

THE EAGLE HAS LANDED



DISTRIBUTORSHIP AGREEMENTS: The making of SA's equipment one-stop shop

MINING EQUIPMENT: Taking control of own mining destination

WET PROCESSING: Getting the better of water management challenges in wet processing

**ROAD
CONSTRUCTION**

Reconstructing
roadbuilding

PAGE 22

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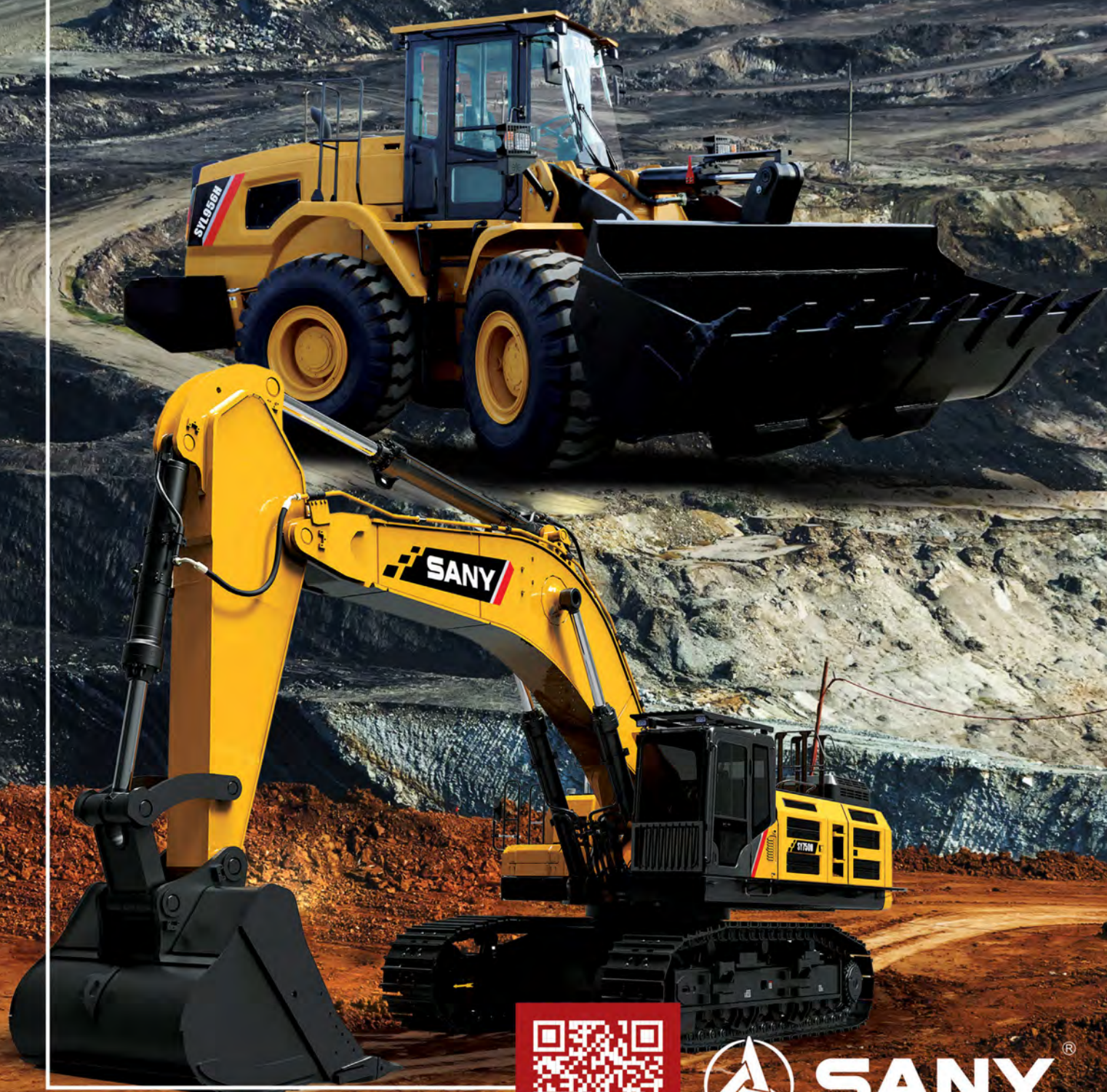
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THE CASE OF GROWTH OPTIMISM AGAINST SUPPLY CHAIN CHALLENGES

The global capital equipment market is confident that the industry will experience yet another buoyant year in 2022, following a resilient showing in 2021. At the same time, supply chain issues remain a great concern, while new COVID-19 variants and outbreaks could trigger new restrictions and slow the economy.

On a positive note, it's encouraging to see such widespread optimism about growth prospects for the industry following years of tough market conditions. In South Africa, the market is expected to continue with the moderate growth trend during the year. There are a few factors that are projected to drive the market, such as

increased production in mining and government's projected infrastructure rollout.

On the mining front, global efforts to combat the COVID-19 pandemic hampered most aspects of the metals and mining industry in the first half of 2020. The sector's rapid rebound in the second half, and rising demand for most mining commodities, has created robust conditions for producers and explorers alike.

The growth in South Africa's mining industry in 2021 confirmed the resilient nature of the sector and the opportunities that exist in the industry. With record rand prices for gold, the platinum group metals (PGMs) basket, iron ore and more recently, coal, it was no surprise that the industry's financial performance exceeded expectations on most fronts last year.

According to PwC, revenue from mining sales for the financial year (FY) 2021 for the PGM sector reached R300,7-billion – double the R150,9-billion posted in FY 2020. Mining sales for iron ore hit R116-billion compared with R72,7-billion in 2020. For gold, the figures rose to R102,6-billion from R80,7-billion.

S&P Global expects these conditions to persist into 2022, and in some cases beyond. While it is anticipated that metals prices will slip somewhat in 2022 from their current highs, medium-term supply constraints are setting the stage for historically above-average prices through to 2025 – driven mostly by increasing demand for materials used in the accelerating global energy transition.

There is also reason to be hopeful for a possible resilient growth cycle in the South African construction sector. Looking back on the economic recovery plans which were announced in 2020, we would recall that much of these plans centred on infrastructure development for job creation.

While 2021 didn't shoot the lights out in terms of construction project rollout, the government unveiled 62 projects at the Sustainable Infrastructure Development

Symposium South Africa last year. While the pace of progress has been slow, a notable number of projects have come to the market. According to the South African Institution of Civil Engineering (SAICE), approximately 33% of these projects are in construction and some have already been completed, with another 20% at various stages of preparation and feasibility.

The quarrying sector is also expecting a moderate rebound this year on the back of this projected infrastructure rollout. ASPASA figures show that total aggregates output plunged by approximately 10-million to 50-million in 2020, from 60-million t the previous year. While there was a slight recovery in 2021, ASPASA predicts output in 2022 to rise again to 55-million t.

While all these prospects paint a positive picture for the capital equipment market, challenges related to ongoing supply chain issues remain, including the price and availability of semiconductors, steel, rare earth elements and other scarce materials. Deloitte Global predicts that many types of chip will still be in short supply throughout 2022, and with some component lead times pushing into 2023, meaning that the shortage will have lasted 24 months before it recedes, similar to the duration of the 2008 – 2009 chip shortage.

On a completely separate note, this edition is my very last as the editor of **Capital Equipment News**. While I am excited about what lies ahead, there is also a big part of me that is sad to be saying goodbye to my amazing colleagues and the readership of this publication. I can't tell you how much I have enjoyed my five years in this role. Thanks to all of you who have made it possible by welcoming me to your sites, in your offices and in your factories to learn more about this industry. Heavy machinery is my greatest shot of adrenaline, and for the past 10 years, I have been an adrenaline junkie and a diesel head!



Munesu Shoko – Editor



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SCANIA

CASE Construction Equipment has launched the 22-tonne CX 220C LC Heavy Duty excavator in South Africa.



THE 'EAGLE' HAS LANDED

Under 'the Eagle has landed' theme, CASE Construction Equipment has launched the long-awaited CX 220C LC Heavy Duty excavator in South Africa. Key talking points on the new 22-tonne excavator are the viable price point and up to 10% fuel economy compared with the predecessor model, giving CASE the edge to compete for a larger share of the lucrative, yet competitive 20 – 25 t local excavator market, writes *Munesu Shoko*.

QUICK TAKE



CASE Construction Equipment has launched the long-awaited CX 220C LC Heavy Duty excavator in South Africa



With the arrival of the new 22 t excavator, CASE Construction SA is strongly confident of capturing a larger share of the market.



"Constituting about 20% of the annual excavator sales of about 3 850 units, the 20 t size class is an important segment of the market. Like any other manufacturer, it is critical for us, and a market of that size cannot be left untouched. The CX 220C LC Heavy Duty allows us to bite into that segment."

Graham Forte, Divisional MD of CASE Construction Equipment South Africa

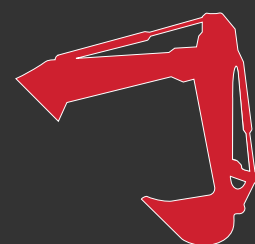
TALKING POINT



The CX 220C LC comes at a favourable price point compared with its predecessor, allowing CASE to be competitive in the 20 t market segment



Powered by the fuel efficient FPT engine, the machine offers up to 10% better fuel economy compared with its predecessor



1,9 M
DIPPER ARM

The excavator has a higher breakout force due to a 1,9 m dipper arm which enables continuous operations and an up to 10% higher digging capability

Latest on CASE Construction Equipment's arrival lounge is the 22-tonne (t) CX 220C LC Heavy Duty excavator which, according to Graham Forte, Divisional MD of CASE Construction Equipment South Africa, strengthens the

CNH Industrial brand's offering in this market segment.

The CX 220C LC, which replaces the company's previous offering, the CX 210, is suited for a range of applications, including quarrying, forestry, roadworks, earthworks and general construction.

"We are targeting the main sectors of the market, principally construction, plant hire and agriculture," says Forte, adding that the agricultural sector remains a lucrative market for CASE in South Africa, accounting for 56% of the company's sales.



An aerial view of the official launch of the new excavator in South Africa.

Key competitive edge

With the arrival of the new 22 t excavator, Forte is strongly confident of capturing a larger share of the market. Already commanding 28% and 19% market share in the local backhoe loader and skid steer markets respectively, CASE Construction SA believes it now has the right tool to boost its current 2% share of the 20 t excavator market.

“Constituting about 20% of the annual excavator sales of about 3 850 units, the 20 t size class is an important segment of the market. Like any other manufacturer, it is critical for us, and a market of that size cannot be left untouched. The CX 220C LC Heavy Duty allows us to bite into that segment. At the moment we are sitting at about 2% market share, which is not ideal for a market of that size and for a brand that already commands a market-leading position in the backhoe loader and skid steer markets.”

CASE Construction SA is initially aiming to grow its market share to 5% in the short term. Given that the 20 t excavator segment is an extremely competitive market with a lot of players, Forte says price plays a big role. For this reason, the CX 220C LC comes at a favourable price point compared with its predecessor,

allowing CASE to be competitive in this market segment.

A key factor in the excavator’s competitive price point is the fact that it is now manufactured in-house at CASE’s Madhya Pradesh plant in Pithampur, India. Previously, CASE Construction outsourced the production of its excavators to Sumitomo under licence. Leveraging an existing factory structure, in-house manufacturing has therefore ushered in significant cost savings, allowing CASE to be competitive in the market.

“The Pithampur plant is the same factory that already manufactures our backhoe loaders. Given that we already have an existing structure and, more importantly, access to a cost-effective labour market, we have leveraged these economies of scale to offer a competitively priced product that, however, matches the same quality of the European-made counterparts,” says Forte.

Efficiency and productivity

At a time when fleet owners are looking for every competitive edge they can get, the new CASE CX 220C LC has a special design focus on efficiency. Powered by the fuel efficient FPT engine, the machine offers up to 10% better fuel economy

compared with its predecessor.

Up to 4% of the fuel efficiency is attributable to the hydraulic system control and 6% to the FPT engine. The 6-cylinder FPT engine is said to deliver outstanding power and torque, which reduces the transient time, making the hydraulic system immediately reactive to any load. The operator can monitor the machine’s fuel consumption with the new ECO gauge function, which displays energy saving levels in real-time.

The CASE Intelligent Hydraulics System (CHIS), the result of continuous research and development, delivers greater machine control with sound energy and fuel savings in all cycle time phases. Two variable displacement axial piston pumps with a regulating system are combined with the CASE main valve, designed in Japan for fine, precise and efficient operations.

CHIS is governed by a machine control unit which collects input from pressure sensors located on pumps, main valve and pilot lines. The machine control unit maintains constant ‘dialogue’ with the engine control unit to optimise machine output at any moment, in any condition.

Central to the efficiency of the machine is also the CASE advanced



The CX 220C LC, which replaces the company's previous offering, the CX 210, is suited for a range of applications, including quarrying, forestry, roadworks, earthworks and general construction.

energy management system, which comprises five energy-saving controls. The Automatic Economy Control (AEC) improves fuel efficiency by dropping engine rpm when the joystick is in neutral position. The Boom Economy Control (BEC) increases fuel efficiency in boom lowering/swinging operations. The Swing Relief Control (SWC) optimises hydraulic power distribution in slewing operations to deliver the most efficient flow and pressure. The Spool Stroke Control (SSC) ensures pressure and flow control during digging and levelling operations. This is complemented by three idle functions: Auto Idle lowers engine rpm after five seconds of joystick inactivity; Idle Shutdown shuts the engine down after a pre-set time and Regenerative hydraulic circuit for boom, arm and bucket operations improves productivity.

With productivity in mind, the advanced hydraulic system offers higher breakout forces, improved swing speeds and greater swing torque, resulting in

faster cycle times and 5% increase in productivity.

The excavator has a higher breakout force due to a 1,9 m dipper arm which enables continuous operations and an up to 10% higher digging capability. Three work modes – Auto, Heavy and Super Power – ensure faster work cycles and increased efficiency on site.

Reliability matters

The CX 220C LC Heavy Duty excavator offers a robust design with increased plate thickness on HD structures, which improves overall durability. Boom and arm plate thickness have increased by 33%, while the upper-structure has been reinforced in all areas to increase durability. The boom has high strength casting parts joined with thicker hinge flanges to reduce stress on the structures. The arm design features a single side lateral thicker plate, with extra reinforcement plates and grid on bottom side.

Meanwhile, the bucket linkage has a

fortified structure and reduced tolerances for increased component life, thus minimising downtime. The anti-friction resin shims in the boom foot and head reduce noise and free play, increasing durability and reliability for the customer.

The long undercarriage offers increased stability on the toughest terrain. A sloped lower frame reduces the time needed to clean the undercarriage. A recoil spring increases stroke for better cushion performance. Track guards ensure that the chain is kept on the rollers in any condition.

Operator comfort

With CASE's understanding that a comfortable operator is a productive one, the CX 220C LC Heavy Duty excavator's HVAC-equipped, newly designed, spacious cabin with no noise and vibration comes with a new vibration dampening system to help prevent body fatigue.

The wide and spacious cab offers ample legroom and a more secure and safe working environment. An ergonomically designed seat with eight different adjustments enhances operator comfort and productivity. An openable roof window provides better visibility.

The fully adjustable right-hand console includes advanced engine throttle control which determines working mode selection. The console is equipped with high luminosity switches to ensure that the graphics are clear and easily legible in bright sunlight.

Aftermarket support

Apart from the product, Forte says CASE Construction SA will leverage its strong network of branches and dealers to offer unparalleled support to its customers.

"Our plan of attack is to offer value to the customer, because a machine is only as good as the service that you provide," he says.

"CASE serves its customers across South Africa with a well-positioned network of branches, dealers and sub dealers. Our dealers are able to advise the customer on the best solution for their operation and their business. Their aftermarket services provide the backup needed to keep these valuable assets fully utilised. At CASE we understand that the purchase process is only the start of the relationship. The real growth and strengthening of that relationship comes from being able to service our customer's machine in time and have excellent parts availability when needed. For the CASE aftermarket services team, when a customer's machine goes down, the stopwatch starts," concludes Forte. 🌟



In August last year, Kemach Equipment signed a distributorship agreement to sell and support the full range of Liebherr earthmoving equipment in South Africa.

THE MAKING OF SA'S EQUIPMENT ONE-STOP SHOP

Having successfully backed the JCB brand in South Africa and neighbouring countries for the past 18 years, Kemach Equipment has over the past year adopted a multi-brand approach, following the signing of new strategic distributorship agreements with several leading global OEMs. The strategy behind the 'one-stop shop' approach, explains CEO Les Lothian, is to provide customers with the convenience and efficiency they need by offering a multitude of products and services under one roof, writes Munesu Shoko.

Established in 2003, Kemach has over the years been the force behind the JCB name in South Africa and neighbouring countries such as Lesotho and Eswatini (previously Swaziland). However, following the end of the JCB dealership agreement in 2021, Kemach has adopted a multi-brand strategy that has seen the company entering into distributorship agreements with several premium equipment brands.

The business realignment strategy was put in motion in March 2020 when, in partnership with Anhui HELI, Kemach introduced its Kemach Forklift range, giving the company a footprint into the booming materials handling market.

The distributorship agreement with McCloskey International in October 2020 was a further coup for Kemach in its quest to expand its products and services in the mining, aggregates, construction and demolition, recycling and infrastructure markets.

In July 2021, Kemach was appointed as the new supplier of the full range of BULL backhoe loaders in South Africa, Lesotho and Eswatini. This was followed by yet another strategic distributorship agreement with BOMAG GmbH in August 2021, allowing Kemach to market and support the full range of BOMAG's heavy and light machines in South Africa, Lesotho and Eswatini.

During the same month, Kemach Equipment signed a distributorship agreement to sell and support the full range of Liebherr earthmoving equipment in South Africa. The range includes excavators (20 – 100 t), wheel loaders (10,4 – 25 t), bulldozers (20 – 73 t) and a line of telehandlers.

With effect from September 1, 2021, Kemach also took over the distributorship of the Torpedo range of breakers from Maximum Equipment.

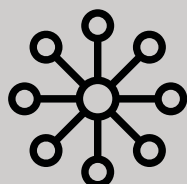
Meeting customer needs

The multi-brand strategy, explains Kemach Equipment CEO Les Lothian, is in line with the ever-changing needs of customers. With the evolution and transformation of project scopes, he says, the introduction of strong, high-performance products and cost-centric services is needed now more than ever.

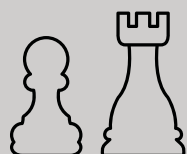
"We felt that by being linked to a



The distributorship agreement with McCloskey International in October 2020 allows McCloskey to expand its products and services in the mining, aggregates, construction and demolition, recycling and infrastructure markets.



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In August 2021, Kemach Equipment signed a distributorship agreement to sell and support the full range of Liebherr earthmoving equipment in South Africa

TAKE

QUICK

single brand we were limited to a certain extent. There are several sectors of the South African economy which we couldn't participate in. With a single brand, we were

pretty much limited to the construction sector, and missed out on opportunities in the materials handling, mining and quarrying sectors, among others," explains Lothian.

It is a common norm that businesses should never put all their eggs in one basket; this is the central thesis on which the concept of diversification lies. Given the importance of a well-diversified portfolio in any market condition, Lothian maintains that the multi-brand approach places the business in a far more balanced position. In the event that one of the markets struggles, for example when construction is down, the business can tap into other markets such as mining and materials handling to remain on a level footing.

"We are building our business around five different pillars – Kemach Forklifts (materials handling), McCloskey (crushing & screening), BULL backhoe loaders (construction), BOMAG (infrastructure development) and Liebherr, which gives us a footprint in not only construction, but also the logistical handling of mining materials. All of these segments leverage each other, giving our business the much-needed balance," says Lothian.

Apart from diversification into different sectors of the economy, the multi-brand strategy also allows Kemach Equipment to offer a total solution to its customers. As customers chase the convenience that comes with dealing with a single provider for their different needs, the equipment industry has not only seen an accelerating trend towards consolidation within the supplier community, but also an expansion of the range of products and services offered under one roof. This has created true one-stop shops that are able to service a wide range of customers' needs from one stable.

"In a crushing and screening application, for example, we are now able to offer a crusher and a matching excavator to load it.



As the authorised BOMAG distributor in South Africa, Lesotho and Swaziland, Kemach markets the entire BOMAG product line.



In a fiercely contested South African backhoe loader market with over 24 players vying for market share, Kemach believes that the BULL backhoe loaders are the 'ultimate wheelbarrows' of the market.



"As a total solutions provider, we are in a better position to add value to our customers' businesses. We are offering a product range that gives our customers value – lower cost per tonne, long life and high resale value."

Les Lothian, CEO of Kemach Equipment

TALKING POINT

At the backend, the customer may need a wheel loader to clean up whatever they are handling and to load material onto trucks. Previously, we were not able to offer that full value chain, but now we can," he says. "We have also been very careful in selecting our OEM partners. All the products in our stable complement each other, are of the highest quality and offer true value for money."

Kemach forklifts

Under its Kemach Forklifts division, Kemach, in partnership with Anhui Heli, launched its new range of Kemach forklifts for the South African and sub-

Saharan African markets in March 2020. The move set in motion the company's multi-brand strategy at the time. The supplier agreement between Kemach Forklift and Anhui HELI was signed in January 2020. Anhui HELI is the biggest forklift manufacturer in China and complies with all European standards and is ISO approved.

The Kemach range of forklifts has specified Japanese engines, Heli-built ZF transmissions and robotically manufactured chassis, ensuring premium brand quality at competitive pricing. The extensive range starts from a walk-behind powered pallet

jack, up to a 45-tonne container handling unit, allowing the company to compete in all sectors of the materials handling market.

"The forklift business has performed beyond our expectations, especially considering that we launched right before the COVID-19 outbreak in South Africa. We have already sold over 300 units, with some leading blue-chip companies taking delivery of these units. The penetration of our rough terrain range has been superb," says Lothian.

Crushing & screening

Commenting on the McCloskey offering, Lothian says Kemach chose McCloskey because of the brand's stature in the South African and the global market at large. "Being part of Metso Outotec, we felt that the brand was the right fit for our needs," he says.

Since October 2020, Kemach has recorded remarkable success with the McCloskey offering, averaging a machine a month. The machine population is spread across quarrying, mining and recycling applications.

"Adding McCloskey to our range of leading brands enhances our ability to satisfy the growing needs of our customers, while also creating the opportunity to strengthen our position of being a total solutions provider to the markets we participate in," he says. "With sustained and strong growth in the population and the required infrastructure, we anticipate equally strong growth in the aggregates sector. Bringing McCloskey products to the market at this key time benefits our company and our customers."

BULL backhoe loaders

In a fiercely contested South African backhoe loader market with over 24 players vying for market share, Lothian believes that the BULL backhoe loaders are the "ultimate wheelbarrows" of the market. To drive his point home, Lothian says BULL is already a substantial player in the Indian market, which sells between 40 000 and 50 000 units a year.

Leveraging an existing wide backhoe loader customer base, Lothian is adamant that Kemach will be a player of substance in the backhoe loader market in South Africa, which sells about 1 200 to 1 300 units a year.

"The world has changed, and customer needs have evolved. We believe that with the addition of the BULL product to Kemach Equipment's expanding world-class offerings, we have the ultimate earthmoving solution across all industries," he says. "This is a robust product built on the right fundamentals. We will complement it with good support and an industry-first 3 year/4 000-hour wet drivetrain warranty as standard."



The Kemach forklift business has performed beyond the company's expectations since its launch in March 2020.



The larger Liebherr excavator range allows the company to compete at the larger end of the scale.

BOMAG

In August 2021, Kemach signed a distributorship agreement with BOMAG. As the authorised BOMAG distributor in South Africa, Lesotho and Swaziland, Kemach markets the entire BOMAG product line, including compaction machinery for asphalt, soil and landfill construction, as well as milling machines, finishers and recycles. The range also includes soil stabilisation equipment and

binder spreaders.

"It's a massive product line, which goes all the way from a tamper to a massive paver. The innovative nature of the product is incredible," says Lothian.

Lothian is excited about having the BOMAG range in the Kemach stable, saying that becoming the local BOMAG distributor is an exciting opportunity for the company to engage with a new product line and expand its offering to the customer.

"It's a huge win for us. It fits perfectly well with where the economy is going. Government has announced a massive infrastructure development programme and we are positioned to play a critical role in that," he says. "BOMAG is also a big name in landfill construction, and has had huge success in that market in the last couple of years with the previous dealer. Given South Africa's waste problem, we believe we will play a significant role in that segment."

Liebherr earthmoving range

Having previously been a construction-focused equipment supplier, the Liebherr earthmoving range gives Kemach Equipment a foothold into new sectors such as mining and quarrying.

Liebherr and Kemach are two household names in the South African earthmoving equipment industry. The two companies, says Lothian, will leverage each other's strengths to provide customers in South Africa with a high-end product that is backed by unparalleled after-sales support.

"With over 70 years of trusted machinery development and building across more than 10 industries, Liebherr products are a vital addition to the Kemach Equipment family and with this partnership, we can continue with our promise to be the best business decision for our customers," says Lothian.

On the construction side of things, Lothian says Liebherr offers a strong offering in the 20 – 30 t excavator segment, which constitutes about 60% of the excavator market in South Africa.

The larger excavator range, together with the extensive wheel loader offering, also allows the company to compete at the larger end of the scale, complementing the McCloskey offering in the crushing and screening space. Lothian is also excited about the prospect of having a dozer range in the Kemach stable for the first time.

"We have never had an experience with dozers. It's a small segment of the market, but the value is substantial. The local market has a lot of confidence in the Liebherr product line and we are excited about the prospects of growth in that market segment," he says.

"This is going to open new doors for us," he adds. "Our experienced sales team is now equipped to provide current and future customers with a 360-degree solution across applications. If we can package this with extended warranties and service plans, we will be able to create absolute peace of mind for our customers."

Commenting on the strategy, Lothian says one of the concerns around the Liebherr product in the local market has always been the price. However, the two companies are



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working together to offer a price-competitive product to the market. Leveraging a strong support footprint at the back-end of the market, Lothian believes that the Liebherr venture will be a major success for the company.

"We have taken delivery of a few machines from Liebherr-Africa. We also have a large fleet on order, and when the product hits the ground, there will be substantial changes in the way we are going to market it.

Accessories

To complement its range of BULL and Liebherr tool carriers, Kemach has added the Torpedo range of hammers to its stable. The range was previously distributed locally by Maximum Equipment, which remains a sub-dealer for Kemach in South Africa.

"We previously had the JCB range of hammers in our stable. Given that most of our existing customers are already running hammers with their TLBs and 20 – 30 t excavators, we felt that we really needed to look for a reputable offering, and we are glad to have secured the distribution right for Torpedo, which is such a respected name in the local market," says Lothian.

Additionally, Kemach offers tyres and its own range of Kemach lubricants, thus reinforcing the company's one-stop shop approach.

Support matters

Key to success, adds Lothian, will be the company's strong branch footprint across all key regions of South Africa and neighbouring countries. Sales, support and service are delivered through Kemach's extensive southern African footprint, including its national office based in Gauteng, and branches situated in 11 locations throughout South Africa.

To ensure seamless operations throughout its territory, the company has a network of fully-fledged branches in Jet Park, Ethekwini (Durban), East London, Gqeberha (Port Elizabeth), George, Cape Town, Bloemfontein and Nelspruit. This is complemented by a network of sub-dealers strategically positioned in Schweizer Reneke and Polokwane in South Africa, as well as Windhoek (Namibia) and Swaziland. Kemach also owns and operates its own branch in Lesotho.

The company is also currently re-establishing branches in the mining towns of Rustenburg (North West Province), Middelburg (Mpumalanga Province) and Kathu (Northern Cape Province) in South Africa.

Looking ahead, Lothian is excited about the prospects of growth for the company across the infrastructure value chain. Given that South Africa's economic recovery plans centre on infrastructure development, there is sentiment that many infrastructure projects will come to market in the next few years.

The South African government unveiled 62 projects at the Sustainable Infrastructure Development Symposium South Africa in 2020. While the pace of progress has been slow, approximately 33% of these projects are in construction and some have already been completed, with another 20% at various stages of preparation and feasibility.

"As a total solutions provider, we are in a better position to add value to our customers' businesses. We are offering a product range that gives our customers value – lower cost per tonne, long life and high resale value. All of these parameters build value for the customer. Given the tough nature of doing business in the current environment, we believe we are geared to help customers make the best business decision," concludes Lothian. 🌱



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Liebherr's R 9400 E and T 264 operating in Russia.

LIEBHERR MINING ADVANCES ZERO EMISSION PROGRAMME

Liebherr Mining, which already offers a range of solutions to help customers reduce emissions, has clear targets and a roadmap to expand its current offering to achieve low carbon solutions in 2022, along with fossil fuel-free solutions for the majority of applications by 2030. By Munesu Shoko.

The global mining industry has demonstrated its commitment to cut greenhouse gas (GHG) emissions in support of the Paris Agreement, with many major mining houses announcing decarbonisation targets over the past 18 months.

The increased focus on GHG emission reduction has accelerated the implementation of Liebherr's existing low carbon solutions and triggered future projects to offer completely fossil fuel-free mining equipment options. Liebherr Mining's strategy to reduce GHG emissions will mainly focus on the operational phase of its machinery, as studies show that more than 90% of GHG emissions over the complete lifecycle of the equipment occur during this phase.

Liebherr Mining's Zero Emission Programme, which was established to develop these future solutions, is well aligned with the values of the Liebherr Group as an independent and responsible, family-owned company.

The Liebherr Group has existing in-house core competencies, across all 13 product segments, in electrification, batteries, internal combustion engines, injection systems and alternative renewable fuels. Building from this experience, the Zero Emission Programme has clear targets and a roadmap to achieve low carbon solutions for the full range of off-highway trucks and excavators in 2022, and fossil fuel-free solutions for the majority of applications by 2030.

The Zero Emission Programme strives to deliver long-term sustainable products

and services, providing different options centred on environmental sustainability, safety, cost, flexibility and maintainability. Modularisation, along with an energy type agnostic approach to drivetrains, are key elements in Liebherr Mining's strategy, easing the transition for customers with the possibility to retrofit modules.

2022 target

Liebherr Mining has developed and offered electrification solutions for many years and is now about to finalise all initiatives to achieve its first 2022 target to offer low carbon emission solutions for its complete digging and hauling range. The technologies, including the haul truck Trolley Assist System and electric excavator range, are consistently achieving proven results in the field



The Liebherr Trolley Assist System offers a low emission solution for customers.

QUICK	TAKE
Liebherr Mining has officially launched its Zero Emission Programme to offer low carbon emission solutions for the full range of its trucks and excavators by 2022 and fossil fuel-free solutions by 2030	
Liebherr's approach will provide modular solutions that can be upgraded or retrofitted, to support customers on their path towards decarbonisation	
Research and development into battery power modules, fuel cell-battery hybrid modules and internal combustion engines powered by renewable-based alternative fuels is in progress	
Liebherr has announced strong partnerships with industry experts ABB and ENGIE	

to lower carbon emissions. The newly introduced in-built Liebherr Power Efficiency control system has also shown excellent results since field operation began in 2019.

Trolley Assist System

With the T 264 trolley components production ready in 2022, all Liebherr trucks will be available with Trolley Assist

System, providing a low emission solution for customers.

The Liebherr Trolley Assist System is an effective first step on the road to zero emission mine sites of the future. Utilising an overhead pantograph or trolley bars to connect the electric-drive system to the electrical network, the Trolley Assist System offers increased truck fleet productivity, or reduction in fleet

size, while maintaining yearly production when compared with standard trucks. A significant reduction of diesel fuel consumption is also made possible with the Trolley Assist System along with a reduction of the truck fleet CO₂ emissions. However, this of course depends on the percentage of renewable energy content in the grid supplied power.

Liebherr delivers proven field experience with 39 T 284 units fitted with the Trolley Assist System currently in operation on two different sites, with more to be commissioned in 2022. Liebherr is also the first company to run a 100 t truck under trolley, with a fleet of T 236 trucks running on a 5 km trolley line in Austria – the longest trolley line in the world.

The largest range of electric excavators

The Liebherr Group has over 30 years of experience in electric driven machines for earthmoving, material handling and mining applications. Today, Liebherr Mining is said to offer the largest range of electric driven excavators on the market. Ranging from 130 t to 800 t, the R 9150, R 9200, R 9250, R 9350, R 9400 and R 9800 are all available as electric drive versions. The electric drive R 9600 will soon be available.

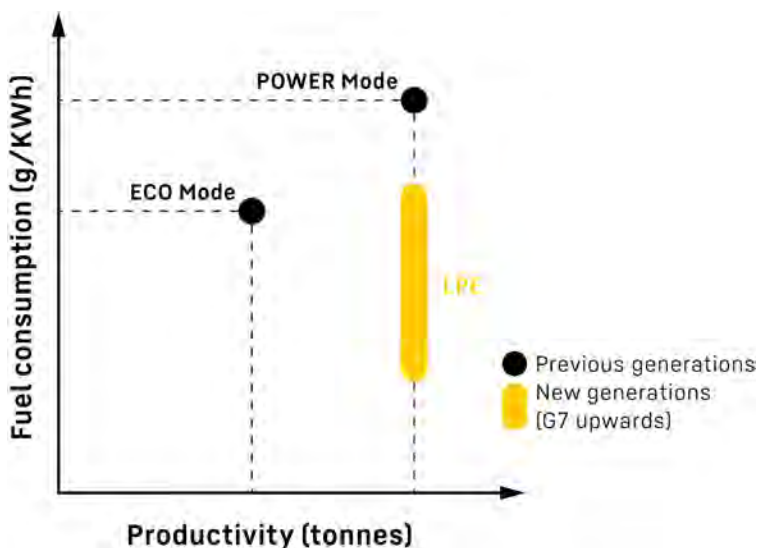
Liebherr electric excavators are existing and already proven solutions helping customers to build future sustainable mine sites. Focusing on reliability, maintainability and maximum safety, Liebherr's engineering teams strive for solutions requiring minimum change to existing energy infrastructure and operational behaviour on customer sites. Thanks to 70% of parts commonality with diesel versions, Liebherr also offers complete retrofit options for existing machines.

To offer better machine mobility and safety for the workforce on site, Liebherr has developed a cable reel option for all electric drive excavators either in backhoe or face shovel. The cable reel is completely autonomous and has a capacity up to 300 m depending on the excavator type. Furthermore, Liebherr proposes an operational concept for excavators with cable reel in backhoe application, particularly in double benching operations.

Move more for less

Liebherr is continuously improving and upgrading its standard machines to enable the transition to emission reductions. Liebherr Power Efficiency (LPE) is the most recent built-in technology upgrade making this productivity and sustainability contribution.

Starting with Generation 7, all Liebherr



Liebherr Power Efficiency is the most recent built-in technology upgrade in Liebherr machines.

mining excavators will be equipped with Liebherr Power Efficiency (LPE) as standard. This specific engine and hydraulic management system drastically reduces fuel consumption by up to 20%.

The system adapts piloting processes according to operator requirements; electronically controls pressure and oil flow; has increased efficiency of the control valves and the new Liebherr pumps; has a fully integrated engine control system; reduces hydraulic losses and load profile of the engine for increased component lifetime; and reduces energy consumption without impact on the machine performance.

Based on constant research and development, Liebherr is able to provide size-equivalent machinery with higher production rates and less fuel consumption.

In fact, the combination of LPE together with the improved productivity of the R 9600 has shown 29% less fuel consumption per tonne of produced material over a one-year production study, compared to its predecessor, the R 996B. Expressed in fuel efficiency, tons per litre, this corresponds to a 40% better utilisation of the fuel.

These outstanding efficiencies allow Liebherr excavators to set new benchmarks in their respective classes and are a very important enablers for any kind of future drive train, as they significantly reduce the effort for cable handling or refuelling and storage of alternative fuels.

Pathway to zero emission solutions

As a second step, Liebherr is now targeting to offer completely fossil fuel-free mining equipment for hauling, digging and dozing by 2030. The development will take into consideration the GHG

emissions over equipment's full lifecycle, as well as the overall well-to-wheel energy ecosystem. The company is also taking into account the operational mining process conditions that influence the right energy type choice.

Liebherr will develop three drivetrain options to achieve near zero emissions for its off-highway trucks: battery power module, internal combustion engines powered by renewable fuels, and H2 fuel cell-battery power module.

Drivetrain electrification through battery combined with trolley assist is already underway. Despite some challenges, Liebherr sees also an opportunity that the propulsion energy can be provided by using hydrogen fuel cell-battery hybrids.

Research and development for internal combustion engines operating with renewable-based alternative fuels is progressing very well within the Liebherr Group, with Hydrogenated Vegetable Oil (HVO) as an approved fuel for machines powered by Liebherr engines as a first step.

Hydrogen combustion engines are also currently being tested in Liebherr's factory in Switzerland. The methanol combustion process has been developed for large displacement engines and is ready to move towards serial engine industrialisation based on market demand. Additionally, the ammonia combustion process is under investigation, with Liebherr seeing high potential in the usage of ammonia for heavy mobile, high energy demanding machines and gensets.

Liebherr mining excavators and dozers will also both have the option to be powered by internal combustion engines running on alternative fuels, along with the already existing electric drive version for excavators.

The combination of Liebherr Power Efficiency together with the improved productivity of the R 9600 has shown 29% less fuel consumption per tonne of produced material over a year production study, compared to its predecessor, the R 996B.



To achieve near zero emissions for the mining dozer and excavator, it is also crucial to utilise the most efficient drive system to reduce fuel consumption. The Liebherr hydrostatic drive system already achieves up to 20% improved fuel efficiency compared to mechanical competitor products. Despite this, Liebherr is currently in the process of comparing efficiency of an electric drive on a dozer prototype with hydrostatic drive efficiency. Given Liebherr's expertise in both hydrostatic and electric AC drive systems, the company is in best position to choose the most appropriate option for the best drive system for the near zero emission solution.

To accelerate the process and ensure the best solutions will be offered, Liebherr is partnering with industry experts for its Zero Emission Programme. ABB, a leader in power and automation technologies, develops state-of-the-art technology and equipment for overall electrification of mine sites and supports our customers and Liebherr with a particular focus on trolley assist infrastructure deployment.

ENGIE, the global reference in renewable hydrogen, low-carbon energy and services, will jointly with Liebherr evaluate the different renewable energy solutions, in particular renewable hydrogen and hydrogen-derived fuels, for loading, hauling and dozing processes. The cooperation ensures that an integrated well-to-wheel approach is basis to define the best solutions for the mining industry.

With concept studies nearly finalised for trolley-battery hybrid, and ammonia and methanol for internal combustion engines, Liebherr expects to undertake field validation from 2024 – 2026, followed by the integration of proven fossil fuel free solutions from 2026-2030 into the entire range of mining machines. 🌱



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GETTING THE BETTER OF WATER MANAGEMENT CHALLENGES IN WET PROCESSING

While wet processing is a crucial part of mineral processing, water scarcity remains one of the burning environmental issues that operations have to contend with. However, wet processing solutions from various OEMs are helping mining and quarrying companies overcome water management challenges. By Munesu Shoko.

Within the extractive industries, the value of materials is significantly increased when washed, but water is a sensitive subject.

According to Gerrit du Plessis, product specialist at Multotec, a major problem for mines and quarries currently is that it is becoming increasingly difficult to obtain the requisite water use licences for expansions.

"Another challenge is that deteriorating water quality due to reuse without treatment can have knock-on effects such as lower recovery rates where chemicals are involved and scaling due to an increase in the hardness of the water. There is

also, of course, an increase in costs when contaminated water has to be stored," explains Du Plessis.

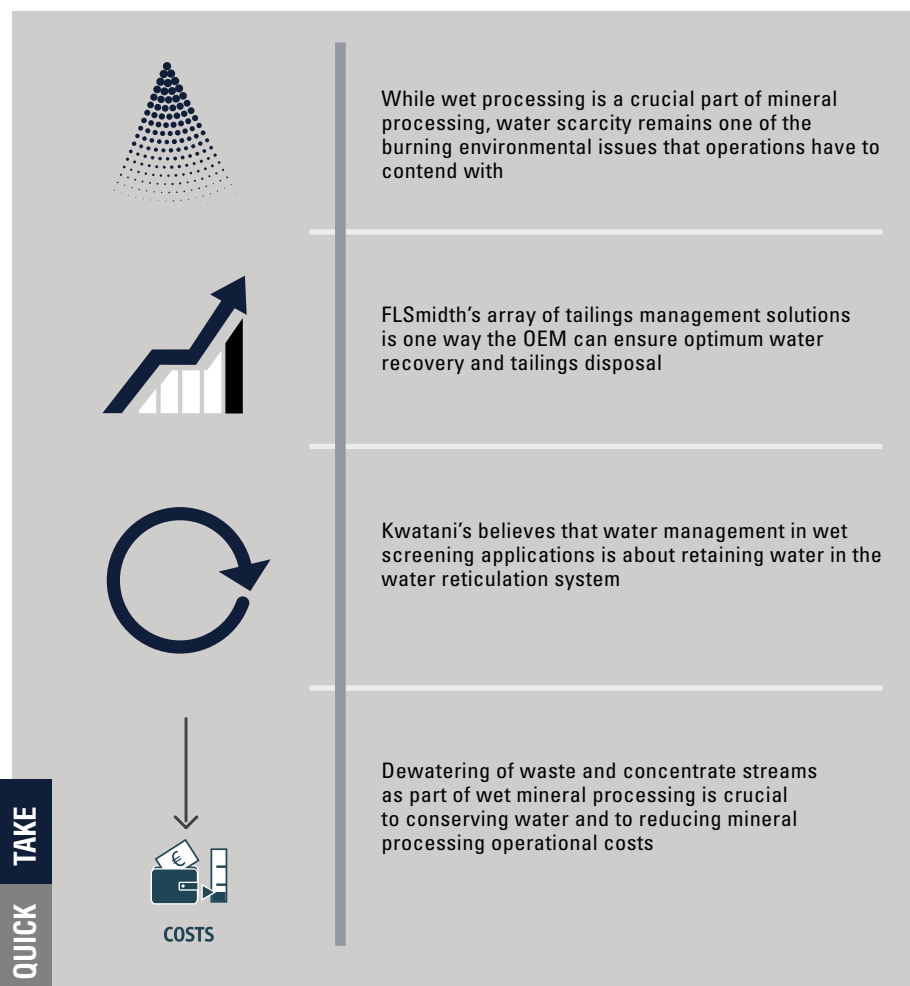
Wayne Douglas, head of R&D, Innovation and Minerals Testing & Research Centre (MTRC), Mining Industry, FLSmidth, reasons that with growing populations, a larger middle class and the transition to a low-carbon, green energy future, the demand for minerals will only increase in the next decade. This means a greater environmental impact from mining. A more sustainable future, he says, requires action and FLSmidth is leading the move towards zero emissions in mining, without compromising quality or its customers' commercial competitiveness.

"An average size concentrator with a capacity of 100 000 tonnes/day can require 50 000 to 70 000 m³ of makeup water per day. Often our largest mineral resources are found and mined in highly water-stressed regions. To address this challenge, FLSmidth provides a full suite of technologies for water recovery, including thickened tailings, paste tailings as well as filtered tailings solutions that can recover up to 95% of the water used in the process. With our full tailings solutions, EcoTails, we can provide fast filtered tailings that can be blended with waste rock to form a geotechnically stable GeoWaste that can then be conveyed and stacked," explains Douglas.

Every mine is different and has its own



A large Kwatani double deck banana screen used in the diamond mining industry.



requirements and challenges, adds Douglas. Therefore, FLSmidth houses a full suite of testing, engineering services and technology dedicated to finding the right solution for its clients.

Kwatani is one of the leading custom-designed vibrating screen original equipment manufacturers (OEM) in South Africa. Its view with regards to water management related to wet screening applications

is about retaining water in the water reticulation system.

"This is achieved by reducing water overflow over the screen's discharge end. Other factors are the quality of water, scaling of pipes that restrict waterflow and suspended solids in the water that leads to increased wear and leaking of water pipes, among others," says Kenny Mayhew-Ridgers, COO of Kwatani.

Leveraging research

Innovations in the washing sector are helping mines and quarries overcome challenges around water management. For example, Kwatani's research and development team made use of the latest research publications available on dewatering.

"Interpretation of the publications showed clearly that the way the dewatering banana screen has been designed since its existence is not ideal. This led the Kwatani development team to engineer a new innovative banana screen design that still looks like a banana screen but outperforms traditional designs," says Mayhew-Ridgers.

Kwatani's approach takes into consideration the type of screening panels used together with the process parameters and the screens' mechanical parameters, of which there are at least seven; this ensures optimal performance.

"This approach is different from others; the screen design remains the same while screening panels are replaced with other types of panels until a solution, and in many instances, a compromised solution, is found. Kwatani relies on its four decades of experience, in-house research and development team and test laboratory to come up with the best design for the application at hand," adds Mayhew-Ridgers.

A key case study is where Kwatani was approached by a South African diamond mine to improve the performance of its degrit process as the amount of water carryover that the operation was experiencing limited its existing screens' throughput. Kwatani applied its new innovative approach to banana screen designs that required the adjustment of several of the mechanical parameters.

"This was accomplished while being able to fit the newly-designed screen on the existing footprint without any changes required to the plant. Significantly, the Kwatani banana screen managed to double the mine's throughput without increasing the size of the screen. This success speaks for itself," says Mayhew-Ridgers.

Optimum water recovery

FLSmidth's array of tailings management solutions is one way the OEM can ensure optimum water recovery and tailings disposal. Coupling that with its full flowsheet strength, FLSmidth is able to look upstream for opportunities on processing conditions that affect tailings requirements such as milling and flotation. The ability to optimise particle size distribution and metallurgical recovery with tailings in mind can further improve downstream impact to tailings.

"Optimised grinding with pump and cyclone performance is one example of ensuring we efficiently optimise both the energy efficiency and particle size cut to ameliorate metallurgical recovery while minimising fines generation," says Douglas.

"Flotation technologies such as MixedRow combine the unique performance of our nextSTEP forced-air with naturally aspirated WEMCO to ensure valuable minerals are not lost as tailings. Our array of advanced sensors such as LoadIQ, FrothVision and BulkExpert for Tailings provide the advanced sensing and process control needed to both minimise plant upsets and maximise performance," adds Douglas.

FLSmidth was recently chosen as the preferred provider for four large, bolted thickeners for a coal plant in Mozambique. Two of the thickeners are designed to reduce water load on the filters, allowing for a drier filter product, while the other two thickeners recover water from the plant tailings. The installation, which includes E-Volute feedwell technology, will contribute to achieving optimal water balance in the plant.

Elsewhere in the African region, FLSmidth vacuum disc filters are playing a vital role at a new copper mine in the DRC in preparing tailings slurry for a backfill application. Four 3,8 m disc filters provide a cost-effective dewatering strategy, resulting in a cake dry enough to be mixed with cement and other additives before being transported underground to be placed in mined-out workings as backfill.

Further afield, FLSmidth has completed an innovative project for Hindustan Zinc Ltd (HZL) at its Zawar location in India. The tailings dam at Zawar was reaching capacity for conventional wet deposition with no space nearby to expand. The company was looking for a tailings management system that offered significant benefits in terms of environmental sustainability, process water recovery and a reduced footprint for the tailings storage facility.

"After evaluating several alternatives, HZL chose our dewatering concept, comprising a high-density thickener and E-disc filter technology. A key benefit of the system is the recirculation of more than 86% of the process water present in the tailings," explains Douglas.

Conserving water

Dewatering of waste and concentrate streams as part of wet mineral processing is crucial to conserving water and to reducing mineral processing operational costs, says Multotec's De Villiers.

"Our filter press technology plays an important role here to recover maximum water and produce a dewatered product



"Our filter press technology plays an important role in recovering maximum water and producing a dewatered product suitable for economical conveying to the next process step or to discard the waste economically."

Gerrit du Plessis, product specialist at Multotec



"An average size concentrator with a capacity of 100 000 tonnes/day can require 50 000 to 70 000 m³ of makeup water per day. Often our largest mineral resources are found and mined in highly water-stressed regions. To address this challenge, FLSmidth provides a full suite of technologies for water recovery, including thickened tailings, paste tailings as well as filtered tailings solutions that can recover up to 95% of the water used in the process."

Wayne Douglas, head of R&D, Innovation and Minerals Testing & Research Center, Mining Industry, FLSmidth



"Although screening plays a minor role in the management of water in a plant, our view is that the ideal solution lies in reducing the amount of reject material processed by water. This can be achieved by eliminating the reject material in the upstream processes. For this reason, Kwatani is closely associated with world leaders in ore sorting technology."

Kenny Mayhew-Ridgers, COO of Kwatani

suitable for economical conveying to the next process step or to discard the waste economically," he says. "Our filter presses can improve cake dryness, produce clean filtrate and reduce processing times by up to 10 minutes per cycle. Automated feed introduction, material discharge, pressing and filter cloth self-cleaning are features across this range."

Commenting on the benefits, De Villiers says waste streams generated in wet mineral and chemical processing streams result in increasing levels of contaminants and it becomes more difficult to separate the impurities from the water. Multotec supplies robust centrifuge technology to recover waste or product crystals after evaporation/crystallisation steps to provide a concentrated product or waste stream that is economically manageable by the end user.

The water is recovered from the evaporation/crystallisation steps within specification and water can be re-used in the process again. Saleable products can also be produced by crystallisation, followed by dewatering, and product washing in the company's pusher-type and Conturbex-type centrifuges. For high-purity product requirements the pusher-type centrifuge provides high washing efficiencies.

Multotec centrifuges are used in many dewatering and classifying applications in the global minerals processing industry and are able to achieve accurate solid/liquid separation. Sourced from Siebtechnik Tema, they are of compact design, making them ideal for small operating areas.

Commenting on some key case studies where this technology has been deployed, De



The FLSmidth REFLUX flotation cell.



Multotec filter press recovers maximum water and produce dewatered product suitable for economical conveying to the next step or discard the waste economically.



Kwatani applied its new innovative approach to the banana screen designs for a diamond mine in South Africa.

Villiers says one example is a chrome mine in Limpopo which was faced with various risks in disposing its tailings, and called Multotec for a solution. The mine management was keen to conserve scarce water resources by avoiding evaporation and was also concerned about potential groundwater contamination.

"After intensive investigation, which included testing at our Spartan facility in Johannesburg, we recommended our filter press technology. This proved to be highly-successful and the filter press was able to immediately recover about 80% of the clean water in the slurry," says De Villiers.

Apart from chrome tailings, Multotec's filter presses have been used effectively in copper sulphide, copper oxide, coal, gold sludge, scrubber effluent and water treatment sludge applications. The company's range of equipment and depth of

technical expertise allows turnkey solutions, which include the various items of auxiliary equipment around the filter press.

The future

Commenting on some of the trends in wet processing, FLSmidth's Douglas says the sustainability conversation in the mining industry has matured. It has moved from a general acknowledgment that mining must become more sustainable to a point where the industry recognises that it is now a prerequisite for doing business.

"Sustainable practices are increasingly non-negotiable in order to secure investment, meet society's evolving expectations, gain a social licence to operate and to ultimately ensure shareholder value," he says.

FLSmidth is focused on all areas of the

flowsheet to address the three key areas of MissionZero – water waste, energy waste and emissions. The company is developing Reflux flotation technologies, both for fast flotation and coarse flotation, to minimise water requirements and footprint.

For coarse flotation, FLSmidth's CoarseAir, will provide efficient metallurgical recovery at a larger size than conventional flotation can achieve. A deposit that can benefit from this technology would require less comminution energy, as well as lower the OPEX and CAPEX of tailings solutions, by allowing a coarser grind size. FLSmidth continues to offer dry comminution technology such as the HPGR that can eliminate water addition upfront.

Kwatani's Mayhew-Ridgers says although screening plays a minor role in the management of water in a plant, Kwatani's view is that the ideal solution lies in reducing the amount of reject material processed by water.

"This can be achieved by eliminating the reject material in the upstream processes. For this reason, Kwatani is closely associated with world leaders in ore sorting technology because we believe this will definitely form part of the future mining improvement solutions," he says.

In conclusion, Multotec's De Villiers says there is already more pressure from authorities for mines to use less water and ensure used water is treated instead of stored in tailings dams, and he sees this trend strengthening.

"We also believe that the majority of water treatment projects in the future will be driven by SHE departments and not by operations as was typically the case in the past," concludes De Villiers. 🌱

Material placement attachments can reduce maintenance by connecting to the engine and hydraulics of common, proven workhorses, such as skid steers and wheel loaders.



RECONSTRUCTING ROADBUILDING

Roads are perhaps the most crucial piece of infrastructure around the world and one of the greatest technological achievements of mankind. Ironically, the glistening asphalt of an open road cues daydreams of escaping technology: windows down, tyres humming and freedom. But trying to keep up with the billions of people using one of the world's oldest industrial advancements to escape their modern technology tethers has left road crews in a scramble. *By Lynn Marsh, president of Road Widener LLC.*

The rising demand placed on roads is steadily exceeding road crews' capacity to maintain, let alone improve, roadways. Between 2008 and 2017, the United States highways in poor condition rose 25% which has significantly grown the demand to complete road repair projects year after year. According to the American Society of Civil Engineers, vehicles travelled more than 5,1-trillion km on US roadways in 2019.

Road repair projects are on the rise, but limited budgets require a re-evaluation of methods and efficiency to

ensure the available funds can stretch far enough. With crews facing a growing backlog of jobs, contractors are looking for ways to improve efficiency and get more done with the same amount of time and workers. However, some entities worry that learning new technology may result in lost time. That's where equipment attachments come into play.

Attachments provide a realistic, effective solution by utilising equipment that contractors are already familiar with. By changing workflow, minimising maintenance, lowering equipment cost, allowing for



Some attachments can even dispense up to 20 t of aggregate in under 10 minutes.

QUICK TAKE	
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smarter labour and increasing ROI. These new attachments are changing the foundational methods of road construction that have traditionally left road crews in the dust. Here's how.

A new method

Road construction tasks such as backfilling and aggregate placement have typically been viewed as a four-step process. Roadway materials are piled on

the road, scraped into place, compacted and then crews sweep and clean what remains off the road. Although larger machines and added crew members can help complete projects, another perspective to increase efficiency and safety is to minimise the number of steps in the process with the use of material placement attachments, which will also cut down on labour.

Material placement attachments take the complex four-step process using expensive equipment and simplify it. With this method, a single operator connects their skid steer, loader or other common host machine to the attachment and loads road material into the hopper at the top. Then, the operator drives alongside the road as material feeds down the hopper onto a conveyor which then carries the material to the edge of the attachment, dispensing it through an adjustable width opening exactly where it's needed.

Some attachments can even dispense up to 20 t of aggregate in under 10 minutes with all machine adjustments made by a single crewmember from inside the host machine using a remote control. To further increase the efficiency of material placement attachments, some manufacturers offer dual and single, left or right side, dispensing configurations to take on numerous roadways around the world.

Streamlining the process saves money and makes money. Crews can not only do more work in a day but do more with their budget by cutting out steps without adding more self-propelled machines or workers. And those savings continue into the future with a drastically lower cost of ownership when compared to self-propelled machines.

Reducing by attaching

Traditional self-propelled machines see most of their maintenance downtime and costs from engine, transmission and associated parts repairs. However, attachment efficiency truly shines when considering these profits lost to maintenance.

In an effort to reduce maintenance, material placement attachments can connect to the engine and hydraulics of common, proven workhorses, such as skid steers and loaders (wheel and tracked). In the case a host machine needs to be serviced, crews can quickly and easily hook up the attachment to another machine. Without an engine or transmission of their own to upkeep, these attachments have the power to reduce maintenance by up to 90% with just a few grease fittings to look after.



Contractors report up to 50% savings in labour when switching to material placement attachments, which could potentially double a crew's work capacity.

When considering this type of equipment, look for manufacturers that offer an optional universal mounting plate and easy hydraulic connections for their attachments and if they can connect to any host machine in a fleet. One advantage of choosing an attachment with a compact design means less

parts to keep track of and less transportation requirements and jobsite clutter. Another benefit is the ability to conveniently fit the attachments on the same trailer as the host machine to be transported to and from jobsites.

Reducing maintenance reduces downtime, ultimately providing

crews with the opportunities to take on more jobs and save money. Saving money during the process pays back an owner throughout the season, but what about out the door?

Savings from the get-go

Engines, transmissions and driveshafts. These high maintenance parts are an expensive, but necessary, piece for jobsites. The addition of material placement attachments help combat expenses by connecting low-cost, essentially maintenance-free hydraulic hook-ups to a host machine which then powers the attachment.

Cutting out the unnecessary parts slashes prices by up to 80% and allows contractors to invest in the host machines they know will support their fleet from multiple angles, not the paving machines that see months of off season. And the host machine to power the attachment? These common machines cost pennies on the dollar when compared to dedicated, single function road construction machines. Not to mention, most contractors probably have multiple machines that would excel as a host machine already in their fleet.

Overall, material placement attachments are low-maintenance and cost significantly less than self-propelled machines but also provide savings by repurposing labour.

Smart labour, not less labour

Remaking road construction by utilizing attachments reduces unnecessary steps, lessens the amount of equipment needed and drastically lowers maintenance requirements, but that doesn't mean crewmembers await a similar fate. Contractors now have the freedom to assign these crewmembers to different tasks that benefit the jobsite, and in times when labour is scarce, a way to keep getting work done.


The freedom that efficiency provides allows contractors to put crews to work in areas they didn't have the capacity to work in before and expand their road construction operations. Contractors report up to 50% savings in labour which could potentially double a crew's work capacity when using road construction attachments. In addition to that, labour savings can benefit crews from a safety perspective, as well.

It's one thing for a machine to go down, but what about a crewmember? Road construction is a high-risk job on the best of days, and reflective markings and cones only go so far on narrow roadways. Crowding numerous crewmembers around a roadside to spread-out materials or to make machine adjustments is an unnecessary risk. However, utilising attachments that cut out multiple steps in the process takes crewmembers out of harm's way. Additionally, remote-controlled attachments allow the host machine operator to remain in the cab while adjusting the dispensing speed and machine positioning.


A way forward

The poor conditions of roadways across the world and the limitations of traditional machinery are inspiring equipment innovations. The new road construction methods that material placement attachments offer are proving to be assets not just in times of infrastructure crisis but for creating a system of sustainable roadway management. 🌱


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To truly maximise a processing plant's efficiency, unnecessary crushing must be minimised or eliminated.



THE CRUSHING COSTS OF POOR SCREENING

Efficient crushing is a critical factor in a screening plant's profitability. Crushers are a significant investment, both to own and to operate, and the entire process depends on the crusher to work effectively. But what often goes unnoticed – and frankly, undiagnosed – is the effect that poor screening can have on an operation's profits. Inefficient screening silently tallies up costs as material is needlessly recirculated through the crusher. By *Serge Raymond*, MAJOR product specialist.

To truly maximise a processing plant's efficiency, unnecessary crushing must be minimised or eliminated. To do this, plant operators must understand how recirculation could be hurting their profitability, and what they can do to minimise it.

Material recirculation

If the screen box is not doing its job well,

material that should have fallen through the screen media ends up circulating back to the crusher to be crushed again. Recirculation is hard to detect and even harder to measure, making it difficult to put a value on. It can wreak havoc on an operation's bottom line but never be identified as the problem. There are a number of ways it can cost a plant money.

The obvious consideration is wear

and tear on the crusher. Crushers are expensive to fix and replace – up to three times the cost of replacing a screen box. Material recirculated through the crusher accelerates the machine's retirement, bringing that replacement expense to bear more quickly than would have been required.

Unnecessary work for the crusher also hastens its service intervals and causes



Efficient crushing is a critical factor in a screening plant's profitability.

wear parts to deplete more quickly. No matter the crusher type – impact, cone or jaw – material recirculation causes the wear parts to be replaced more often, and without benefit of adding revenue to the business.

One of the biggest issues of recirculation is lost revenue. This pattern reduces the amount of near-size material – the most valuable to an operation – being produced. The producer winds up taking a double hit – one from the expense of crushing the material a second time, and another from the loss in revenue and reputation from producing less near-size material.

Preventing the problem

Screen media choice is often the single biggest factor in improving screening efficiency. Where most media falls short is in delivering efficient stratification. Some producers use high-vibration wire screens, which are strategically designed to promote material stratification and offer exceptional screening performance.

High-vibration screen media magnifies the screen box's own vibration. Independently vibrating wires run along the full length of the screen media, increasing the vibration frequency. Consider that a typical screen box vibrates between 600 and 1 200 strokes per minute, with high-frequency machines reaching in excess of 4 000. Because high-vibration screens vibrate independently of the screen box, the wires can reach frequencies of 6 000 to 10 000 cycles per minute — up to 13 times greater than that of a standard vibrating screen with traditional media.

This high vibration accelerates material stratification, causing coarse material to rise to the top of the material bed faster. Fines and near-size material comes in contact with the screen much faster. This combined with a wide material spread – again, thanks to the extreme vibration – puts fines and near-size material in contact with the screen for a much longer time period, drastically improving the screen's effectiveness and reducing the amount of material sent back to the crusher unnecessarily.

High-vibration screen media can be a game-changing solution for operations struggling with productivity. Recirculation is a frustrating drain on efficiency, racking up crushing costs and diminishing the quality of the final product. Reducing or eliminating recirculation with more efficient screening is a relatively low-investment solution for a potentially high-dollar problem. 🌀



To truly maximise a processing plant's efficiency, unnecessary crushing must be minimised or eliminated



To do this, plant operators must understand how recirculation could be hurting their profitability, and what they can do to minimise it



If the screen box is not doing its job well, material that should have fallen through the screen media ends up circulating back to the crusher to be crushed again



Screen media choice is often the single biggest factor in improving screening efficiency

TAKE

QUICK

Standardisation can significantly impact efficiency and profits for 10, 20 or even 50 years down the road.



SUCCESSING WITH STANDARDISATION

For fleet owners looking to standardise their operation, selecting a trailer manufacturer might feel more like picking a favourite sports team than a strategic move to maximise hauling equipment investments. To some extent, it is. By Troy Geisler, vice president of sales and marketing, Talbert Manufacturing.

Teams with dedicated fans play smart and deliver results year after year. Similarly, original equipment manufacturers (OEMs) who inspire “die-hard” customer loyalty have a proven track record for durable, high-quality products. For savvy fleet owners, who base decisions on spec more than brand, these manufacturers also provide diverse product lines and exceptional customer service that make it easy to jump on the bandwagon.

But how do you pick the right team for your operation? Some equipment needs might be immediate, but the real value of standardisation lies in a long-term partnership. Unlike sports affiliation, standardisation can significantly impact efficiency and profits for 10, 20 or even 50 years down the road. Fleet owners should carefully weigh their options before making a decision. Not every manufacturer has what it takes to become a dynasty, so to speak, and no amount of rally caps can turn around a poor investment.

Here are four key stats to consider for optimising trailer fleet standardisation.

Diverse product line

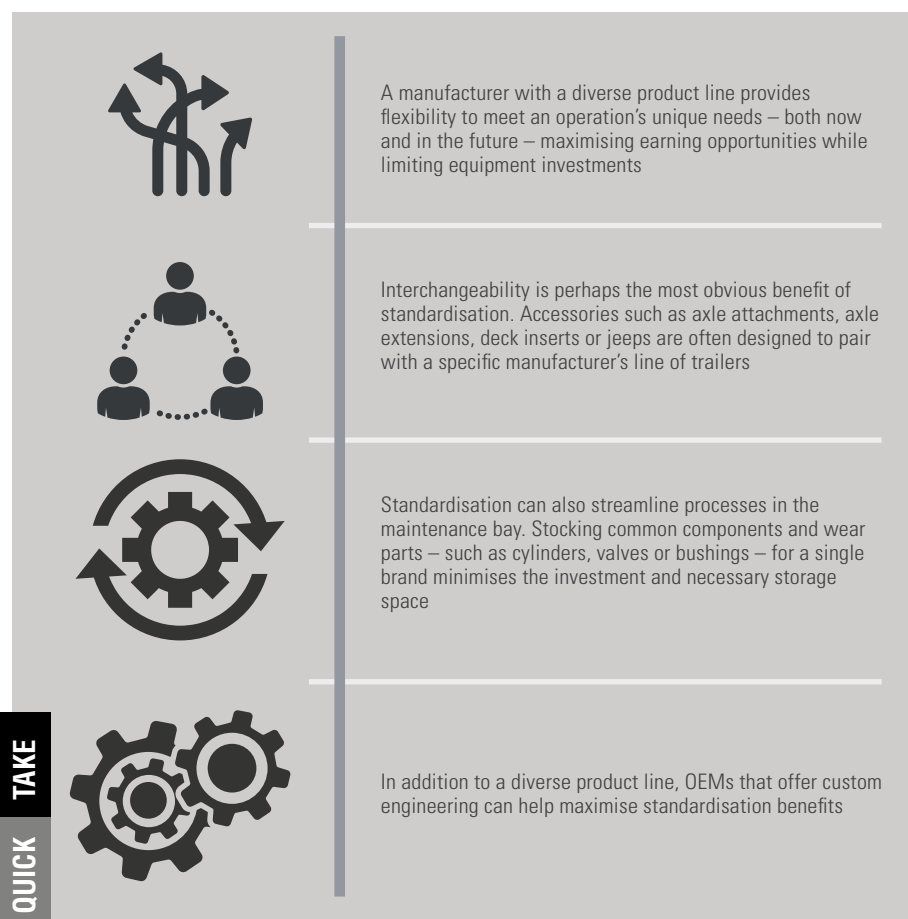
Consider this: a sports franchise with a deep roster of high-quality players has a better chance of making it to the championship year after year. The same is true when it comes to equipment standardisation. A manufacturer with a diverse product line provides flexibility to meet an operation’s unique needs – both now and in the future – maximising earning opportunities while limiting equipment investments.

Interchangeability is perhaps the most obvious benefit of standardisation. Accessories such as axle attachments, axle extensions, deck inserts or jeeps are often designed to pair with a specific manufacturer’s line of trailers. Purchasing accessories for each individual trailer results in unnecessary expenditures and a lot of equipment lying around the yard. Working with a single manufacturer, on the other hand, means operators can limit accessory investment without limiting potential through proper planning.

For example, an operation might have two lowboys – a 55-t and a 60-t – they would like to run with a fourth axle. It’s important to note that these trailers must be designed to accept a fourth axle from the very beginning, which is why thinking ahead is important. Simply adding another



A manufacturer with a diverse product line provides flexibility to meet an operation's unique needs.



axle onto a trailer that wasn't designed for it does not increase capacity – and doing so can lead to stress and premature failure. However, if the trailers were designed by the same manufacturer and can each accept a fourth axle, the operator only needs to purchase a single axle attachment to optimise capacity on both trailers. This represents a significant savings.

Standardisation can also streamline

processes in the maintenance bay. Stocking common components and wear parts – such as cylinders, valves or bushings – for a single brand minimises the investment and necessary storage space, since manufacturers will often use the same wearables throughout their product line. Common parts paired with familiar design elements across multiple trailers can also increase repair and maintenance efficiency.

From air and electrical to tyre cylinders, working with a single manufacturer minimises the number of complex systems technicians need to understand.

On the road and in the yard, similarity between trailers increases ease of use and operator comfort. For example, the process for attaching a removable gooseneck varies slightly from manufacturer to manufacturer. Ensuring safe, efficient completion of this common task is vital. And, if it's done the same way every time, operators save a good deal of time and worry.

Plus, less training is required. In the long run, as employees become familiar with the equipment, they can perform more efficiently as well as identify problems early when the trailer is not behaving as it should.

Custom engineering

In addition to a diverse product line, OEMs that offer custom engineering can help maximise standardisation benefits. It all comes down to planning ahead. Working with the right manufacturer can provide equipment that meets current needs but also allows for future growth, resulting in better ROI for the long haul.

For a small operation just starting out, funds might be tight. An off-the-lot trailer might provide the capacity needed for current applications, but what happens when it's time to grow? They can't just add an axle to increase the capacity. And maybe they are not ready to invest in another trailer, leaving them stuck.

As in the above example, flexibility can be designed into a trailer, but it must be done at the outset to minimise the trailer's final weight. This is where working with established OEMs makes a difference. There is nothing that says all the elements of a custom-designed trailer have to be built right away. Instead, with the future in mind, operators and OEMs can work together to design a trailer that will meet not only immediate hauling needs but also those five years down the road. The customer can choose the trailer as a stand-alone purchase initially. As the operation grows and equipment needs change, they can purchase additional components, such as axles, deck inserts or jeeps, to accommodate new applications.

Industry leading manufactures offer a number of versatile trailer designs that allow for growth and overall efficiency from the get-go. Certain top-tier manufacturers feature trailers with variable capacity to increase operators' versatility while limiting permitting costs and the need for additional equipment. With these trailers, a 55-t spread axle configuration with a nitro-boosted axle extension can increase to 60-t capacity in close coupled configurations.



On the road and in the yard, similarity between trailers increases ease of use and operator comfort.

Certain manufacturers also offer modular trailer options. This custom design provides optimum versatility through a mix-and-match type setup that allows operators to add a custom deck insert between the deck and rear bridge or swap out deck styles all together. Additionally, it provides space for shimming, allowing for ideal weight distribution. This minimises the risk of overloading axles, which can stress components and puts the operator at risk of fines. Again, overall capacity and intended use must be discussed with the manufacturer during the design phase.

High-quality parts

As a long-term, forward-thinking strategy, standardisation only works if the trailer lasts. Therefore, it's important to partner with an OEM that uses premier parts and components that can stand up to challenging conditions.

Look for a manufacturing partner that uses materials such as heavy-duty T-1, 100,000-psi minimum-yield steel. This material allows the most capacity with the smallest impact on trailer weight for extreme durability and longevity. Apitong flooring is another high-quality component to be on the lookout for. This tightly woven and incredibly dense South Asian wood is less susceptible to chipping and cracking, so it stands up better than traditional oak and pine decking and provides more

traction than metal. Investing in higher-quality materials and components can double the life of the trailer, significantly enhancing ROI.

Quality components also play a significant role in overall safety, which leads back to longevity. Safety ratings illustrate how well the trailer is equipped to deal with the extra stress that comes from things like bumps, chuckholes and railroad tracks as it travels down the road. These bumps cause the trailer to experience a momentary magnification of payload. In general, trailers can expect an average magnification of payload ratio 1.8 to 1. Safety ratings range from no margin to up to 2.5 to 1, an industry high.

Heavy-haul trailers built with lower-quality materials offer a lower safety rating, are more prone to premature damage and require more maintenance. They simply can't provide long-term dependability – a key consideration for standardisation – and operators end up with less working time and a lower return over the life of the trailer. On the other end of the spectrum, trailers designed with extra margin in the safety rating will experience less stress, wear and damage, resulting in reduced maintenance costs over time.

Customer service

Finally, to ensure long-term standardisation success, operators should look past the trailer and consider the brand itself –

specifically its commitment to customer service. There is no point planning for 10 years down the road if getting service or support for the here and now is impossible, right?

In addition to dependable, high-quality trailers, look for a manufacturer with a knowledgeable and expansive dealer network. Matching an operation's unique needs to the right trailer requires answering a lot of questions, but it's the only way to find long-term success. Having someone who can ask the right questions ensures the trailer will meet not only today's requirements, but tomorrow's needs as well.

In it for the long haul

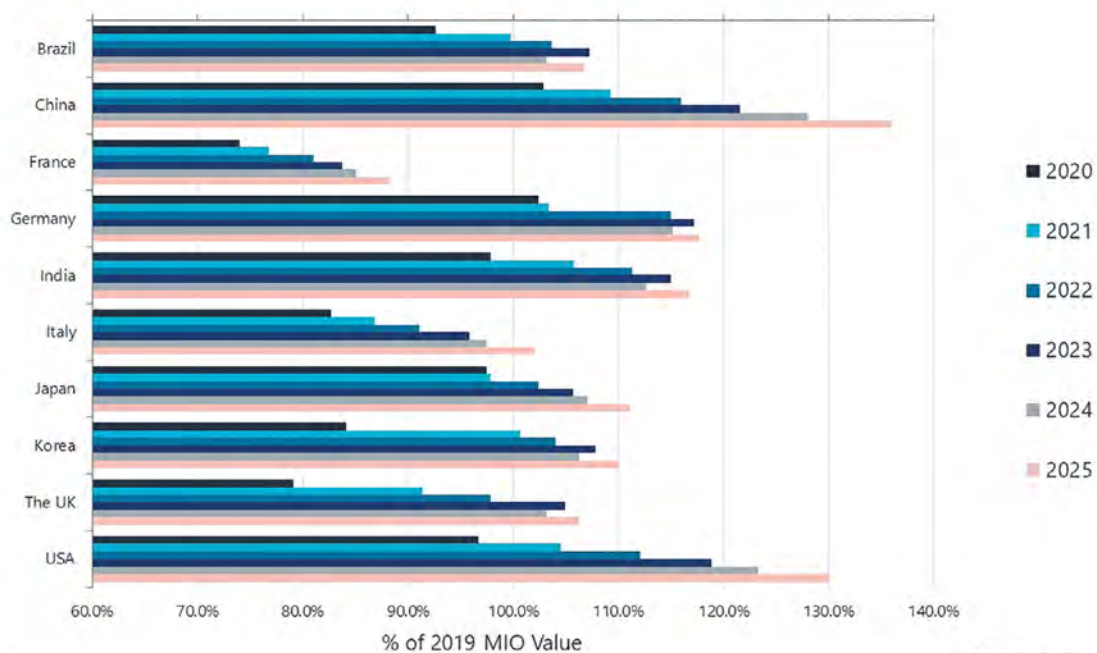
Standardisation should be part of every fleet owner's playbook. It provides a number of benefits that boost efficiency and increase profits. Even if an operation starts out small, nobody plans on staying small. And while picking up trailers here and there based on need is an option, a fleet of mixed manufacturers will never provide the flexibility or ease of use that comes with standardisation. Working with a manufacturer that offers a range of safe, durable trailers – from 60-t lowboys to 10-t tag-a-longs – can result in unlimited growth potential.

Finding a manufacturing partner is about more than picking a favourite team – it's about the long-term benefits standardisation can provide. 🌟

FULL RECOVERY FOR GLOBAL MACHINERY PRODUCTION IN 2021

In times of economic turmoil, the machinery manufacturing sector tends to be volatile. That's because uncertain times make factory managers inclined to postpone investment in expensive new kit. With automotive production seizing up in 2020, the machine tools market shrunk by 18% and many other categories of machinery saw sales diminish to well below 2019 levels. By *Adrian Lloyd*, CEO of Interact Analysis.

Time to recover for materials handling equipment - top 10 regions



Source: Interact Analysis

© Interact Analysis 2021

The materials handling equipment market is heading for a swift recovery.

But, in the case of the pandemic, the times have been so unusual, and the impacts so unpredictable, that sales in some machinery categories have grown strongly. In particular, the boom in household electronics sales driven by locked down populations, coupled with the earlier than expected return to production of the automotive sector, saw sales in semiconductor and electronics machinery grow by 8% in 2020.

Growth leaders

Our research shows that the global machinery market was worth US\$1,98-trillion in 2020. This constituted YoY growth of about -6%. But we expect to see a 6,2% rebound in 2021 up to US\$2,11-trillion. Materials handling equipment is the largest segment, with a 2020 value of US\$275-billion.

Our forecasts for the total machinery sector out to 2025 put the three highest

CAGRs as mining machinery (5,3%), farming machinery (5,1%) and textile machinery (4,5%). Multi-industry machinery will have a CAGR of 3,8% over the forecast period, with materials handling equipment performing particularly well within that category (CAGR 4,7%), owing to the booming warehousing and logistics sectors.

From a regional perspective, the global machinery sector is highly consolidated, with the top five regions accounting for over 70% of global market value. China alone accounts for over 40% of the world's machinery production. In terms of CAGR out to 2025, the USA will lead the way with a CAGR of 4.9%, followed by Italy and India with CAGRs of 4% and 3,7% respectively.

Materials handling

Materials handling equipment can be split into four separate sub-groups: conveyors, which take up 30% of the market, escalators and lifts (30%), cranes and hoists (25%) and

forklifts and other industrial trucks (15%). The fortunes of the materials handling equipment (MHE) sector are closely linked to those of general industrial production. This means that, as the global recovery accelerates, MHE will see concurrent growth. And this growth will be from a relatively strong base, given that it saw modest contraction in 2020 of only -3,8%. The sector will see 6% growth in 2021. One of the motors behind this will be the drive for greater industrial automation. Another is the sector's universality: MHE is used across a wide range of industrial sectors.

Regionally, the biggest producers of MHE are China (43,6% in 2019), the United States (10,8%) and Japan (8,5%). We expect most of the top ten regions to recover by 2025. For example, the market in China grew by a modest 3% in 2020, and will see 6,2% growth in 2021. In contrast, the data shows that the worst performer on most MHE counts will be France. 🌟

Business as usual as Kwatani/Sandvik transaction closes

Business as usual is how Kim Schoepflin CEO of Kwatani describes the news of the closing date of the transaction whereby Sandvik Rock Processing Solutions and Kwatani signed an agreement for the multi-national Sandvik Group to acquire the shares of this 45-year-old leading vibrating screen and feeder original equipment manufacturer (OEM).

Schoepflin says when the exciting transaction, which was subject to regulatory approvals and customary conditions, was made known to the mining and materials handling industries earlier this year it was exceptionally well received by the markets, from both potential and existing customers.

"Kwatani has operated its world class production facility in South Africa for more than 45 years, and both Sandvik and Kwatani are technology leaders so bringing our combined resources to customers will be of enormous benefit," she says.

"What is most significant for the South African industry is that the collaboration is aligned with our government's industrialization strategy. Furthermore, Kwatani is known for its commitment to compliance

with the South African Mining Charter and we are a proudly Level 2 B-BBEE company."

Add to this, and a game changing move for the South African economy is that the Kwatani facility is set to become the global engineering and manufacturing base for vibrating screens and feeders for both local and international customers. The internationally recognised Kwatani brand, with its promise of being engineered for tonnage, will remain unchanged and the Kwatani brand will continue to be used across Africa while products sold internationally will be sold through the Sandvik sales channels under the Kwatani product name.

Schoepflin says that also exciting for the market is that Sandvik will further develop the Kwatani vibrating equipment brand globally. "This will see increased access to the Kwatani product through Sandvik's global distribution network and customers will benefit by having access to a vastly increased customer service network."

"Sandvik will also, through its global technology resources, provide access to monitoring and automation processes as well as access to its extensive R&D facilities



Kim Schoepflin, CEO of Kwatani.

which include simulators."

This, Schoepflin says, will provide opportunities for driving efficiency arising from the advance of artificial intelligence in the Fourth Industrial Revolution and will significantly empower the process of cost effective customisation. 🌟

Cummins' global supply-chain network offers a lifeline to the mining industry

With the bulk of its business in Africa driven by mining, Cummins has continued to support its major mining clients throughout the COVID-19 pandemic. From blasthole drills and front-end loaders to 360 t haul trucks and 1 000 t excavators, Cummins' mining platform delivers engine power from 85 hp to 3 500 hp. This is coupled with 80 years' experience in the mining industry globally, developing fuel-efficient and emissions-compliant technology to ensure the lowest cost-per-ton in the most demanding applications.

The mining industry has kept the pedal to the metal throughout the COVID-19 pandemic, notes Dave Rehse, Director Mining Africa, Cummins Africa Middle East. "Business has largely carried on as usual. We are just entering some very good rebuild cycles right now. Overall, I would say that the industry has remained buoyant throughout this difficult period."

Specific commodity sectors such as diamonds are showing green shoots, while the open-cast mining sector has also proven quite resilient. Having worked at Cummins for over 30 years, of which the bulk has been in the mining industry, Rehse highlights that a particular challenge has been the restrictions on travel and having to deal with problems on client sites remotely. However, these restrictions are easing



Cummins has ensured a consistent supply of parts and spares during the global pandemic.

globally, which is signalling a slow return to normal for the mining industry.

A particular achievement for Cummins during the pandemic has been ensuring a consistent supply of parts and spares, despite the global constraints in this regard, stresses Marco Gouveia, Parts Marketing Director, Cummins Africa Middle East. "We have manufacturing facilities worldwide, and different countries have been impacted by COVID-19 at different times, and also responded differently in how they have dealt with the pandemic."

A major headache has simply been circulating manufactured goods around the

globe, with airplane and shipping space at a premium due to a reduced number of flights and even a shortage of shipping containers to contend with. Despite these challenges, Cummins' resilient supply chain network has ensured a steady supply of parts and spares globally.

"It is imperative that our mining clients are up and running at all times, as any parts-supply issues can impact rebuild or service times and have a major impact on uptime. In this regard, the global Cummins team has done a sterling job in literally keeping our engines running worldwide," adds Rehse. 🌟

Increased productivity with Next Gen Cat 966 and 972 wheel loaders

Bringing a host of standard technologies to the 7- to 9-tonne wheel loader line, the updated Cat 966 and 972 wheel loader series boost operator efficiency. The 966 and 972 models deliver consistently high bucket fill factors to increase productivity by up to 10%. Their next generation design extends fluid and filter change intervals to lower maintenance costs up to 15% when compared to the previous models.

Both models in the updated 966 and 972 loader series feature standard Cat Payload with Assist for accurate weighing of bucket payloads, so operators can load to target the first time every time. Real-time data is fed to the operator display and allows manual tip-off function to improve final bucket adjustments and truck load accuracy.

The new Cat Autodig with Auto Set Tyres delivers consistently high bucket fill factors for the updated medium wheel loaders. Fully automating bucket loading, Autodig improves fill factors and decreases loading time. Working in conjunction with Autodig, Auto Set Tyres promotes proper loading techniques to significantly reduce tire slip and wear.

Offering the ability to set customised profiles for customer-specific applications,

new Application Profiles sets multiple machine parameters with the press of one button to optimize settings for the job. Selectable on-screen Job Aids, along with a streamlined new controls layout, facilitates loader operation, allowing operators of all experience levels to be more productive.

Optional Cat technologies help to further increase productivity and operation profitability of the updated series. Cat Advanced Payload with Assist offers Tip Off Assist to automatically adjust the final bucket load to match hauling unit target, enhanced lists management, site integration and extended scale features. The available Cat Productivity subscription provides detailed and comprehensive actionable information for the site off-board on your smartphone, tablet, or computer.

The Next Generation 966 and 972 series design extends hydraulic system maintenance intervals, so the loaders spend more time at work. An integrated optional Autolube reduces daily maintenance and increases component service life, while convenient access to hydraulic and electric service centres makes servicing the loaders fast and easy. Combined, these design up-



dates reduce maintenance costs up to 15% for the Cat 966 and 972 models.

Technology also plays a role in improving loader servicing. Helping to manage fleet location, hours and maintenance schedules, the Cat App provides alerts for required maintenance and assists with requesting service from the local Cat dealer. Remote Troubleshoot connects the machine to the dealer's service department via the internet to quickly diagnose fault codes without on-machine cable connection. Additionally, Remote Flash ensures the wheel loaders are operating with the most up-to-date software without impacting the production schedule. 🌐

Training mechanised operators enters virtual age

Virtual reality, simulation and mock-ups are among the range of learning platforms that the Murray & Roberts Cementation Training Academy (MRTA) is using to raise the bar in training operators of mechanised equipment.

The impact of these enhanced training techniques is not just improved safety and productivity in mining operations, but also a business cost awareness, says Tony Pretorius, education, training and development (ETD) executive at Murray & Roberts Cementation.

"Our unique approach to training mechanised operators takes the process well beyond the regulated requirements," says Pretorius. After covering the psycho-motor skills, induction, legal and technical skills, and the relevant standards and procedures of the mine, MRTA takes an innovative approach to the more practical elements of the training. For instance, learners are placed in a virtual environment to assess the condition of equipment, followed by videos which show how this equipment operates in the workplace and how it is to be inspected.

"They then progress to the use of simulators, where we can monitor three main areas of proficiency: health and safety; machine appreciation; and productivity

enhancement," he says.

"The academy's selection of simulators for this purpose includes the Sandvik DD321 drill rig, the Sandvik DD311 bolter, the Sandvik 514 load-haul dumper and the Sandvik 517 dump truck."

He notes that a compact, mobile and immersive virtual reality drill rig simulator has also been introduced, allowing learners to experience a range of tasks. These include accurate indexing according to surveyed positions, different face conditions and various drill and blast patterns. It also simulates emergency triggers, and highlights where the operator's drilling behaviour is sub-standard, showing the consequences of this for boom and drilling consumables.

"Operators can also receive feedback simulations, where the cost of consumables and operational disruptions are explained," he says.

The learners can then be introduced to the mock-up environment at MRTA, where they can have the real experience of ma-



Virtual reality and simulation are among the range of learning platforms that the Murray & Roberts Cementation Training Academy is using to raise the bar in training operators of mechanised equipment.

chine operation in a confined space. Here, they are required to demonstrate applied capability in emergency preparedness, machine inspections and brake tests as well as machine set-up and operations.

"What is important for all operators to understand is how their behaviour impacts on mine costs and productivity," says Pretorius. "This is one of the key areas where our interventions distinguish us in the training space."

He says only after this intensive preparation are the learners placed in a workplace where they can progress to the required applied competency levels in a safe manner. 🌐

Epiroc launches Mobius for Drills, a data hub for mine operations

Epiroc, a leading productivity partner for the mining and infrastructure industries, in partnership with ASI Mining LLC, has introduced Mobius for Drills, a new platform to convert data into useful, actionable information. Mobius for Drills will lead mines towards automation and connectivity.

Featuring embedded artificial intelligence, the user-friendly Mobius system enables multi-vehicle command, control and monitoring to maximise productivity and safety.

"We think of it as a tool to directly support making quick and effective interrelated decisions. Mines can get greater productivity and economies of scale as a single operator controls multiple remote and autonomous vehicles. Mobius for Drills is designed to tie the whole value chain together," says Tyler Berens, Automation director, Surface Mining, Epiroc Surface division.

Mobius for Drills displays data in an easy-to-use layout to map drill usage, evaluate statistics, track consumables and compare planned outcomes against actual results.

"Mobius for Drills is an ideal management tool because of all the support it provides in decision making, but Mobius for Drills also helps with driller training, so it is useful for the whole workforce," adds Christopher Blignaut, product owner – Data Solutions, Epiroc Surface division.

By providing a single platform for all stakeholders within the drilling operation, users can quickly navigate the information, filter it to their needs and streamline the decision-making process, day-to-day or over time.

An added value to Mobius for Drills is its ability to work across fleets with drills from multiple manufacturers, condensing all sources of information. Mobius for Drills may be used as a Fleet Management System or integrate with a mine's existing system.

"Mobius for Drills enhances engagement of all stakeholders with the drilling process. It provides valuable insight at each stage of the drilling process through a drill plan builder for planning, situational awareness for drill controllers and reporting for supervisors. It is a



Featuring embedded artificial intelligence, the user-friendly Mobius system enables multi-vehicle command, control and monitoring to maximise productivity and safety.

scalable product, which accommodates evolving needs of a mine," explains Mahmood Hassan, Engineering Project manager – Automation, Epiroc Surface division.

Mobius for Drills imports drill plans, monitors drilling and creates the reports over a secure system on site or remotely. It supports manned operations, teleoperation, semi- and fully-autonomous modes and covers applications from drill and blast through autonomous haulage systems.

Mobius for Drills is designed to help mines improve control of their operations, but in a completely new way. 🌐

Compact Condra crane delivers higher than normal lifting height

Condra has manufactured and delivered a 30/10-t overhead crane designed to marry two mutually opposing tender specifications: high lift-height and tight overall dimension.

The double-girder electric overhead travelling crane is for dragline house maintenance. A 30 t crab-mounted main hoist will service hydraulic cylinders, motors and gearboxes within the house while an auxiliary 10-t underslung hoist executes additional duties, including external loading and unloading of equipment.

Condra delivered the machine on December 9. The order was received in August last year. Crane design was made complex by two customer specifications: first, the need for the main hoist to deliver a higher than normal lifting height measured as a percentage of the available vertical dimension; second, the requirement for overall dimensions to be sufficiently compact to enable the working crane to move in and out of the existing crane aperture in the wall of the dragline house.

These two design requirements run contrary to one another in that a greater lift

height is usually achieved by designing a physically bigger hoist working from a larger crane.

Condra's machine will clear the aperture frame with just 50 mm to spare. The specification was met by careful design of three distinct aspects. First, the main hoist was designed around a high-tensile rope with reduced diameter, allowing a smaller rope-drum and more compact hoist. Second, smaller wheels, suitably hardened, were used on the long and cross-travels of the crane, driven by more powerful motors. Third, girder webs were made smaller and combined with top and bottom flanges of thicker steel plate to maintain deflection criteria.

"In a nutshell, we met the customer specification by designing key crane elements to be smaller but stronger," explains Condra MD Marc Kleiner.

"All credit for a successful outcome must go to our design office, which worked hard to meet this demanding specification."

Competition for the contract was stiff. Tenders representing most major crane brands were submitted. However, Condra



The double-girder electric overhead travelling crane is for dragline house maintenance.

proved better able than rival companies to meet the complex and conflicting design criteria.

The newly delivered crane features digital load cell read-outs, remote control, lights, and a buffer to protect the underslung hoist against damage by other machinery working in the confined space of the dragline house. It joins a long list of lifting equipment manufactured by this Johannesburg-based company for mining applications over the past fifty-five years. 🌐

WearCheck embraces communication tech

One of the latest technological innovations employed by condition monitoring specialist, WearCheck, is enabling the company's sophisticated online system to send customers their reports via WhatsApp.

MD Neil Robinson says WearCheck is constantly exploring how technology can enhance the customer experience as well as continuously improving condition monitoring techniques.

WearCheck's IT manager Eddie Perumal explains how it works, "WhatsApp has proven its convenience as an integral part of everyone's daily life, and it adds value by allowing us to communicate in real-time with maintenance teams who may be on the factory floor with their mobile phone, rather than waiting until they are sitting behind a desk checking emails. Therefore, we felt it was fitting to incorporate the option of communicating with our customers via WhatsApp," he says.

Customers can select from three message options – one page report, two page report or status. Reports include fleet information, problem type and diagnosis. This feature applies to critical and urgent samples.

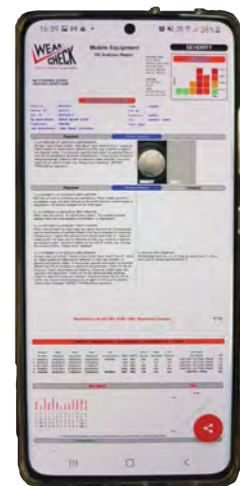
Another powerful reporting tool is Wear-

Check Online, a web-based system which allows customers to view their sample report and fleet information, as well as submit their sample registration details and feedback.

WearCheck Online comes with a variety of features to assist customers to manage their oil analysis programme. Some of these include current samples list, which shows unread reports; print sampling labels using A4 self-adhesive labels; trend-based graphs, problem-type graphs, and pivot tables; component analysis - view the results of one or more components in a single graph; and basic user information for staff in the reporting hierarchy, including reports read, sample submissions, feedback entered.

Various search options and filters are available, including sample history and equipment or component searches. An extension to the online system – WearCheck's mobile app, which was pioneered four years ago – has been well received in the marketplace.

It offers similar features to the online system with the option to "Ask a diagnostician," where the customer can enquire about a specific sample. Customers can also use their mobile device to quickly scan



WearCheck's WhatsApp report.

their sample barcode.

Robinson concludes, "Many industries benefit from WearCheck's services, among them mining, earthmoving, industrial, transport, shipping, aviation and electrical operations. As optimal machine condition is critical in all these industries, and the WhatsApp service enables real-time maintenance issues to be shared, enabling instant decision-making, the new service will add enormous value to our condition monitoring services." 🌟

Cat 320 GX and 323 GX excavators deliver low maintenance and owning costs

Reliable performance at a lower cost are the hallmarks of the new Cat 320 GX and 323 GX hydraulic excavators. The new excavators feature classic Cat D Series quality coupled with modern upgrades, such as a high-performance hydraulic system and modern controls. Along with the enhanced 320 and 323 and standard 320 GC and 323 GC models, the new GX excavators give contractors even more choices to meet their needs.

Designed to meet a range of customer needs from maximum productivity to low cost-per-ton operation, the new GX models offer lower fuel consumption, reduced maintenance costs, and a low initial purchase price compared to Cat GC models for a fast payback. The 320 GX and 323 GX are up to 15% more fuel efficient than the 320D2 GC and 320D2 L in similar applications. An electronically controlled valve precisely directs hydraulic power where and when it is needed, boosting productivity. Maintaining the reliability and durability customers have come to expect from Cat excavators, the new GX series offer a lower initial purchase price than the other models but with more advanced features.

The choice of Power and Smart modes allows operators to manage fuel consump-

tion. Power mode provides full-time maximum output and productivity, while Smart mode automatically matches engine and hydraulic power to digging conditions to conserve fuel without impacting production. Automatic Engine Control (AEC) reduces engine speed when the machine is stationary to minimize fuel consumption.

These new excavator models benefit from the latest technical enhancements to reduce maintenance costs by up to 20% compared to the 320D2 GC and 320D2 L. Design improvements significantly extend maintenance intervals and provide easy access to consolidated filters. Hydraulic, air, and fuel filters feature increased capacity for longer life.

Service intervals for fuel filters extend from 500 to 1,000 hours, while the new hydraulic oil filter improves filtration performance and extends replacement intervals from 2,000 to 3,000 hours. Auto warm-up expedites hydraulic warming in cold temperatures to help improve component life.

The new 320 GX and 323 GX excavators feature grease sealed between track pins and bushings to deliver reliable undercarriage operation. Offering durable, field-prov-



The new GX models offer lower fuel consumption, reduced maintenance costs, and a low initial purchase price.

en designs with standard J-tips, multiple bucket designs and capacities are available to meet contractors' specific application need. Customers in certain regions can equip the buckets with optional Advansys tips that retain sharpness longer and can be quickly changed using a lug wrench.

A push of a button starts the new 320 GX and 323 GX excavators. The new high-resolution, 203-mm (8-in) touchscreen monitor allows operators to quickly navigate most machine settings, including joystick pattern and response. Operator ID allows operators to select power mode, joystick pattern and joystick response and restores them at login for a quick return to work. 🌟

Yanmar new premium red machines pave the way for a new era

Yanmar Compact Equipment has adopted an eye-catching premium red paint colour across all its machines globally. Premium red machines were first introduced in the North American market in 2020, and the rollout sees Yanmar's EMEA (Europe, Middle East, Africa), AOLA (Asia excl. Japan, Oceania, Latin America) and Japanese markets completing the metamorphosis. The new Premium red paint colour brings Yanmar's compact equipment in-line with Yanmar Group's image.

"Our dealers and our customers really like the new colour," states Jeff Pate, sales director, Yanmar Compact Equipment North America. "Everyone feels that Premium Red attracts attention on the jobsite, and just as the quality and reliability of our products stand out from the competition, in a sea of yellow competitive machines in North America, our Premium Red colour stands out too."

But the shift from the well-known Yanmar yellow is more than simply a cosmetic colour change. For Yanmar Compact Equipment, the symbolism of this change resonates on a deeper level.

"Yanmar Compact Equipment is on a journey of transformation," explains CEO Giuliano Parodi. "We aim to be a global leader in compact equipment and with the help of our dealer partners, deliver sustainable business solutions for our customers and the societies in which

they operate."

"Our acquisitions of the last few years are now fully integrated into a harmonised, Yanmar CE way of working, with common processes and customer focus right across our enlarged product and services portfolio. For us, premium red sends out a clear signal that we are one company with a clear product strategy. But our transformation goes far beyond our machines, we are challenging the way we think and the way we work, to transform our products, our business, and our brand to create even more value for our customers," adds Parodi.

In product transformation, Yanmar CE is currently evaluating several alternative fuel and powertrain technologies and recently unveiled its first electric mini excavator prototype, the new SV17e. Featuring the new premium red colour, the SV17e is aimed at customers in the European market in the 1,5 to 2 t segment.

"Our prototype is significant because it demonstrates our capability to bring the quality and reliability of our highly respected conventional engine technology into the arena of electrification," explains director Product Management EMEA, Cedric Durand. 🌱



The new Premium red paint colour brings Yanmar's compact equipment in-line with Yanmar Group's image.

Volvo CE develops full power of electric ecosystem with E-Worksite

A groundbreaking research project by Volvo Construction Equipment (Volvo CE) and partners to explore every aspect of the electric ecosystem is helping to deliver a complete site solution for real urban applications.

Together with multiple municipalities, cities and academic and industry partners, Volvo CE is thoroughly testing every part of how an electric machine is put to work from a system perspective – from charging infrastructure through to energy supply and more. The Electric Worksite (E-Worksite), which launched earlier this year in Gothenburg, Sweden, not only sets the global benchmark for electric jobsites but also tests electric machines' specific requirements across different tasks within a demanding urban environment.

It is a vital next step in the manufacturer's electrification journey and a testament to its commitment to achieving net zero value chain greenhouse gas emissions by 2040, as validated by the Science



Based Targets initiative.

Carolina Diez Ferrer, head of Advanced Engineering Programmes, at Volvo CE, says: "We are already delivering electric solutions that offer zero exhaust emissions, reduced noise, and a much more comfortable work environment, but that is only half the challenge. We are committed to also helping

our customers reach their own climate goals through complete site solutions with a holistic sustainable approach. This exciting partnership allows for a comprehensive investigation into the varied infrastructure and support system needs for electric machines to really perform to their best, no matter the task at hand." 🌱

BMG opens new branch in Maun, Botswana

BMG – Africa's leading engineering solutions specialist – has extended its service footprint in Botswana with the opening of a new branch in Maun in November 2021.

"BMG now has two dedicated branches in Botswana – one in Gaborone, which was established in 1998 to service and supply the southern part of the country and a new branch in Maun, that supports the northern region of Botswana," says Hein Ries, branch manager, BMG Maun. "The BMG Botswana team plays an integral role in optimising the productivity and operations of customers in all sectors in Botswana. These industries include mining, agriculture, automotive, food and beverage, as well as construction, manufacturing and repairs.

"Our team works closely with customers to investigate the source of problems and provides cost-efficient solutions for high efficiency of machinery, extended service

life of the system and minimal maintenance requirements.

"Apart from the supply of a broad range of quality branded engineering products, enhanced by technical skills, BMG's two Botswana branches offer original spares and advanced workshop resources that ensure all repairs meet OEM standards."

BMG's services also include mobile breakdown, repair and maintenance support, that enables production plants to be up and running as quickly as possible following a breakdown. According to BMG specialists, the introduction of a structured



BMG's two Botswana branches offer original spares and advanced workshop resources that ensure all repairs meet OEM standards.

maintenance management programme, is critical to maximising production efficiencies.

By providing engineering solutions and technical services that optimise productivity, BMG ensures that its product and service offering enhances the efficiencies of every plant. 🌟

New Vermeer D130S and D60S HDDs for emerging markets

Vermeer has expanded its line-up of drills for infrastructure development with the new D130S and D60S horizontal directional drills designed exclusively for emerging markets.

The new machines are manufactured at the Vermeer manufacturing facility in Tianjin, China, and built with the same high-quality parts and components that Vermeer is known for around the world. The new naming structure indicates a new generation of the pipeline drills from Vermeer for the emerging markets that comes with several enhanced features that enable high functionality, productivity, and ease of use.

"We understand that operators in Asia, Latin America and other developing nations are looking for a drill that's specifically for their market," says Colm Rafferty, vice president of developing markets of Vermeer. "That's why we designed the D130S and D60S with the power and productivity they have; so that operators in these areas could have drills that meets their needs."

The need for the D130S and D60S came from hearing that operators in developing nations needed a way to facilitate greater connectivity and support the development of both rural and urban areas. With new infrastructure needing to be developed, including telecommunications (fibre optics), water, electricity, gas and oil pipeline installations across varying ground conditions and locations, a new machine



The units will be available in select nations throughout Latin America, Middle East and Africa, Asia Pacific and select countries in Europe.

was necessary to take on challenging, large diameter drilling projects without worrying about space restrictions. Both drills are capable of tackling those infrastructure projects. They are also designed to keep surface disruption to a minimum, which helps in densely populated or residential areas.

"We wanted to create machines that

built upon their predecessors, still delivered the same high manufacturing quality and were specific to operators drilling in developing nations," explains Rafferty. "These drills are compact, powerful, and productive enough to appeal to operators large and small, and I believe can make a big difference in a company's drilling capabilities and efficiencies." 🌟

Daimler Truck launched on stock exchange as an independent company

Friday 10 December's first day of trading on the Frankfurt Stock Exchange marked the start of a new era for Daimler Truck. Following the spin-off from Daimler AG, the first day of listing symbolised Daimler Truck's journey into unrestricted entrepreneurial independence. This was probably the most important milestone in the company's history.

In future, investors will have the opportunity to invest directly in the shares of one of the world's largest commercial vehicle manufacturers. Daimler Truck considers itself well positioned for the new era of independence. In preparation for the spin-off, the company has specified its financial ambitions to increase the performance and profitability of the segments.

Daimler Truck is consistently and continuously focusing on improving profitability in order to lead the industry on the road to CO₂-neutral transport. Based on its proven cash generation and strong balance sheet, Daimler Truck has received solid investment grade credit ratings. Daimler Truck expects its shares to be listed in the Prime Standard of the Frankfurt Stock Exchange in the DAX index, which has been expanded to 40 members, at the next possible date – probably in the first quarter of 2022.

"This is a historic day for Daimler Truck: for 125 years, our truck and bus business was part of the Daimler Group – now we are becoming an independent, listed company. Making this possible organisationally was a



Daimler Truck executives during the first day of trading.

tour de force. My thanks therefore go to our entire team for their unparalleled commitment over the past weeks and months. So in this respect, today is a finish line for us. We have worked hard to get there," says Martin Daum, chairman of the Board of Management of Daimler Truck Holding AG.

"However, 10 December 2021 is above all the exact opposite, namely a starting line. Because now things are really getting started for Daimler Truck. Now we are looking ahead with courage and confidence. Now we are looking forward to use the creative opportunities as an independent company with our great global team - for even more entrepreneurial success in the future. Everyone should benefit from this - our workforce, our customers and, of course, our shareholders,"

As a listed company, Daimler Truck intends to lead the way to zero-emission transportation even more focused and agile in the future. The development of battery and fuel-cell vehicles is to be accelerated – under its own steam and with strategically sensible partnerships. For example, battery and fuel cell vehicles are to account for up to 60% of Daimler Truck sales by 2030. From 2039, the company wants to offer only vehicles in the Triad that are CO₂-neutral in driving operation. For Daimler Truck, both technologies are compatible and necessary. Purely battery-powered trucks are used in light and heavy distribution transport, for example when it comes to delivering goods in cities. The hydrogen-based fuel cell drive will be indispensable in the CO₂-neutral long-distance truck transport of the future. 🌱

Prestigious award for Ctrack in the Middle East

Ctrack Middle East has been awarded the Best Vehicle Tracking & Fleet Management Company at this year's MEA Business Awards in Abu Dhabi.

The MEA Business Awards were established by MEA markets to reward companies across the Middle East and Africa region who demonstrate true determination and dedication in their industry.

With many industries prospering within the region, the Middle East stands at the forefront of modern business and remains one of the most powerful and influential corporate landscapes in the world.

All participants in the MEA Business Awards are judged purely on merit. The organisers gather information independently from a variety of publicly accessible sources, which are assessed alongside any material supplied by the nominees themselves. Contenders need to demonstrate expertise within their field, dedication to customer service and a commitment to excellence.

This approach has brought the organiser

much success and commendation and enforces their stance that victors are not only determined by the popularity of votes but also by their contributions to the industry.

Ctrack Middle East strives to offer unbeatable customer service and quality. As a global leader in vehicle tracking, fleet management and insurance telematics solutions, it is in the business of ensuring vehicles, fleets and their occupants are Always Visible.

"We are extremely proud of our distribution partners in the Middle East region who has been awarded for combining Ctrack's comprehensive product offering with exceptional customer service as they continue to expand our offering to countries in this vital region," says Hein Jordt, CEO of Ctrack SA.

Owning and operating vehicles efficiently, no matter the industry or environment relies on information. Having the correct information in a tangible format is imperative to making the right decisions and, in turn, to ensure your business runs more productive

and cost-effective.

"During Ctrack's 30-year history, we have developed cutting edge tracking and fleet management hardware and software solutions. We can also tailor-make analytics to aid with short and long-term decision making," comments Hein Jordt, CEO of Ctrack SA.

A comprehensive fleet management solution ensures that elements including safety and security risks, such as dangerous driving, safety, driver fatigue, theft, hijackings and area management, can be mitigated.

Improved productivity is guaranteed when business owners know how their vehicles are used. Efficient fleet management will ensure the avoidance of unnecessary costs incurred by factors such as speeding, accidents, fuel consumption and harsh driving.

"This award is another feather in the cap for Ctrack, and we are looking forward to more expansion into the Middle-East, assisting businesses and their assets to be Always Visible," concludes Jordt. 🌱

FAW Trucks celebrates a year of highs



In the first quarter of 2021, FAW took the top spot in the Heavy Commercial Vehicle segment of the local market for the first time.

FAW Trucks has become one of the true success stories of the South African commercial vehicle market. Continuously reaching new sales heights since its first locally produced unit rolled off the assembly line in 2014, it now has a 16-strong range of commercial vehicles in different body derivatives that cater to virtually every need and application.

The company is committed to bringing to market products of high quality that are well suited to local conditions, boast high levels of safety, convenience and comfort, and represent excellent value for money through competitive pricing and affordable running costs. At the same time, it promises buyers added peace of mind through reliable and efficient aftersales service, maintenance and backup.

The numerous achievements and accolades the company has celebrated in 2021 is unequivocal proof of FAW Trucks' commitment to the South African market.

In the first quarter of 2021 the brand took the top spot in the Heavy Commercial

Vehicle (HCV) segment of the local market for the first time in a highly competitive environment.

In April a significant milestone was reached when the 7 000th locally assembled vehicle rolled out of the Coega manufacturing plant. The unit in question was a JH6 28.500FT, FAW Trucks' flagship model in South Africa.

Yongjun Li, CEO of FAW Trucks SA, says: "This was an understandably proud moment for us and reaffirmed FAW Trucks' commitment to the local market. It was also just reward for what is one of the largest investments made by a Chinese entity in this country."

Funded by the China FAW Group Corporation and the China-Africa Development Fund, the first vehicle rolled off the Coega assembly line in July 2014. The facility was built at a cost of R600 million and spans some 30 000m². This includes a state-of-the-art training facility, a body shop and a paint shop.

Currently the Coega facility has a production capacity of 3 000 units per annum, but this is scalable to 5 000 in order to be able to meet growing demand for FAW Trucks models.

FAW Trucks' most recent achievement was receiving a Silver Award in the 2021 NADA Dealer Satisfaction Index (DSI) survey.

The NADA DSI survey, which marked its silver anniversary in 2021, is carried out annually to monitor the health of the relationship between dealers and their respective manufacturers. It provides the dealer body with a platform to provide manufacturers and importers with feedback and is seen by dealer councils and manufacturers as an effective management tool to address areas of concern and improve service delivery throughout the entire value chain.

FAW Trucks' silver award in the latest survey follows on the bronze award it received in 2019. In 2018 it scooped up the award for the Most Improved commercial vehicle brand. 🌟

Imperial examines AfCFTA

Imperial has launched an insightful feature that delves into the African Continental Free Trade Area Agreement (AfCFTA) and its goal of seamless trade, travel and transport and a single African passport for all African Union member nations.

The objective is to phase out tariffs on 90% of goods within 10 years and create a continent-wide single market for goods and services with free movement of business, people and investments. Another important

goal of the AfCFTA is to create jobs, particularly for women.

The COVID-19 pandemic and vaccine roll-outs have highlighted the importance of the logistics industry in Africa, as well as the opportunities this industry presents in terms of connectivity, distribution and supply chain efficiencies in key industries. The growing consumer base and increased access to the consumer in Africa are particularly appealing to both multinational and local organisations.

However, logistics presents a major challenge, including the cost of moving products into and out of Africa being exorbitant in comparison to other continents, and getting those products to consumers in Africa remains complex. As one of the largest logistics players on the continent, and with logistics being integral to facilitating trade, Imperial believes that the AfCFTA will play an important role from a logistics and transport perspective as countries start embedding trade links. 🌟

SA STILL A LAND OF OPPORTUNITY

As a long-standing believer in the potential of South Africa, I find myself asking what is next for the country at this point. As always, there are concerning factors and cause for hope – and as so often happens, these two seem balanced on a knife-edge. By Howard Betts, chairman: Betts & Townsend.

South Africa's economy, which took off in the early 2000s after the transition to full democracy in the mid-1990s, has slowed considerably in recent years. Our best post-democracy year was 2006, when our real GDP growth was at 5,6%. Since then, it has steadily declined. It has seldom been negative, but it has been slow to negligible. Before COVID-19 threw out the balance of countries across the globe, our real GDP growth in 2019 was 0.2%.

This year it has recovered to around 3,1% but that comes off an extremely low base, and is only sufficient to put us 30th in Africa in terms of GDP growth. Libya, Kenya, Botswana, Niger and Mauritius (the top five) are all projected to have grown at over 6% in 2021. We are also no longer the leading economy in Africa in terms of GDP size. That place now belongs to Nigeria, with South Africa ranking third behind Egypt.

The Rand has lost ground against most major currencies over the course of the past two decades, and our sovereign credit rating was downgraded to junk status by international ratings agencies just over two years ago.

Not all a dead loss

Yet, it is not all a dead loss. South Africa still has rich natural resources – and even if we didn't take full advantage of the surges in commodity prices over the past few years, these resources still provide a good underpinning for our economy at present. We also have well-developed financial, legal, communications, and transport sectors; and a stock exchange that is Africa's largest and which ranks among the top 20 in the world.

Our infrastructure issues are, without doubt, one of the biggest constraints on our growth and competitiveness as a country at the moment. Gross fixed capital formation and the maintenance of infrastructure assets are critical to a country's economic prosperity. I hardly need to state what we are currently seeing in terms of our failing electricity and water infrastructure. Our road network is over-used and under-maintained, and the extensive rail network which was built across the country even before some of the major national roads were developed, is sadly under-utilised.

It is unfortunate to see the deterioration of power and water infrastructure considering how well it once worked, but in that respect we could still consider ourselves better off than many of our African neighbours. Nairobi, for example, has no municipal water supply at all, and water must be trucked in. I have personally witnessed raw sewage running down the streets in Beira. A good many of the major cities across Africa are in a similar situation. I would like to hope that this is not where SA is heading.

The past few years have been strange times in SA politics, which probably hasn't helped. We have seen riots, unrest and protests. Politically, we have become introspective and fractured – and we've taken our eye off the international ball and collective good. The recent elections were interesting, with more people seeming to take part in protests on voting day than actually voting, and with municipal councils being hung from one side of the country to the other and no clear winners.

There is hope

Despite all of this, I believe there is hope. The important thing about living and working in Africa is that one has to look for the silver linings and the opportunities. For some, the state of things in South Africa is enough justification to pack up and emigrate. Personally, I'd far rather be exactly where I am. I like the great weather, the diverse natural beauty, the friendly people and the incredible lifestyle that we still get to live in this country.

More importantly, what keeps me here is that this is still a land of opportunity – a place where one can make a difference. Certainly, one has to be prepared to take on a degree of risk, to work with what is



Howard Betts, chairman: Betts & Townsend.

sometimes unknown. It isn't always easy, but the scale of the opportunities that can still be found or created here is incredible. There is a quote that is famously attributed to Thomas Edison which says: "Opportunity is missed by most people because it is dressed in overalls and looks like work." There is also a 'meme' doing the rounds that goes: "Too many people think the grass is greener somewhere else, but the grass is green where you water it!"

One thing which I believe has enabled us to weather economic ups and downs through 25 years of business is our can-do attitude and our willingness to look hard work in the eye and 'water the grass' where we are. We are coming out of yet another tough stretch and as we enter what looks like a period of growth for SA, we have some exciting projects lined up for the coming year.

There is meaning in doing work that changes the lives of people through the creation of infrastructure and amenities, through job creation, through mentorship and growing small businesses. This is what we get to be involved with every day in our business, and the sense of purpose in it gets us out of bed in the mornings. We might not be able to fix corruption, politics and some of the other issues currently plaguing us, but there is no reason that we cannot play a meaningful part in trying to move things forward. 🌟



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


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