy-efficient products that serve a wide range of manufacturing and process industries.

General Navigation and Commerce Co. (GENAVCO) LLC

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GENAVCO LLC, a member of the Juma Al Majid Group, has H.O in Dubai and branches in Abu Dhabi & Sharjah, dealing with Isuzu Commercial Vehicle, British petroleum (BP) Lubricants, Voge Asphalt Pavers, JLG Aerial Work Platform, Kleemann & Terex Crushing and Screening Equipment, Wirtgen Road Milling & Recycling machines, Benninghoven Asphalt Plants, Hamm Rollers, Liebherr Earthmoving Equipment, Allison Transmission, SDMO Diesel Generators, Boge Stationary & compAir Portable Air Compressors, Crown Electric Forklifts, Flexi Articulated Lift Trucks and Shantui Earthmoving Equipment in the U.A.E.

Goldhofer AG

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Goldhofer manufactures transport vehicles with payloads extending from 25 to over 15,000 tons. The product range covers different product line: trailers (steered and unsteered), semitrailers (steered and unsteered, with/without dropdeck/flatbed, 2 to 12 axles, payloads up to approx. 150 tons), heavy duty modules (for voluminous and heavy loads, combinable longitudinal/transersal, payloads up to 15,000 tons, can be equipped with hydrostatic drive), transport vehicle for wind power plants.

HAMM AG

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Haulotte Middle East FZE

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With more than one hundred years of experience Haulotte is positioned as the European leader and number 3 in the world

today in the field of people and material lifting equipment. Haulotte improves its international sales network in order to ensure quick and efficient service locally for a range of machines including more than 60 models:
Aerial work platforms
Telescopic handlers

Herrenknecht AG

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Fax: +49 7824 3403
Web: www.herrenknecht.com
E-mail: pr@herrenknecht.com

Herrenknecht is a technology and market leader in the area of mechanized tunnelling systems. As the only company worldwide, Herrenknecht delivers cutting-edge tunnel boring machines for all ground conditions and in all diameters - ranging from 0.10 to 19 meters.

Agents:

United Arab Emirates - Herrenknecht Middle East FZE

Hi-Force Ltd.

Prospect Way
Daventry
Northants
NN11 8PL
United Kingdom
Tel: +44 1327 301000
Fax: +44 1327 706555
Web: www.hi-force.com
E-mail: daventry@hi-force.com

Hi-Force is the UK's leading manufacturer and supplier of hydraulic tools and bolting equipment, and offers a wide range of products suitable for use in several industries worldwide.

Agents:

Saudi Arabia - Jassem Ibrahim M. J Al Shikar Est.
United Arab Emirates - Ebrahim Al Shaker Industrial Equipment Trading LLC
United Arab Emirates - Hi-Force FZCO
United Arab Emirates - Hi-Force Hydraulics

INMESOL, S.L.

Ctra. Fuente Alamo, 2
Corvera
Murcia
30153
Spain
Tel: +34 968 380300
Web: www.inmesol.com
E-mail: inmesol@inmesol.com

Manufacturer of generator sets, lighting towers, parallel systems, and gen sets for hybrid electric power generation systems.

With more than 25 years in the market, INMESOL S.L. is a Spanish company that designs, manufactures, markets and provides technical support service for technologically leading gensets, in both open and soundproofed versions and from 2.5 to 2,500 kVA (PRP), lighting towers, and parallel systems.

INMESOL's highly specialised technical team enables it to meet specific requirements from the most demanding markets, offering optimal solutions for each one of them. It is currently present in more than 80 countries around the world, with equipment installed in all types of applications and uses.

International Trade Solutions (FZE)

Jumeriah Islands
Dubai
United Arab Emirates
Tel: +971 52 9373222
Web: www.itsoalae.com
E-mail: graham@cliffeng.com

John Deere Power Systems

Orléans - Saran Unit
1 rue John Deere
Fleury les Aubrais Cedex
45401
France
Tel: +33 2 38826119
Fax: +33 2 38846266
Web: www.JohnDeere.com
E-mail: jdengine@JohnDeere.com

John Deere Power Systems develops, manufactures and markets diesel engines for a large variety of industrial and agricultural applications, material handling equipment, compressors and generator sets.

Agents:

Egypt - Orascom Trading SAE
Lebanon - Allied Diesel S.A.R.L.
Lebanon - Ghaddar Machinery Co.
Oman - General Engineering Services Est
Saudi Arabia - Electrical Work & Maintenance
Turkey - AKSA Servis Ve Yedek Parca AS
United Arab Emirates - GENAVCO
Yemen - Abu Alrejal Trading Corporation

Jubaili Bros

Jebel Ali Free Zone
United Arab Emirates
Tel: +971 4 8832023
Fax: +971 4 8832053
Web: www.jubailibros.com
E-mail: jbdubai@jubailibros.com

Jubaili Bros has over 40 years of experience and is a leading provider of Power Solutions in the Middle East, Africa and Asia. Jubaili Bros serves its customers by offering high quality diesel generator sets, assembled at 3 manufacturing plants with 29 branches and services centers deployed in 9 countries that are dedicated to customer satisfaction.

Agents:

Kuwait - Jubaili Bros (Kuwait)
Lebanon - Jubaili Bros (Lebanon)

Kaeser Kompressoren FZE

PO Box 17485
Street N203
Jebel Ali Free Zone (North)
Dubai
United Arab Emirates
Tel: +971 4 8050000
Fax: +971 4 8050077
Web: www.kaeser.com
E-mail: info.dubai@kaeser.com

Manufactures of industrial air compressors, construction type air compressors as well as industrial low pressure blowers, together with associated accessories such as air treatment equipment and centralised control systems.

Liebherr-Export AG**LIEBHERR**

General-Guisan-Straße 14
Nussbaumen
5415
Switzerland
Web: www.liebherr.com
E-mail: info.lex@liebherr.com

The Liebherr Group comprises more than 130 companies in every continent of the world and employs a workforce of more than 46,000 people. In 2018, the Liebherr Group achieved a total consolidated turnover of more than 10.5 billion Euros. The Liebherr Group's Holding Company is Liebherr-International AG in Bulle, Switzerland, which is entirely owned by members of the Liebherr family.

Linde AG

Linde AG, Engineering Division
Dr.-Carl-von-Linde-Str. 6-14
Pullach
82049
Germany
Tel: +49 89 74450
Fax: +49 89 74454908
Web: www.linde-engineering.com/en/contact/index.html

Linz Electric S.p.A.

Viale del Lavoro, 30
Arcole (VR)
37040
Italy
Tel: +39 045 7639201
Fax: +39 045 7639202
Web: www.linzelectric.com
E-mail: info@linzelectric.com
Linz Electric S.p.A. is specialized in the production of alternators from 1.7 kVA up to 1500 kVA and rotating welders up to 500Amps. The main focus of Linz Electric is the customer's satisfaction through the top product quality, quick and complete service.

Marelli Motori S.p.A.

Via Sabbionara 1
Arzignano (VI)
36071
Italy
Tel: +39 0444 479711
Fax: +39 0444 479888
Web: www.marellimotori.com
E-mail: sales@marellimotori.com
Marelli Motori designs and manufactures a wide range of generators and electric motors in low, medium and high voltage (up to 15 kV), 50-60 Hz or suitable for variable speed operation. Generators up to 12,500 kVA. Motors up to 10,000 kW.

Agents:
United Arab Emirates - Marelli Motori Middle East

Marini S.p.A.

Via Roma, 50
Alfonsine (RA)
44011
Italy
Tel: +39 0544 88111
Fax: +39 0544 81341
Web: www.marini.fayat.com
E-mail: info@marini.fayat.com

MARINI is a worldwide leader in the manufacture of stationary and mobile batch asphalt plants (production up to 500 t/h). MARINI plants produce low-energy asphalt using up to 100% of RAP. The result of the most modern technologies and 120 years of experience Made in Italy.

Agents:
Egypt - M.S.E. - Modern Structures & Equipment
Kuwait - Teknoline Group
Oman - Saud Bahwan Projects & Equipment LLC
Turkey - Marini Makina AS
United Arab Emirates - Fayat Middle East FZE

MB Crusher

Via Astico 30/A
Fara Vicentino (VI)
Italy
Tel: +39 0445 308148
Fax: +39 0445 308179
Web: www.mbcruiser.com
E-mail: info@mbcrusher.com

Italian company MB Crusher manufactures attachments for excavators and loaders for the recovery and recycling of inert waste at low costs and with minimal environmental impact. MB Crusher machines make it easy to complete the recycling cycle directly on site, simplifying the operations of crushing, screening and handling of materials.

McCloskey International Ltd.

47 Moor Road
Coalisland, Co. Tyrone
Northern Ireland
BT71 4QB
Ireland
Tel: +44 28 87740926
Fax: +44 28 87747242
Web: www.mccloskeyinternational.com
E-mail: salesuk@mccloskeyinternational.com

McCloskey International leads the crushing and screening industry, with production facilities in Canada (H/O) and Northern Ireland. Our product line includes Jaw, Cone, Impactor and VSI Crushers, High Energy Vibrating Screeners and Scalpers, Washing Systems, Trommel Screeners & Stackers.

Agents:
Bahrain - Aggregate Processing & Recycling Ltd. (BAH)
UAE - Aggregate Processing & Recycling Ltd. (UAE)

Okada Aiyon Corporation

4-1-18, Kaigan-dori
Minato-ku
Osaka
552-0022
Japan
Tel: +81 6 65761268
Fax: +81 6 65761516
Web: www.okada-aiyon.com

Parker Plant Ltd.

Canon Street
Leicester
LE4 6GH
United Kingdom
Tel: +44 116 2665999
Fax: +44 116 2610812
Web: www.parkerplant.com
E-mail: info@parkerplant.com

Established for over 100 years, Parker Plant has gained an enviable reputation from its huge wealth of practical experience for technical ability, quality and reliable performance to become one of the foremost providers of dependable solutions for crushing, screening, concrete & asphalt plants along with bitumen surfacing applications worldwide.

PASCHAL-Werk G. Maier GmbH

Kreuzbühlstraße 5
Steinach
77790
Germany
Tel: +49 7832/71-0
Fax: +49 7832/71-209
Web: www.paschal.com
E-mail: service@paschal.de

In over 40 countries PASCHAL-Group is an internationally well-known provider for services, distribution and production of concrete formwork, supporting systems and formwork planning software. Our portfolio includes the circular formwork TTR/TTS, Modular Universal Formwork with large-size elements GE, the large-size formwork LOGO.3, column formwork, climbing and single-sided forming and supporting systems.

Agents:
Saudi Arabia - PASCHAL-Werk G. Maier GmbH (Scientific and Technical Office)

PERI L.L.C

PO Box 27933
Palace Towers, 24th floor
Silicon Oasis, Dubai
United Arab Emirates
Tel: +971 4 3262992
Fax: +971 4 3262993
Web: www.peri.ae
E-mail: perillc@peri.ae

Perkins Engines Co. Ltd.

Frank Perkins Way
Peterborough
Cambridgeshire, PE1 5FQ
United Kingdom
Tel: +44 1733 583000
Web: www.perkins.com

A world-leading supplier of off-highway diesel engines in the 4-2000kW market, Perkins has 85+ years' experience of designing, building and servicing industrial power solutions. Working in collaboration with 800+ equipment manufacturers in the construction, agricultural and power generation markets, we tailor our engines to meet their needs and exacting standards.

Agents:
United Arab Emirates - Power Systems Gulf LLC (Perkins Engines)

Peter Berghaus GmbH

Herrenhoehe 6
Kuerten
51515
Germany
Tel: +49 2207 96770
Fax: +49 2207 967780
Web: www.berghaus-verkehrstechnik.de
E-mail: mail@berghaus-verkehrstechnik.de

Peter Berghaus GmbH - Well known manufacturer of innovative safety products for working zones from Germany. Portable traffic lights, mobile barrier systems, warning lights and warning trailers - All you need for safety on your road construction site.

RMD Kwikform UAE

PO Box 5801
Sharjah
United Arab Emirates
Tel: +971 6 5534173
Fax: +971 6 5534327
Web: www.rmdkwikform.com
E-mail: rmd.uae@rmdkwikform.com

Rotair Spa

Via Bernezzo, 67 12023
12023
Caraglio (CN)
Italy
Tel: +971 50 2600 482
Fax: +971 6 557 9980
Web: www.rotairspa.com
E-mail: jayanthan@rotairspa.com
ROTAIR S.p.A is an Italian manufacturer of Portable Screw Air Compressors. Since its inception in 1961, the company is specialized in design and manufacturing of highly efficient and reliable screw compressors. Today ROTAIR compressors are supporting customers in 70+ countries to meet their demanding business needs in the most efficient way. Product range: 25 – 900 CFM / 7 – 14 bar Aired: Manufactured in-house Engines used: Perkins-UK, Kubota-Japan, Honda-Japan, Deutz-Germany and Cummins-UK Version: Diesel, Petrol and Hydraulic

SAB, Standard Aggregatebau Evers GmbH & Co. KG

Oststraße 11
D-22844 Norderstedt, Germany
Tel: +4940/ 522 20 110
Fax: +4940/ 522 11 44
Web: www.generatingset.com
E-mail: info@generatingset.com

Reputable German manufacturer of custom-built diesel-driven generating sets from 50 to 8000 kVA in stationary, transportable or mobile executions for standby, peak load or base load applications world-wide. Main competencies are the planning, designing, manufacturing, installation and servicing of global plant constructions under consideration of individual customer and project requirements.

SSAB

Middle East head office and stock area is in Sharjah, Hamriyah Free Zone United Arab Emirates
Tel: +971 6 5263249
Web: www.ssab.com
E-mail: support.me@ssab.com

SSAB is a Nordic and US-based steel company. SSAB offers value added products and services developed in close cooperation with its customers to create a stronger, lighter and more sustainable world. SSAB has production facilities in Sweden, Finland and the US. SSAB's 2 main product brands: Hardox® wear plate and Strenx™ Performance Steel

SSAB - Hardox®

Middle East head office and stock area in Sharjah, Hamriyah Free Zone United Arab Emirates
Tel: +971 6 5263249
Web: www.ssab.com
E-mail: support.me@ssab.com

High performance steel for load carrying structures like trailer chassis, cross-members and booms of cranes. Dimensions available from 0.7mm to 160mm in thickness, and with yield strengths ranging from 600 to 1300 MPa. It has excellent toughness even in a cold climate, excellent workshop properties and superior consistency with warranties.

SSAB Swedish Steel FZE

Sharjah, PO Box 49925, Sharjah, UAE
Tel: +971 6 5262349
Fax: +971 6 5262935
Web: www.ssab.com
E-mail: info@ssab.com

Sullivan-Palatek, Inc.

1201 West US Highway 20
Michigan City, IN, 46360, USA
Tel: +1 219 8742497
Fax: +1 219 8090203
Web: www.sullivan-palatek.com
E-mail: info@palatek.com

Sullivan-Palatek Inc., a leader in innovation and design, offers the industry's widest range of electric and portable rotary screw air compressors. From humble beginnings in 1984, Sullivan-Palatek has grown from providing engineering services to existing

clients, to a privately owned company that manufactures the most rugged and reliable machinery available in the market.

Agents:
United Arab Emirates - Sullivan-Palatek, Inc.

Teksan Jenerator Elektrik Sanayi ve Ticaret AS

Yenidogan Mah. Edebalı Cd. No: 12
Sancaktepe, 34791, Turkey
Tel: +90 216 3120550
Fax: +90 216 3126909
Web: www.teksan.com
E-mail: denizar@teksan.com

Agents:
Egypt - Rich Uni (Triangle)
Iraq - KM Company
Libya - Belhaj International Company
Saudi Arabia - ABDUL LATIF JAMEEL MACHINERY
Sudan - MTWA International

tremco illbruck LLC

Dubai Silicon Oasis
Headquarter Building,
Unit C84 4th/F, West Wing
Dubai, United Arab Emirates
Tel: +971 4 3724550
Fax: +971 4 5015777
Web: www.tremco-illbruck.com
E-mail: leonor.lim@tremco-illbruck.com

tremco illbruck is a European manufacturer and service provider of high-performance sealing, bonding, flooring, waterproofing, and passive fire protection for the construction and manufacturing industries. We provide a broad range of reliable products and services under our product brands: illbruck, TREMCO, Nullifire and PACTAN. With nearly 80 years experience, we have an unrivalled understanding of our customer's business. Our local presence means we are on the ground daily, helping our customers make the most of our products and responding rapidly to their questions. We understand specific local markets, standards and regulations, and actively incorporate customer feedback. Our tailored solutions ensure our customers success in every project. tremco illbruck was created from the merger of tremco's European Sealant and waterproofing Division with illbruck Sealant Systems in September 2005. Tremco's net revenue were \$435M in 2013. Employs 1,100 people in 25 countries worldwide.

The powerful combination gives tremco illbruck a leadership position in the sealants, bonding, flooring, waterproofing and passive fire protection markets throughout Europe, Middle East and Africa.

Visa S.p.A.

Via 1° Maggio, 55
Fontanelle (TV), 31043, Italy
Tel: +39 0422 5091
Fax: +39 0422 509350
Web: www.visa.it
E-mail: visa@visa.it

Visa S.p.A is one of the world's leading genset suppliers, based in Italy, designing and manufacturing diesel gensets, from 9 to 3000 kVA, in standard or customized versions for a large variety of applications. It also provides

specific equipment for the construction sector (such as mobile site pumps for dewatering and sewage). It is present in over 80 countries through a global network to support in the successful completion of projects through an efficient engineering department, guaranteeing a highly operational flexibility and qualitative standards for which it has become a leader in the market for more than 50 years.

Wacker Neuson Aftermarket & Services GmbH – Dubai Branch /Representative Office

PO Box 57198
Sama Tower Office 803B
Sheikh Zayed Road, Dubai, UAE
Tel: +971 4 3888930
Fax: +971 4 3888940
Web: www.wacker-neuson.ae
E-mail: info-me@wackerneuson.com

Wacker Neuson—all it takes! Wacker Neuson makes this promise to customers worldwide with a comprehensive product range of construction equipment and compact machines, spare parts and services. Among other things, the product portfolio includes internal and external vibrators, trowels and vibratory screeds, rammers, vibratory plates and rollers, demolition equipment, excavators, wheel loaders, telehandlers, and dumpers.

Weckenmann Anlagentechnik GmbH & Co. KG

Birkenstraße 1, Dormettingen
72358, Germany
Tel: +49 7427 94930
Fax: +49 7427 949329
Web: www.weckenmann.com
E-mail: info@weckenmann.de

Weckenmann, Germany is global leader in planning and construction of precast concrete plants. The company's products include the setting up of turnkey plants, pallet circulation systems, tilting tables, battery moulds and shuttering systems. Weckenmann offers valuable support services including factory planning and design, factory management support, feasibility studies and more.

Agents:
United Arab Emirates - GPE German Plant Experience LLC

Weichai Middle East FZE

PO Box 18698, Plot No S10411
Jebel Ali Free Zone, Dubai, UAE
Tel: +971 4 8810650
Fax: +971 4 8810651
Web: www.weichai.com
E-mail: zhonglei@weichai.com

Wilhelm Layher GmbH & Co KG

PO Box 40, Gueglingen - Eibensbach
74361, Germany
Tel: +49 71 35700
Fax: +49 71 3570265
Web: www.layher.com
E-mail: info@layher.com

Layher is the world's leading manufacturer of scaffolding and protective systems. For more

than 70 years the Layher brand has been synonymous with proven safety, ground-breaking innovation, exceptional quality and complete dependability. With its global presence, Layher can make its expertise and experience available wherever they are needed.

Agents:
United Arab Emirates - Advanced Scaffold Trading LLC - Member of Layher Group
United Arab Emirates - Layher FZE

WIRTGEN GROUP, Branch of John Deere GmbH & Co. KG

Reinhard-Wirtgen-Straße 2
Windhagen
53578
Germany
Tel: +49 26 451310
Fax: +49 26 45131392
Web: www.wirtgen-group.com
E-mail: info@wirtgen.de

The WIRTGEN GROUP is an internationally active group of companies in the construction equipment industry, comprising the brands Wirtgen, Voegelé, Hamm, Kleemann and Benninghoven. Products include cold milling machines, recyclers, slipform pavers, surface miners, asphalt pavers, rollers, crushers, screens, and asphalt mixing plants.

Agents:
Algeria - SARL Tractor Parts Services (T.P.S.)
Bahrain - Synergy International
Egypt - ACE Arabian Co. for Engineering
Iraq - Al-Ghalib Co. Ltd. (Wirtgen)
Jordan - The Near East Equipment Co. LLC
Kuwait - Al-Mahhar Al-Kuwaitiyya for Light and Heavy Equipment and Machines
Lebanon - Cyber Roads
Libya - WIRTGEN Libya J. C.
Morocco - SMDM - Société Marocaine de Distribution de Matériel
Oman - Saud Bahwan Automotive LLC
Saudi Arabia - Bakheet Co. for Machinery Ltd.
Saudi Arabia - Mohamed Saud Al-Subai Est.
Sudan - Tital Co. Ltd.
Syria - T.T.C. Technical Trading Center
Tunisia - SOTRADIES
Turkey - Wirtgen Ankara Makina Sanayi ve Ticaret Ltd. Sti.
United Arab Emirates - GENAVCO LLC
United Arab Emirates - Quarry Mining LLC (Stationary Equipment)
Yemen - AFCO for Heavy Equipment

Yanmar Europe B.V.

Brugplein 11
1332 BS, Almere
Netherlands
Tel: +31 36 54 93 200
Web: www.yanmarindustrial.eu
E-mail: industrial-yeu@yanmar.com

YANMAR is a global brand and leader in design & manufacturing of advanced performance diesel engines and final equipment for agricultural, construction, energy systems, industrial & marine applications.

Agents:
Algeria - Ferhah Motors
Angola - Anglobal
Bahrain - M. H. Al Mahroos BSC ©
Egypt - Ahmed Daoud
Kuwait - AL SULTAN & KHALAF
Lebanon - STAUNCH MACHINERY
Morocco - Dron Maroc
Oman - Oman Marketing and Services Company LLC
Saudi Arabia - Abdullah Hashim Co. Ltd.
Tunisia - Sotradies
United Arab Emirates - Al-Futtaim Auto & Machinery Co. LLC (FAMCO)

Section Three: Agents & subsidiaries in the Middle East

ALGERIA

Ferhah Motors

cit  les Mandarines lot n  01
Groupe 213
Mohammadia - Alger
Tel: +213661521662
Web: <https://www.ferhahmotors.com/>
E-mail: ferhahmotors@ferhahmotors.com

SARL Tractor Parts Services (T.P.S.)

Haouche Rane Laroussi Hamoud
Lot N 01
Khracia
Alger
Tel: +213 23 40 00 25
Fax: +213 23 40 00 24
Web: <http://www.tps-algerie.com/>
E-mail: tps-algeria@tps-algeria.com

ANGOLA

Anglobal

Smart Village Talatona - Zone
via AI 19 A
Talatona - Luanda
Tel: +244937222181/
+244917 534 925
Web: <http://www.anglobal.co.ao/>
E-mail: comercial@anglobal.co.ao

BAHRAIN

M. H. Al Mahroos BSC  

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+973 39462449
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Mohammed Jalal & Sons WLL

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Synergy International

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Manama
Tel: +973 17700165
Fax: +973 17700164
Web: <http://www.synergyim.com/>
E-mail: jrcastro@synergyim.com

EGYPT

ACE Arabian Co. for Engineering

4, Amr. Street, New Maadi
65 New Maadi
Cairo
Tel: +20 2 5188814
Fax: +20 2 7025703
Web: www.egypt-ace.com
E-mail: sales@egypt-ace.com

Ahmed Daoud

11 El Sherifein St.
Cairo
Tel: +20223921550/+20223921788
Web: <https://www.ahmeddaoud.com/>
E-mail: alifarghaly@ahmeddaoud.com

M.S.E. - Modern Structures & Equipment

PO Box 133
4, Ahmed Nessim St
El-Orman
Giza
Tel: +20 2 37495498
Fax: +20 2 37484329
E-mail: zeyadhabib@gmail.com

Orascom Trading SAE

120, 26th July Street
Agouza
Cairo
Tel: +20 2 334 52510
Fax: +20 2 334 73191
Web: <http://www.orascom.com>
E-mail: marianm@orascom.com

Otrac Heavy Equipment

Ardel-Kanoneyeen-Ring Road
Al-Salam City
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Tel: +202 26977799 / +202 21838999
E-mail: mai@otrac.com.eg

Otrac Heavy Equipment Co. (Doosan Portable)

Ardel - Kanoneyeen
Ringroad
El-Salam City
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Tel: +20 221838999
E-mail: ssawiris@otracheavy.com

Rich Uni (Triangle)

8 Kasr El Nile St.
Cairo
P.O Box 23
Agouza
Tel: + 201096889899/202 25799711
Web: www.richuni.com
E-mail: a.samir@richuni.com

Triangle Heavy Equipment

48 Elthawra Street
Dokki Giza
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E-mail: k.shawki@triangle.com.eg

ETHIOPIA

My Wish Enterprises PLC

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IRAQ

Al-Ghalib Co. Ltd. (Wirtgen)

Al-Mansour District
Al-Ameerat St. Sector 601
Alley 11, Bldg. 42
Baghdad
Tel: +962 79 6884222
Web: www.alghalib.com
E-mail: info@alghalib.org

KM Company

Kirkuk str
opposite of science college Er
Tel: +964 770 445 4027
E-mail: km.teksan@yahoo.com

Tristar Co. Iraq

100 Meters Road
(Newroz Junction)
Near Rojawa Emergency Hospital
Erbil
Tel: +964 750 4490287
E-mail:
mathew.M.Dunne@tristar-iraq.com

Vara Company for General Trading LTD

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Al Karrada
Baghdad
Tel: +964 (750) 470 8090 / 783 5011
Web: <http://www.varamachinery.com>
E-mail: haidar@varamachinery.com

JORDAN

Arab Equipment Trading Co. (Bobcat)

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Prince Hasan Street
Amman
11593
Tel: +962 6 4740840
E-mail: fuad.k@abujaber-group.com

The Near East Equipment Co. LLC

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Zahran Street
8th Circle
Amman
11814
Tel: +962 6 5812816
Fax: +962 6 5821653
Web: www.neec.com.jo
E-mail: sales@neec.com.jo

Toolbox

Sahrah Mosharfeh Street
Prince Hasan Street
Negem Complex
Tel: +962 6 4773001
E-mail: e.khateib@toolbox.com.jo

KUWAIT

AL SULTAN & KHALAF

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Al Mowasalat Street
Shuwaikh
70652
Tel: +965-24646666
Fax: +965-24838071
E-mail: fadi@sultan-khalaf.com

Al- Mahhar Al- Kuwaitiyya for Light and Heavy Equipment and Machines

Al-Qebila, Block 10
Abdullah Al-Mubarak street Ali tower
6th floor, office no.4
Plot no. 1/2/3
Kuwait
Tel: +965 22258145
Fax: +965 22258260
Web: www.qfab.com.qa
E-mail: qfab@qatar.net.qa

Bahrah Trading Co. WLL

PO Box 5869, Street 22
Al Rai Industrial Area
Safat
13059
Tel: +965 1803803
E-mail: mbiju@alsayergroup.com

Jubaili Bros (Kuwait)

Shuwaikh Industrial 2
Block 1, str 17
Asyawah bldg
Tel: +965 24610356
Web: www.jubailibros.com
E-mail: jbkwait@jubailibros.com

Teknoline Group

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Shuwaik Industrial Zone
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Tel: +965 24917101/102
Fax: +965 24917103
E-mail: teknoline31@hotmail.com

LEBANON

Allied Diesel S.A.R.L.

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Allied Building, Beirut
Tel: +961 1 877285
Fax: +961 1 887583
Web: <http://www.allieddiesel.com>
E-mail: alidsl@dm.net.lb

Cyber Roads

PO Box 116 – 5248
Badaro trade Center
7th Floor – Badaro
Beirut
Tel: +961 1 398000
Fax: +961 1 398000
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يعتقد 80 في المائة من الشركات أنه لا توجد موارد كافية للتدريب

من 60 في المائة من المشاركين أيضا بدعم ولا تزال دولة الإمارات العربية المتحدة تحتل الصدارة في سهولة ممارسة الأعمال التجارية. وعند سؤال المشاركين عن الدول الثلاث الأولى مجلس التعاون الخليجي التي تسهل ممارسة الأعمال التجارية فيها، اختارت الغالبية العظمى من المشاركين (96 في المائة) دولة الإمارات في المقام الأول، مقابل 89 في المائة في العام الماضي. في حين تأتي عُمان في المركز التالي بنسبة 47 في المائة، وبعثد 64 في المائة من المشاركين أيضا أن دبي هي المكان الأنسب لحل المنازعات الإقليمية، تليها المملكة العربية السعودية في المرتبة الثانية بنسبة 43 في المائة.



مارك ريمونت

الشركات الخاصة بهم تفضي استثمارات كبيرة في دول مجلس التعاون الخليجي من شأنها تعزيز التنوع بين الجنسين في المناصب الكبرى في صناعة البناء والتشييد، أجاب ما يقرب

أحد العوائق الكبرى على المدى القصير في القطاع. فيما يعتقد أكثر من 80 في المائة من الشركات أنه لا يتم تخصيص الاستثمارات الكافية للتدريب وتطوير مهارات المتخصصين في قطاع البناء والتشييد بدول مجلس التعاون الخليجي. من جانبه، قال مارك ريمونت رئيس قسم منازعات البناء والتشييد للشركة في الشرق الأوسط: «تظل هناك نظرة متفائلة مستمرة لقطاع البناء والتشييد في دول مجلس التعاون الخليجي، على الرغم من الصدمة التي أحدثتها انهيار أسعار النفط على مدى ثلاث سنوات». وأردف بقوله «بينما لا تزال المنطقة تواجه التحديات، نتوقع زيادة في مشاريع البنية التحتية، ولا سيما في المملكة العربية السعودية».

وبصرف النظر عن المخاوف المتعلقة بالتمويل والسيولة النقدية في السوق، كشفت النتائج عن أن ما يقرب من 80 في المائة ممن شملهم الاستطلاع في دول مجلس التعاون الخليجي لا يتوقعون عقد شراكات بين القطاعين العام والخاص هذا العام، وذلك على الرغم من أن هذه الشراكات تعد وسيلة لجذب المزيد من الاستثمارات الداخلية. ومن الجدير بالذكر أنه عندما سُئل المشاركون عما إذا كانوا يتوقعون توسيع نطاق حضورهم ومواصلة عملياتهم في مناطق إفريقيا جنوب الصحراء، أفاد 60 في المائة من المشاركين بعدم أخذ ذلك بعين الاعتبار.

كما كشفت الاستطلاع أيضا عن عدم لجوء 85 في المائة من المشاركين للمحكمة الجديدة المعنية بالنظر في دعاوى التكنولوجيا والبناء والتشييد في محاكم مركز دبي المالي العالمي. وعدم اعترافهم استخدامها، وذلك بالرغم من مشاركة نحو 60 في المائة من الشركات في عمليات وساطة أو أحد أشكال حل النزاعات البديلة خلال الاثني عشر شهرا الماضية. هذا، وتجدر الملاحظة أن ما يربو على 50 في المائة من المشاركين يعتقدون أن من قانون محدد لقطاع البناء والتشييد أمر مطلوب في دولة الإمارات العربية المتحدة يُعنى على وجه التحديد بشروط وأحكام السداد وحل المنازعات بكفاءة/سرعة أكبر، وما إلى ذلك.

جاءت نظرة المشاركين إيجابية فيما يتعلق بأهداف شركاتهم وصناعة البناء والتشييد الإقليمية بوجه عام، وعندما سُئلوا عما إذا كانوا يعتقدون أن القائمين على صناعة البناء والتشييد الإقليمية يبدلون جهدا كافيا لتحسين ممارسات الصحة والسلامة، أجاب أكثر من 60 في المائة منهم بنعم. وعلى الجانب الآخر، عندما سُئلوا عما إذا كانت

مفكرة إجال الأعمال 2019

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9 - 12 ... المؤتمر الرابع والعشرون للطاقة الدولية ... أبو ظبي

أكتوبر/تشرين الأول

21 - 23 ... معرض للمياه والطاقة والتكنولوجيا والبيئة ... وينكس ... دبي

نوفمبر/تشرين الثاني

5 - 8 ... الطاقة الموزعة - أوروبا ... ريميني/إيطاليا



التقرير يعرض آراء شريحة من العاملين في قطاع البناء والتشييد

بينسينت ماسونز: نظرة إيجابية لسوق الإنشاءات في الخليج

تتوقع الشركات العاملة في قطاع البناء والتشييد في دول مجلس التعاون الخليجي تلقي المزيد من الطلبات في 2019 ، مقارنةً بعام 2018، حسب استطلاع أجرته شركة «بينسينت ماسونز» لأوساط العاملين في قطاع البناء والتشييد في هذه المنطقة. فقد أظهر الاستطلاع أن 58 في المائة من المشاركين قد شهدوا زيادة في عدد الطلبات حتى وقتنا هذا في 2019.

27,22 مليون دولار أمريكي و 136,12 مليون دولار أمريكي، وفي حين ظل عدد المناقصات لدى المشاركين كما هو دون تغير عن العام السابق، فقد أظهر الاستطلاع أن القطاع لا يزال يجابه تحديات كبرى متعلقة بالسيولة المالية/الساد. وقد أكد معظم المشاركين (81 في المائة) على أن ذلك يعد

ويعرض هذا التقرير، الذي تم تقديمه لمختصين في هذا المجال خلال مؤتمر شركة «بينسينت ماسونز» السنوي القوالين الأعمال الهندسية والبناء، آراء شريحة من العاملين في قطاع البناء والتشييد في دول مجلس التعاون الخليجي، إذ تشارك غالبية الشركات في مشاريع تتراوح قيمتها بين

نظراً لهذا الاستطلاع السنوي، تحتل المملكة العربية السعودية المرتبة الأولى لتوقعات النمو في 2019. فقد أفاد 55 في المائة ممن شملهم الاستطلاع بأن المملكة تحظى بأفضل الفرص في السوق خلال الاثني عشر شهراً المقبلة، مقابل 29 في المائة في عام 2018.

المحتويات

القسم العربي

تحليلات

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ملخص محتويات القسم الإنجليزي

التطورات: تطورات السوق.

تحليلات: دور الذكاء الاصطناعي في قطاع البناء.

البناء: الصلب، الشاحنات، الرافعات، الأحجار.

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