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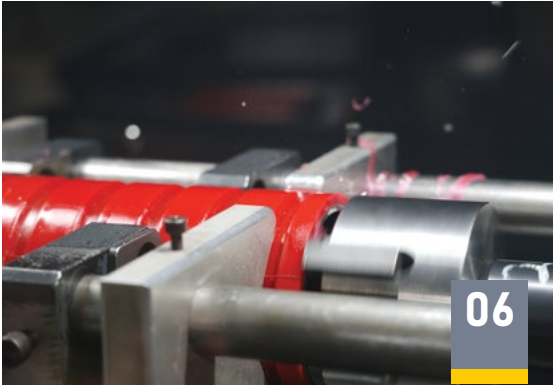
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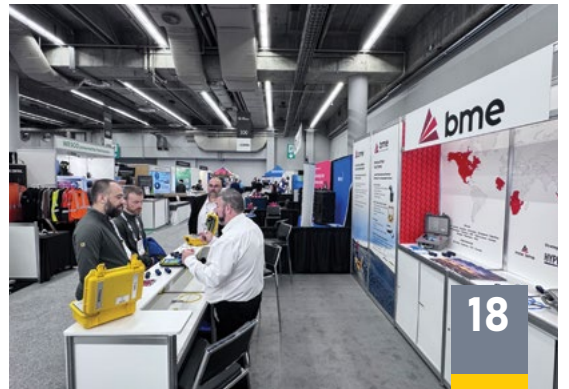
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ON THE COVER

Brelko's Michelle Padayachee has upgraded the company's software and security systems and is driving the agenda to streamline Brelko's manufacturing processes. **Pg 6.**

Pace setter

China's technological advances set the country miles ahead of its peers. Headlines of humanoid robots playing sport, participating in marathons and tackling everyday tasks highlight some of the country's technological prowess. The Asian powerhouse is also making bold strides in the transport and logistics sector, currently running more than 4 000 bullet trains, which can reach speeds of up to 350 km/h, making getting to work a breeze. The country is pushing boundaries with its type tests for the fastest train in the world - the CR450, with a top speed of 400 kilometres per hour.

Attending the 3rd premium customer summit SANY Africa BU 2025, held in China, *Modern Mining* viewed first hand some of these technological marvels at play in the manufacturing space. SANY's manufacturing facilities are a sight to behold - dominated by automation and robotics, few labour in these high-tech environments. In fact, SANY Heavy Industry - the world's third largest construction equipment manufacturer, and the largest in China, plans on upskilling its existing workforce to become engineers, innovators and solutions providers. At its factories, mundane tasks like relocating manufactured items are undertaken by robotics

with scores of robotic welding arms operating 24/7. These powerhouse facilities are churning out some of the most advanced products, including the latest EV trucks equipped with game-changing battery swapping technology. Unlike traditional electric trucks that rely on plug-in charging, which takes between one and three hours to recharge, this latest innovation takes under five minutes to swap. And yes, it does swap the battery in this time – delegates attending the event can attest to it. The good news is that the technology will soon launch in the local market (catch the next edition of *Modern Mining* for the SANY story).

Meanwhile, on the local front, the contentious Mineral Resources Development Bill has industry up in arms, as government has ignored industry input. The latest iteration of the bill is set to further stymie growth with its unfriendly investor stance. For decades,

industry has been fighting for a regulatory environment that will attract and support investment in exploration, mine development and the sustainability of existing mines to unlock the potential of mineral resources for economic growth and job creation – this continues to be an uphill battle. In the meantime, neighbouring countries with appealing mining policies are rewarded with investor interest and project funding. Dr Ross Harvey, our regular columnist, says that if the proposed amendments go through as in their current form, 'the industry's death will be accelerated' (pg 36).

In this edition

Our cover story, Brelko, is 'streamlined for success' with its new recruit, IT and Projects Director, Michelle Padayachee, strengthening the company's cybersecurity defences to guard against emerging threats.

Since joining the business in March last year, the former business analyst has been upgrading the company's software and security systems and driving the agenda to streamline Brelko's manufacturing processes (pg 6). The Council for Scientific and Industrial Research estimates financial losses of up to R2.2 billion per annum to the South African economy because of cyber-crime.

Our commodities outlook focuses on the topic: *The race for high-grade iron ore to satisfy green steel demand* and notes that high-grade iron ore miners hope to enact change, and cash in, by supplying a feedstock for green steel (pg 8). On the topic of clean solutions, manganese miner, Giyani Metals, is targeting commercial production of battery-grade manganese in the next two-to-three years (pg 10) while Botlala Energy's Serowe CBM project, is looking to achieve commercial production of gas by late 2027 and supply the precious commodity to South Africa, which is facing an impending gas cliff (pg 24). Following quicklime supplier, Firering's initial production from its Limeco Project in Zambia, the company is targeting production ramp-up to 80 t/d of quicklime and gradual start-up of all eight kilns (pg 10). ■



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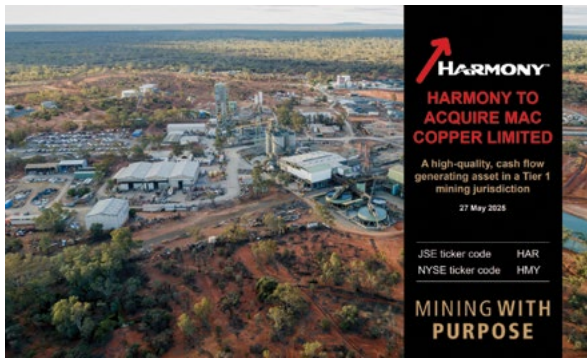
Paul Dunne appointed President of Minerals Council South Africa

The Members of the Minerals Council South Africa recently appointed Paul Dunne as the organisation's President and reappointed its three Vice-Presidents for their second year in office. The Members thanked Dunne for acting as Caretaker President during 2024 and voted for him to continue as President for 2025.

The council also announced that Themba Mkhwanazi, Richard Stewart and Mpumi Zikalala will continue as Vice Presidents, ensuring leadership continuity during a time of regulatory flux for the mining industry and efforts to stabilise the operating environment in South Africa.



Paul Dunne is appointed President of Minerals Council South Africa.



Harmony acquires Mac Copper

Gold miner, Harmony, has entered into a binding agreement to acquire, through its wholly owned Australian subsidiary Harmony Gold (Australia), 100% of the securities in MAC Copper (MAC), a Jersey-registered company, at a price of US\$12.25 per MAC share in cash. The transaction implies a total equity value for MAC of US\$1.03 billion¹ (approximately R18.4 billion). MAC is listed on the New York Stock Exchange (NYSE) under the symbol MTAL and the Australian Securities Exchange (ASX).

MAC has a 100% interest in the CSA Copper Mine (CSA), its sole asset, which is located ~700km west-northwest of Sydney in the Cobar Region of New South Wales, Australia.

"The acquisition of the CSA Copper Mine in Australia is significant as it introduces a high-quality, established underground producing copper asset to the Harmony portfolio. CSA is one of the highest-grade copper mines in Australia, producing ~41kt of copper in calendar year 2024. The operation is a logical fit with the portfolio given it meets Harmony's core investment criteria, including increasing free cash flow generation while improving margins at long-term expected commodity prices. We believe that Harmony is well positioned to leverage its expertise in underground mining to further enhance operations. Furthermore, the transaction represents a significant step forward in transforming Harmony into an increasingly de-risked, higher-quality, global gold and copper producer through disciplined and effective capital allocation," said Beyers Nel, Chief Executive Officer. ■

Aurum secures strategic JV to expand Boundiali Gold Project



Aurum inks JV to expand Boundiali Gold Project.

ASX-listed Aurum Resources has announced, through its wholly-owned subsidiary Plusor Global, signing of an agreement to earn up to an 80% interest in each of two contiguous permit applications (Encore JV permits) and grow the landholding at its 1.6 moz Boundiali Gold Project in Côte d'Ivoire. Aurum Managing Director Dr Caigen Wang commented: "This Encore JV is a highly strategic acquisition, significantly enhancing our position in the Boundiali gold belt with an additional 316km² of ground that is adjacent to existing tenements where we have already defined Mineral Resources. Therefore, these two permit applications are ideally located to complement and potentially expand our existing 1.6 moz Boundiali Gold Project. The terms, applied per permit, allow for a focused and staged investment, aligning our expenditure with exploration success. The equity incentives ensure strong alignment with Encore Resources. We are excited by the potential to unlock substantial value across these new licence areas for our shareholders." ■

The Mineral Resources Development Bill does not reflect inputs from industry body



Minerals Council South Africa CEO, Mzila Mthenjane.

The draft Mineral Resources Development Bill does not reflect the inputs of the Minerals Council South Africa during brief, high-level engagements with the Department of Mineral and Petroleum Resources, says CEO Mzila Mthenjane.

“The draft bill is not altogether optimal. We did have

engagements with the department, but we cannot see where our inputs were taken into consideration,” says Mthenjane.

“What we were exposed to in our two engagements was very high level and we were not given any access to the underlying wording of what we were shown and how it was being amended,” he says.

Giving an example, Mthenjane points to oft-repeated public comments by Minister Gwede Mantashe that prospecting companies were excluded from the same empowerment requirements for holders of mining rights.

“We raised this point over and over in our engagements with the department that the amendments must specifically exclude prospecting companies from empowerment requirements. Exploration is the highest risk part of the mineral value chain and imposes an unnecessary burden on prospectors who must sink every rand into drilling and data interpretation. Yet in this draft bill, none of that is included,” he says.

The Minerals Council continues to review the Bill and will further engage the department to co-create a regulatory environment that will attract and support investment in exploration, mine development and the sustainability of existing mines to unlock the potential of South Africa’s mineral resources for economic growth and job creation. ■

Ivanhoe Mines doubles size of Makoko-Kitoko Copper Discoveries

TSX-listed Ivanhoe Mines has announced an updated Mineral Resource estimate for the Makoko District within Ivanhoe’s 54%-to-100% owned Western Forelands Exploration Project. The Western Forelands Exploration Project consists of a licence package covering 2 393 km² adjacent to the Kamoa-Kakula Copper Complex in the Democratic Republic of Congo. The area of the Western Forelands licence package is some six times larger than that of the Kamoa-Kakula Copper Complex. Since the maiden Mineral Resource on Makoko and Kiala was announced on November 13, 2023, more than 86 000 metres of diamond drilling were completed in the Western Forelands up to February 2025. Since November 2023, the Makoko District has increased by 2 kilometres to 13 kilometres in strike length, and the total contained copper has approximately doubled. ■



Ivanhoe Mines drilling doubles size of Makoko-Kitoko Copper Discoveries.

Platinum market deficit deepens

The World Platinum Investment Council - WPIC® - recently published its Platinum Quarterly for the first quarter of 2025 with a revised full year 2025 forecast. Global demand in Q1’25 recorded a 10% year-on-year increase to 2 274 koz. This was due to strong investment demand, driven principally by a sharp rise in exchange held platinum stocks as tariff-related uncertainty and a widening location premium encouraged higher metal inflows into the US. Investment demand growth offset declines in automotive and industrial demand. Meanwhile, total platinum supply fell 10% to 1 458 koz, reflecting the seasonally weak mine production quarter that could not be offset by a modest year-on-year recovery in recycling. This resulted in a Q1’25 deficit of 816 koz, the largest single quarterly deficit in six years. Supply decline remains a prominent theme for full year 2025 with a 4% year-on-year drop in total supply to 6 999 koz forecast, the lowest level in five years. Demand is set to fall by 4% to 7 965 koz in 2025 as growth in jewellery and investment does not fully offset a decline in automotive and industrial demand. Nevertheless, this is 115 koz higher than our previous demand forecast, deepening the third successive annual deficit forecast for 2025 to 966 koz. Trevor Raymond, CEO of the WPIC, comments: “The platinum market is in structural deficit, irrespective of the uncertainties posed by today’s geopolitics. We are seeing that platinum’s diversity of demand provides a significant degree of resilience even as the US government’s new approach to tariff policy starts to take effect. At the same time, it is widely recognised that platinum mine supply continues to face downside risks.” ■



The platinum market is in structural deficit.



Polyurethane roll in double facing machine.

Brelko streamlined for success

By Nelendhre Moodley

The rise in cyberattacks and data breaches in recent years has impacted several businesses across various sectors. Some of the victims of cyberattacks include the government agencies South African Airways, Transnet and Cell C. This is a clear reason for businesses to strengthen their cybersecurity defences and guard against emerging threats, says Brelko MD, Kenny Padayachee, who recently appointed an IT and Projects Director.

Former business analyst, Michelle Padayachee, has upped the ante for the Johannesburg-based business, upgrading the company's software and security systems and driving the agenda to streamline Brelko's manufacturing processes and equipping the workforce with relevant IT skills.

"Michelle brings to the business skills sets that Brelko has thus far been lacking. Aside from her vested interest, the business benefits from her experience of working in the corporate world at firms with an international footprint. Since joining, Michelle has identified systems challenges and offered solutions for Brelko's manufacturing process," Kenny tells *Modern Mining*.

Armed with two degrees – a BSc (Physiology) and a BCom *Cum Laude* specialising in Insurance and Risk Management and Human Resources - Michelle has established seamless cybersecurity integration across all departments.

"As organisations rely heavily on technology for their daily operations, managing and preventing cybersecurity threats is a critical challenge for businesses. As it is, there is a dramatic increase in cyber incidents globally. Investing in security systems is essential for preventing financial, legal, and reputational damage."

The Council for Scientific and Industrial Research estimates financial losses of up to R2.2 billion per annum to the South African economy because of cyber-crime.

"Being in the field of insurance and risk management for more than a decade and thereafter as a business analyst for international insurance software companies, has given me the edge in handling issues around software security. As a one-stop shop for conveyor belt cleaning equipment, Brelko has several manufacturing processes at play. Always aiming for better, we have identified gaps in the business, fine-tuned process flows in each department and implemented best practice. More recently, we completed a review of over 300 ISO documents, revised our policies and procedures in line with latest developments and aligned our software licence renewals to take place on a pre-determined date. Importantly, we can now erase all data and settings remotely from a device if it is lost or stolen - this ensures data integrity and security," explains Michelle.

Investment in IT and software security has increased efficiency and cost effectiveness, adds Kenny.

Upskilling employees

In tandem with boosting its security systems, Brelko is investing in IT related training for its workforce and has implemented several initiatives, including an email and password policy and disaster recovery plan.

"Brelko has deployed modern communication processes to ensure that staff at the various departments are informed of the latest developments in real time. Microsoft Teams is now the



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platform of choice for information sharing,” says Kenny.

Given that multi-skilled employees, equipped with a diverse range of competencies, play a key role in driving innovation and enhancing productivity, the IT department has been documenting “every job spec in the company”.

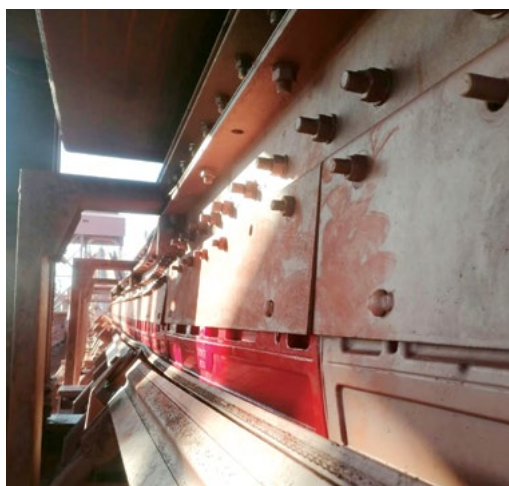
“We have developed checklists that detail step-by-step how each task is undertaken. This helps in upskilling employees to tackle a variety of tasks, which is relevant when there is a lull in a specific section of the manufacturing process. In this way we empower our employees to learn new skills and eliminate the danger of being entirely reliant on a single individual for a particular task,” says Michelle.

“Having someone in the business who understands software and software development is advantageous for Brelko. In fact, it has been a steep learning curve for everyone in the company. On a more positive note, our Brelko team has embraced the new developments exceptionally well and we are now equipped with some of the latest security and software systems available and strive to stave off any potential cyber-attacks,” explains Kenny.

Tough operating environment

Discussing the business milieu, Kenny says that the operating environment, characterised by economic headwinds and declining commodity prices, continues to negatively impact mining companies and their profitability, with suppliers to the mining industry subsequently feeling the pressure.

“At the moment, the platinum industry is in oversupply and the price of gold is highly favourable given geopolitical instability in key regions; however, as local gold mines are



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extremely deep, their profitability remains marginal. As a supplier to the mining industry, Brelko is fortunate that its product range is suited to a variety of commodities. We have an extensive geographical footprint, supplying products to mines across all nine provinces in South Africa, the SADC region and in key mining jurisdictions across the globe,” says Kenny.

The tough operating environment has been further exacerbated by US President Donald Trump’s steep tariff legislation, which affects local manufacturers importing key raw materials. Brelko imports raw materials such as tungsten, polyurethane and glass-filled nylon (Tecomid) from China, Europe and the USA.

“Like our peers we face headwinds; however, Brelko remains a highly sustainable business. We make responsible decisions and reinvest in growing the company so that the business remains solid even during difficult times,” concludes Kenny. ■

Cybersecurity

Cybersecurity in business refers to the practices, technologies, and policies implemented to protect computer systems, networks, and data from cyberattacks. It’s crucial for businesses of all sizes as it safeguards sensitive information, maintains customer trust, and prevents financial losses, reputational damage, and operational disruptions.



Drilling at the Kallak Project.

The race for high-grade iron ore to satisfy green steel demand

Iron ore is by far the world's most abundantly consumed metal, with consumption reaching an estimated 3.495 billion metric tonnes in 2024, according to an IndexBox report. But with three-quarters of steelmaking involving burning polluting hydrocarbons, high-grade iron ore miners are hoping to enact change, and cash in, by supplying a feedstock for the decarbonised alternative – green steel.

The world uses 20 times more iron, in the form of steel, than all other metals combined, according to BHP. Steel is vital to facilitating modern life, with heavy use in construction, transport, healthcare and traditional and renewable energy infrastructure. To enable these sector applications, daily steel production is astronomically high; 548 Eiffel Towers could be built with just a day's worth of global steel production.

As the world has developed, modernised and globalised, so too has steel production. Since 2000, global production has expanded by one billion tonnes, reflecting the growth of Asian markets, and numerous advancements have been made to improve its efficiency; the steel of today is not only stronger than the steel of the past, but it is also a third lighter.

In 2021, 2.8 billion tonnes (Bt) of metals were mined globally; 2.6Bt were iron ore (Visual Capitalist)

The latest advancement in steel centres on its capacity to improve its environmental credentials. In 2022, 75% of steelmaking involved using coal to reduce iron ore in blast furnaces, accounting for 7% of all global greenhouse gases.

The International Energy Agency estimates that emissions from the iron and steel sector must fall more than 50% by 2050, relative to 2019, in order to meet global energy and climate goals. The answer, many feel, is green steel, which the World Economic Forum defines as steel manufactured “without the

use of fossil fuels”. Direct Reducing Iron (DRI) steelmaking, which uses hydrogen in place of coal, is becoming a popular ‘green’ production method, and emits a quarter of the CO₂ emissions of blast furnace steelmaking, according to Singapore Exchange. Electric Arc Furnaces, powered by electricity, are another green alternative to blast furnaces.

According to IEEFA, only high-grade iron ore, with an iron content over 67%, is suitable as feedstock for green steel as it ensures efficient reduction and reduces impurities that may disrupt the process. As the world looks to transition away from a reliance on fossil fuels to meet emission reduction targets, there is a growing demand for iron ore that is amenable to production via DRI processes. In turn, the emphasis is placed on miners to deliver these resources, requiring increased global efforts to bring mines that can yield a high-grade iron ore product into production.

Zanaga Iron Ore Company (ZIOC), led by CEO Marty Knauth, is the developer of the Zanaga Project in the Republic of Congo. The company believes that with the right support and investment, it can successfully achieve high-grade iron ore production.

The Zanaga Project holds Africa's largest known iron ore reserve of 2.1 billion tonnes from a mineral resource of 6.9 billion tonnes. The company is targeting production of 30 million tonnes per annum of high-grade pellet feed concentrates, grading up to 68.5% iron, over an initial 30 year mine life. The products, the



The Zanaga Iron Ore Project in the Republic of Congo is in the development stage.

company says, could be suitable for DRI steelmaking, and is therefore primed to support this growing market sector driving decarbonisation of the steel industry.

In March, a group of high-profile mining executives invested \$23 million to buy out Glencore’s stake in ZIOC and partially finance construction of the project. The consortium includes ex-Anglo American CEOs Mark Cutifani and Tony Trahar, and ex-Technical Director Tony O’Neill, as well as former Head of Business Development at Rio Tinto, Phil Mitchell. Sir Mick Davis, an industry heavyweight and former CEO of Xstrata, also contributed to the fundraise, alongside Gagan Gupta, CEO of Arise, a company involved in port and infrastructure development in the Republic of Congo.

ZIOC Chairman, Clifford Elphick, described the company’s project as the “world’s most compelling undeveloped iron ore asset globally”. The investment somewhat mirrors this sentiment, with some of the sector’s biggest names demonstrating their faith in the project and, in turn, high-grade iron ore as an in-demand, if not critical, resource.

This support is already moving the project towards construction, with plans for the company to conduct DRI test work during the remainder of this year in parallel with completing feasibility studies to evaluate pellet plant construction, a single buried 30Mtpa capacity pipeline, and the opportunity to make substantial capital and operating cost reductions through dry tailings. The combined impact from these workstreams is targeted to increase the Net Present Value of the project by more than \$4 billion.

Zanaga offers an indication that the growing appetite for green steel can be met if adequate backing is provided.

Beowulf Mining is, too, sitting on a substantial resource capable of producing a high-grade concentrate, and has been clear about its ambition to support the European green steel supply chain, particularly in Sweden, home to its Kallak iron ore project.

Beowulf is targeting production of high-grade magnetite concentrate in excess of 70% iron at Kallak, operating through its Swedish subsidiary Jokkmokk Iron Mines AB. Kallak’s measured

and indicated resource stands at 132 million tonnes, with metallurgical test work demonstrating the company’s ability to produce a market leading concentrate suitable for use in green steel, helping towards the goal of decarbonising the steel industry.

Currently, only a very small percentage of global iron ore production comes from EU countries – just 1.3% according to the latest USGS figures – with supply chains dominated by Australia, Brazil, China and India. This places weight on the need for reliable and sustainable European production and the associated stability that comes with this. In Europe, substantial legislation and the introduction of emissions taxes such as the EU’s Carbon Border Adjustment Mechanism (CBAM) offer incentives for rapid carbon reductions, motivating businesses to seize the vast benefits of ‘going green’ that extend beyond the ethical upside of prioritising environmental stewardship.

Whilst operating in Europe poses high regulatory hurdles, it comes with the benefit of rule of law, as well as access to excellent infrastructure, renewable power and a skilled workforce. Kallak also finds itself in a strong iron ore and steelmaking cluster; Sweden is already established as one of Europe’s leading mining nations. The largest underground iron ore mine in the world, LKAB’s Kiruna mine, is a mere 135 kilometres north of Kallak, and the Aitik copper mine, Europe’s largest open pit, is located 65 kilometres north of Kallak.

Beowulf is currently at the stage of preparing a Pre-Feasibility Study and Environmental Permit application for Kallak. The company argues that the project is not only crucial to European supply chains and the green energy transition, but also to the local area, as it is projected to create approximately 250 direct jobs, whilst concurrently improving regional infrastructure. Should the regulatory hurdles be navigated, the company will be excellently placed to play a major role in driving forward the European green steel industry.

ZIOC and Beowulf are operating on different continents but share the same goal – producing the high-grade iron ore that can transform steelmaking. The sheer volume of global steel consumption means that the rewards for the mining companies that facilitate this are, potentially, enormous. ■

The Giyani team with the Demo Plant (Process Engineer Keitumetse Keiphethetswe, Lead Process Engineer Desiree Meyer, CEO Charles FitzRoy, VP Corporate Development Sean Thijssse, and DFS Lead Andries Cilliers).



Giyani targets commercial production of battery-grade manganese

By Nelendhre Moodley

On the back of global demand for battery electric vehicles forecast to grow six-fold from 2021 to 2030, demand for raw materials used in batteries is predicted to outpace supply by 2030, reveals a study by McKinsey & Company, *Toward security in sustainable battery raw material supply*. This is good news for Canada-based mineral resource company, Giyani Metals, which is targeting commercial production of battery-grade manganese in the next two-to-three years from its K.Hill project in Botswana, CEO Charles FitzRoy, tells *Modern Mining*.



CEO Charles FitzRoy.

The emerging producer has developed a proprietary hydrometallurgical process to produce battery-grade manganese - high purity manganese oxide (HPMO) and high purity manganese sulphate monohydrate (HPMSM)-lithium-ion battery cathode materials critical for EVs and energy storage systems (ESS).

“The commercial advantages of producing multiple battery-grade manganese products cannot be overstated. The dual capability of being able to produce both HPMO and HPMSM allows Giyani to position itself as a preferred supplier in this fast-growing industry. Looking ahead, lithium manganese iron phosphate (LMFP) battery demand is likely to take a large market share from lithium iron phosphate (LFP) batteries. This will

lift demand for battery-grade manganese in both HPMSM and HPMO.”

FitzRoy adds that the development of battery-grade manganese assets in regions such as South Africa, Botswana, Morocco, the US and Canada opens the global market to new players.

“The government of Botswana is keen to diversify away from diamonds and has been extremely supportive in advancing a varied set of commodities, including our flagship manganese project. The K.Hill deposit is a high-quality asset offering robust economics, a large mineral resource, and strategic location, positioning it as a potential leading supplier of battery-grade manganese products for the growing EV battery market.”

Although China is currently the dominant player in the HPMO and HPMSM market, accounting for over 90% of market share, the western world is fast making a play for this segment of business. Giyani Metals, an early mover in this space, is targeting original equipment manufacturers (OEMs) in Europe and North America, and key automotive suppliers in Korea and Japan.

Although demand for battery-grade manganese remains relatively minor at the moment, manganese is increasingly being used in lithium manganese iron phosphate (LMFP) and lithium manganese nickel oxide (LMNO) batteries to enhance energy density, improve safety, and reduce costs, making them attractive for EVs and ESSs.

“OEMs are amplifying the quantity of manganese content in LMFP and LMNO batteries and in the next three years when Giyani Metals is ramping up commercial production, battery grade manganese is projected to be in deficit.”

Demo plant

In March, Giyani announced the first production of battery-grade manganese, HPMO, from its demo plant in Johannesburg.

Giyani Metals demo plant - the largest facility of its kind in the Western market, at 100 metres in length and 15 metres in height, was developed primarily to provide the company with a platform to understand how its planned commercial facility would behave.

The plant was designed at a scale factor of roughly 1:10 to the planned commercial plant, with the leach tanks at 60 cm diameter in the demo plant, expected to be 8-10 times larger in the commercial plant.

“Our demo plant is a phenomenal facility and a key asset. Once it has successfully proved HPMO and HPMSM from K.Hill and satisfied the requisite specs from our off-take partners, it will be used to test ore from our other assets.”

According to FitzRoy, metallurgical test-work is currently underway to further optimise the flowsheet. The company is

focused on further reducing reagent use and improving both the operating cost and carbon profiles for the commercial plant, planned for construction adjacent to Giyani’s extensive 100% owned manganese oxide ore sources in southern Botswana.

In parallel with these developments, a definitive feasibility study (DFS) is scheduled for completion later this year.

Giyani Metals received a Special Economic Zone (SEZ) licence for its commercial plant earlier this year. The SEZ licence will allow Giyani to benefit from 5% corporate tax rate for the first 10 years of production from its commercial plant, increasing to 10% thereafter - a considerable benefit, which was not included in the 2023 PEA.

Advancing development of K.Hill manganese project

Following the production of its first batch of high-purity manganese oxide (HPMO) from its demo plant earlier this year, the Toronto Stock Exchange listed entity is advancing project construction and development for commercial scale manganese production.

The company is currently advancing discussions with potential offtake partners and is aiming to secure project finance in the second half of next year

“Having illustrated the success of our propriety technology; now is an opportune time to engage investors in the development of the K.Hill project. To date, there has been keen interest from investors in North America, the EU, and from the Industrial Development Corporation of South Africa (IDC).” Earlier in 2024, Giyani Metals secured a US\$26 million funding package, with US\$16 million from the IDC.

FitzRoy says that subject to starting construction by 2027, Giyani Metals anticipates production ramp up from 2028 onwards, which “dovetails perfectly with the timelines anticipated for strong demand of battery-grade manganese.”

To date, Giyani Metals has completed a large portion of the geotechnical work, early works on the tailings storage facility, is advancing development of access roads and has initiated a tender process for fencing the mining license area. Furthermore, the company has identified long lead items for fabrication and a suitable location for its solar plant – all of which will ensure that the project progresses at speed.

In February, Giyani launched its first tender for site preparation works, perimeter fencing and beacon installation and continues to target contractors from the local community of the Kanye district, thus ensuring that the local community benefits directly from Giyani’s K.Hill project. ■



Manganese

- HPMO is becoming the favoured forerunner for lithium-manganese-iron-phosphate (LMFP) and lithium-manganese-nickel-oxide (LMNO) batteries, while HPMSM is the chosen precursor for nickel-manganese-cobalt (NMC) batteries, both HPMO and HPMSM can be used for LMFP and LMNO batteries.
- Manganese compounds, including carbonate, oxide, and sulphide, have diverse applications due to their varying properties and reactivity, with manganese carbonate used in pigments and pharmaceuticals, manganese oxide as a catalyst and in ceramics, and manganese sulphide in metalworking and powder metallurgy.

Firering: becoming a leading supplier of quicklime in Zambia

By Nelendhre Moodley

With first production of quicklime from its Limeco Project in Zambia under its belt, AIM-listed Firering Strategic Minerals is targeting production ramp-up to 80 t/d of quicklime and gradual start-up of all eight kilns, Independent Non-Executive Director, Vassilios Carellas, tells *Modern Mining*.



View of the primary crusher, installed at Limeco as part of the 2-stage crushing circuit.

“**R**eaching first quicklime production at Limeco marks a significant milestone in our journey. Our focus now is on steadily ramping up production to full capacity while ensuring the consistent delivery of high-quality quicklime to meet the growing demands of the Central African Copperbelt and agricultural sectors,” says Carellas.

Quicklime (calcium oxide) is in deficit in Zambia and currently being imported. The commodity chemical plays a crucial role in copper mining being primarily used for ore processing, pH regulation, and impurity removal, ensuring optimal copper recovery and purity, as well as contributing to responsible tailings management.

Firering currently holds a 16.7% interest in Limeco Resources, which is set to increase to 20.5% by the end of April. It also holds an option to acquire an additional 24.5% stake for US\$4.65 million, which would bring its total interest to 45%. The remaining shares are held by Kai Group, the majority shareholder, with a minority interest retained by Clearglass Investments.

The company is currently optimising the first of its eight kilns, targeting steady-state production by the end of April 2025. It is pursuing a phased ramp-up strategy, aiming to have four kilns in production by year-end, with the remaining four expected to be operational in the first half of 2026. Once fully commissioned, Limeco will become one of the largest producers of quicklime in Zambia, strengthening its position as a key player in the country’s industrial and mining sectors.

Discussing the history of the project, Carellas explains that

owing to the quicklime deficit in the country, multinational mining company, Glencore constructed the Limeco Project for its Mopani Copper mine. However, shortly after constructing the facility, Glencore exited Zambia.

“Although Glencore constructed the plant over five years ago, it has never been operated. In fact, before Glencore exited the country, it ran a commissioning process of Kiln 1 for six months during which time the copper miner identified a number of issues that needed to be addressed. As it stands, the facility is almost brand new, having never actually been used. Firering has since addressed the issues identified during the Glencore commissioning process and is now going through an optimisation process before becoming fully operational.”

With over \$100 million in historical investment, the project is strategically positioned to support expanding copper production in the African Copper Belt, which is currently reliant on domestic sources of quicklime as well as imports from South Africa.

In addition to supplying high spec product to the mining industry, Firering has options to supply product to the fertilizer, chemical and construction industries.

“Firering’s Limeco project is a Tier One resource with an above 95% calcium carbonate (CaCO₃) that enables a high specification (spec) quicklime product to be produced for the market. High-quality quicklime commands a premium price and is suitable for several industries, including the fertilizer industry,” explains Carellas.



View of the vertical kilns, used for burning the crushed limestone to produce the quicklime product.

Firing aligns to Zambia's increasing copper production

2025 and 2026 are set to be milestone years for the emerging quicklime producer as it aligns its growth strategy to those of the country, which is looking to more than triple its copper production. Zambia's President Hakainde Hichilema has set an ambitious target of lifting copper production from the current 830 000 tpa to 3 million tpa over the next decade.

As a result, several miners in Zambia are bumping up their copper capacity, including Barrick, which is expanding its Lumwana Super Pit project and First Quantum Minerals through its S3 expansion at its Kansanshi copper mine, scheduled for completion in mid-2025. International Resources Holding is advancing a recapitalisation initiative aimed at positioning the Mopani Mine as the most productive copper mine in the Copperbelt.

Further to this, Jubilee Metals, which recently restarted its Roan operations, is looking to accelerate its production of copper, while Vedanta Resources has plans in place to raise around \$1 billion to fund the development of its Konkola Copper Mines (KCM) – this in a bid to boost copper output at KCM to about 300 000 tons per year over the next five years.

“Apart from existing producers ramping-up production, new copper producers are entering the fray and there are indications of a robust uptick in exploration activities in Zambia. With these initiatives at play there is the corresponding strong demand for quicklime, which we are in a position to supply from our 145 mt

resource. Aside from a LOM of 50 years, there is an opportunity to expand the existing resource base,” explains Carellas.

Coupled with Limeco's current resource base, which is only drilled down to 80 metres in depth, the company has an opportunity to increase output through the introduction of more kilns to meet the Zambia's growing needs.

“Described as a Tier One asset, the Limeco deposit is a high purity shallow project, ideally located less than a kilometre away from the plant itself. Apart from the 50-year mine life, there is scope to expand the resource base by mining at depth.”

According to Carellas, the Zambian project provides substantial logistical and price advantages for local copper producers. “Quicklime typically incurs high transport costs when brought in from outside the region. Because our project is situated near the majority of major copper mines, we'll be able to offer a meaningful cost advantage to our local client base.”

Off-take agreements

While the miner is eager to ink off-take agreements, Carellas is quick to point out that the company's immediate focus is to optimise its processes and ensure product consistency and, only once it is satisfied, will it secure off-take agreements. While mines require a quicklime spec of above 80% (CaO), Firing is targeting a quicklime specification of above 90% CaO.

According to Carellas, the company is in the process of certifying its onsite laboratory to provide assurance on product quality.

As it is, a number of potential customers are in the process of testing Firing's quicklime at their respective operations.

Interest for quicklime remains robust, with Carellas explaining that a neighbouring business, located five kilometres away from the Limeco deposit, is eager to acquire quicklime for its agricultural business.

Carellas expects to complete the plant optimisation process in the next few months with an eye to securing off-take agreements by October this year.

Firing expands product offering

The UK-listed entity is also reaping the rewards of half a million tonnes of raw material stockpiles mined by Glencore, “half of which have been crushed and used as feedstock for the first kiln”. “We have more than 40 000 tons of material – sufficient to fire up the kiln for at least the next year,” says Carellas.

Kilns require limestone feed of between 60 and 90 millimetres in size and “anything smaller is crushed further and sold as aggregate to the construction sector”, which means that as the miner primes to sell its quicklime later this year, it has already begun generating positive operational cash flow from aggregate sales.

Firing will unlock further revenue from its cement plant, which is currently onsite in containers.

Prior to exiting the country, Glencore laid the foundations for a cement plant close to its existing quicklime processing facility. Firing expects to bring the cement plant into production before the end of 2026.

“Instead of selling aggregates at the gate for \$6/ t, we plan to produce cement which we can sell for \$140 a ton - theoretically adding another \$20 million to our bottom line,” concludes Carellas. ■

Achilles in Africa: enabling ethical and sustainable mining across the continent

Africa is a key player in the global mining industry, endowed with vast reserves of critical minerals such as cobalt, lithium, copper, and rare earths. In fact, according to the UN Environment Programme, Africa houses approximately 30% of all known global mineral reserves. As the world accelerates towards a cleaner future driven by electrification, battery technologies, and green energy infrastructure, the demand for these critical minerals is soaring, with the International Energy Agency forecasting a sixfold increase by 2050. Mineral-rich jurisdictions like Africa are therefore set to play a pivotal role in this transition.



Anglo American's copper mine supplied with 100% renewable electricity - copper is a metal critical to economic development.

However, this surge in critical mineral demand brings with it increased scrutiny. Environmental, Social, and Governance (ESG) compliance, ethical mineral sourcing, sustainability commitments, and modern slavery laws are now central to global supply chain standards. In fact, a 2024 Mining and Metals Survey by international law firm White & Case revealed that 65% of respondents believe ESG pressures will intensify, even as shareholders demand stronger financial returns. This highlights a difficult challenge: mining companies must scale production while simultaneously adhering to evolving ESG standards.

Amidst this complexity, Achilles emerges as a key player, offering companies such as AngloGold Ashanti and Anglo American transparency, compliance, and ethical integrity in their supply chains across Africa. With deep expertise in responsible sourcing, data intelligence, and supplier risk management, Achilles is enabling mining companies across 142 countries to navigate these challenges and lead a new era of sustainable mining.

With deep expertise in responsible sourcing, data intelligence, and supplier risk management, Achilles is enabling mining companies across 142 countries to navigate these challenges and lead a new era of sustainable mining.

Africa's mining supply chain: complex challenges

Africa's mining sector presents both opportunities and operational complexity. Companies face regulatory inconsistency across jurisdictions, including concerns over carbon emissions and environmental degradation, and risks of modern slavery and unethical labour practices, particularly in artisanal and small-scale mining. Companies might also face geopolitical instability which disrupts supply chains and investor confidence, or cybersecurity threats as mining operations become increasingly digitised. Achilles' industry insights highlight that a significant percentage of companies lack formal processes to identify these operational and sustainability challenges, underscoring the need for improved risk management. These challenges demand a proactive, regionally-informed, and technologically-advanced approach to supply chain risk and compliance – precisely where Achilles excels.



Africa holds 30% of global mineral reserves, making it key to the world's green energy transition.



Africa's mining sector demands a regionally informed, tech-driven approach to manage complex operational and compliance risks.



New ESG and climate legislation across Africa is raising the bar for compliance – Achilles supports mining companies within the region.

How Achilles is addressing mining challenges in Africa

Achilles assists companies in addressing regional-specific risks and regulatory gaps by providing compliance solutions tailored to the unique contexts of different regions, including Africa.

This includes due diligence and supplier verification, where Achilles empowers mining companies to gain a complete view of their suppliers using AI-powered risk assessments, on-the-ground audits, worker interviews, and third-party verification through NGOs and human rights organisations. This robust framework helps identify and mitigate issues such as unverified sourcing. Similarly, through advanced risk identification tools and supplier assessments, Achilles supports companies in rooting out human rights violations, child labour, and exploitative practices – common risks in certain mining regions. These audits include improvement plans to elevate standards and ensure long-term compliance.

Several African governments are enacting stricter ESG regulations and net-zero targets, such as South Africa, which passed a comprehensive law in 2024 setting emission limits for major polluters and mandating adaptation plans. Similarly, Nigeria's Climate Change Act of 2021 established a framework for achieving net-zero emissions between 2050 and 2070. These legislative efforts reflect a growing commitment across the continent to enhance ESG standards and address climate change, making Achilles' expertise particularly valuable. Achilles' Carbon Reduce Programme helps mining companies measure, manage, and minimise their carbon footprint, particularly Scope 3 emissions tied to suppliers.

The company also specialises in financial and geopolitical risk mitigation, helping companies in regions such as South Africa, Ghana, and the DRC navigate political volatility by delivering supplier risk profiles that include geopolitical and financial health indicators. What's more, with increasing digitisation in the mining sector, Achilles helps to safeguard data integrity by embedding cybersecurity protocols into supplier onboarding and evaluation processes.

Achilles' competitive advantage in African mining

Unlike many compliance firms that react to regulation after the fact, Achilles' bespoke approach encourages mining firms to anticipate and adapt to future ESG laws ahead of the curve. This is critical in Africa, where regulatory frameworks often evolve rapidly. Rather than outsourcing assessments, Achilles uses local, in-house auditors who understand regional nuances, legal landscapes, and cultural dynamics, leading to increasingly accurate and impactful evaluations. What's more, their technological edge allows mining companies to gain unparalleled visibility into their supply chains. Achilles leverages AI, machine learning, and a global intelligence networks to deliver real-time regional insights into supplier performance, compliance risk, and ESG alignment.

The future of ethical and sustainable mining in Africa with Achilles

Achilles is redefining what ethical mining looks like in Africa, ensuring that transparency, responsibility, and sustainability are at the core of every operation. Africa is central to the global energy transition, but companies must balance growth with compliance. Achilles' supply chain solutions help mining firms meet international expectations whilst fulfilling local development obligations. As African governments enforce stricter ESG laws, the road ahead demands more than just mineral output from companies. It requires transparency and responsibility, and Achilles offers the tools, expertise, and insights to build these ethical, future-ready supply chains. ■



Weir's Mill Circuit University ensures that technical staff skill levels are keeping up with technology.

Efficiency is cornerstone of Weir's sustainability drive in Africa

With sustainability at the heart of its global strategy, Weir's focus on energy and water efficiency has a special relevance on the African continent, according to Chris Mortimer, Weir's Director of Safety, Health & Environment in Europe, Middle East and Africa (EMEA).



Chris Mortimer, Weir's Director of Safety, Health & Environment in Europe, Middle East and Africa (EMEA).

“Considering Africa's ongoing challenges with limited energy and water resources, our initiatives deliver tangible benefits not only to the countries where we operate but also directly to the sites where our solutions are implemented,” says Mortimer.

Weir has set ambitious sustainability targets that are being implemented across its global operations, he explains. A key commitment made in 2019 is to cut carbon emissions by 50% by 2030, with progress closely monitored at site, region and global levels. This forms part of the company's broader drive to support sustainable mining by reducing energy consumption, using water more efficiently and minimising waste.

“In addition to advancing our own internal sustainability goals, we are equally focused on a second key aspect of our strategy - helping our customers operate more sustainably,” he says. “This involves analysing their entire flowsheet to identify where our equipment and solutions can improve processing efficiency and reduce environmental impact.”

Weir recognises that the planet's future hinges

on the shift to renewable energy - an evolution that depends heavily on the supply of metals and minerals from its mining customers. To support this, it is essential that the extraction and processing of these resources are carried out efficiently and in line with the mining industry's broader sustainability goals.

“We are constantly evolving our solutions to reduce energy and water usage, which in turn lowers both cost and operational risk for our customers,” he says. “Some of our key innovations include high pressure grinding rolls (HPGRs) for fine grinding, which significantly cut down on energy and water consumption, as well as our energy-efficient CAVEX hydrocyclones.”

He points out that energy often represents the largest single cost category for mining operations, making energy efficiency a key driver not only of sustainability but also of cost control. In parallel, Weir is committed to reducing waste through a circular economy approach which relies heavily on close collaboration with customers. As an example, he highlights how Weir's service centres in South Africa collect



CAVEX hydrocyclones support sustainable operations by boosting efficiency and reducing water and energy use.

metal components from pumps undergoing maintenance, which are then sent to the company's foundries in Gauteng and the Eastern Cape for recycling.

"We are now entering into formal agreements with customers to procure their scrap metal, which will assist in streamlining our supply chains and further reduce carbon emissions," says Mortimer. "This approach allows us to maintain cradle-to-grave oversight of the materials used in our equipment."

Extending the wear life of its equipment is another key element of Weir's waste reduction strategy, while also providing customers with tangible operational advantages, such as increased uptime due to fewer maintenance-related interruptions. Mortimer highlights Wear Reduction Technology (WRT®) as a prime example. Applied to pumps and other equipment, WRT® is engineered to boost wear life significantly, enhancing both efficiency and sustainability.

Among Weir's wide-ranging sustainability initiatives is its investment in renewable energy, particularly at its most energy-intensive operations - namely, its manufacturing facilities and foundries in South Africa. Notably, solar power was installed at its Isando facility two years ago through a power purchase agreement with a third-party provider, marking a significant step toward cleaner energy use.

"This low-carbon source of electricity reduces our dependence on the high-carbon supply from the national grid and enhances our operational stability during loadshedding," he says. "We are also finalising the solar installation at our Alrode manufacturing facility, south of Johannesburg, which will allow us to power the entire operation using renewable energy."

Weir is also making significant progress toward powering its Heavy Bay Foundry (HBF) in Gqeberha, Eastern Cape, with renewable energy. The first phase involves establishing an on-site solar generation facility, while the second phase will see the company enter into a power purchase agreement with an independent sustainable energy provider. This agreement, which includes other major energy users in the region, is set to deliver clean electricity to the foundry starting in 2026. This will



The ENDURON HPGRs are used in crushing applications for fine grinding and use significantly less energy and water than traditional methods.

be through an energy wheeling model whereby the company has direct access to renewable electricity generated from a portfolio of wind and solar projects across South Africa.

"This will allow us to run an annually increasing portion of our HBF operation from renewable sources from the second half of 2026, which will be another significant step towards achieving our sustainability targets," he says.

Community engagement and support form an integral part of Weir's ESG focus, he notes, with these initiatives largely driven by the company's network of service centres. In response to the high levels of socio-economic inequality across many African countries, Weir's efforts include supporting community upliftment projects, donating equipment to educational institutions and prioritising the employment and development of local talent.

"The well-being of the community and the company are closely interconnected, particularly in African countries facing economic challenges," he says. "When a service centre is a major employer in an area with high unemployment, it becomes essential to play a supportive and responsible role wherever possible."

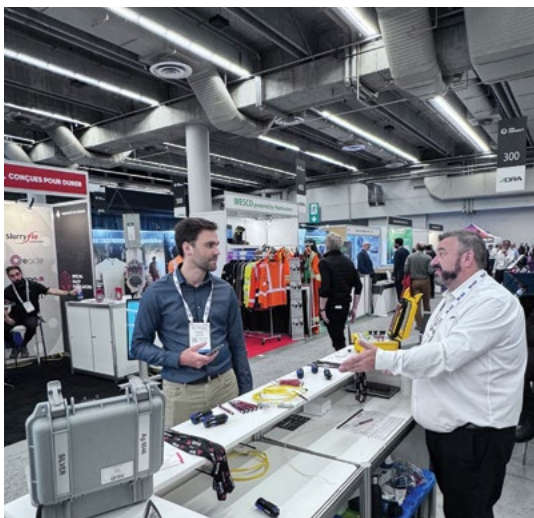
He highlights the increasing need to accurately measure and report on Weir's sustainability performance annually, as mining customers now routinely require this information for their own ESG reporting and supply chain evaluations.

"We frequently receive requests for sustainability data from our larger mining customers operating in Africa; like Weir, they have regular reporting obligations," says Mortimer. "In turn, we expect the same from our own suppliers and are even prepared to support them in efforts to reduce their carbon footprints."

This approach effectively becomes a supplier development function, he explains, as the push for sustainable production must extend throughout the entire supply chain. By aligning its global sustainability strategy with the unique environmental and social challenges faced in Africa, Weir shows that industrial progress and sustainable development can go hand in hand, delivering mining solutions that enhance energy efficiency, promote water conservation, and foster meaningful community engagement. ■

BME's debut at CIM Connect 2025 a success

The mining industry's alignment with global sustainability goals was under the spotlight at CIM Connect 2025 in Montreal in May, with BME Mining Canada attracting considerable attention in its debut appearance among over 600 companies exhibiting at this year's popular industry event.



BME's flagship electronic detonation system AXXIS raised interest at the event.

Hosted by the Canadian Institute of Mining, Metallurgy and Petroleum (CIM), the conference and expo draws thousands of visitors globally – with around 270 technical papers presented. The theme this year was 'Minerals, Innovation and the Energy Transition'. According to Neil Alberts, General Manager at BME North America, the busy event highlighted just how far the mining sector had progressed in its sustainability approach – and how much potential there was for the future.

"The theme of the CIM Connect 2025 pinpointed a vital focus in the mining industry," said Alberts. "What came through strongly in the theme and the presentations was that enabling the energy transition was not just government's role but that of mine operators and their technology partners and suppliers."

Culture of engagement

He emphasised the need for fostering a culture of engagement around sustainability, especially as it affected communities and key natural resources like water. Stronger partnerships are required with community stakeholders, based on efforts by mining industry players to mine responsibly to meet the energy transition's demand for critical minerals.

"Speakers on mining best practice highlighted how the sector is using technology – including digital tools and artificial intelligence – to meet both production and sustainability targets," he explained. "It was also acknowledged that mining is sometimes a slow adopter of available technology, and the role that service providers and supply partners could play in helping accelerate this rate of adoption."

Alberts noted that the ideas and possibilities discussed in the conference sessions quickly found their way to the expo floor, where visitors were on the look-out for practical tools and strategies to pursue the sustainability agenda.

Strong interest

"The level of engagement at our exhibition booth was incredible, with visits from senior executives through to operational professionals – representing potential customers, future partners and even competitors," said Alberts.

Of particular interest was BME Mining Canada's Hydrogen Peroxide Emulsion (HPE) offering, developed by Hypex Bio. As a sustainable explosives solution, HPE represents a significant step forward in delivering enhanced environmental benefits compared to conventional emulsion products.



“Visitors engaged with us on how our Hypex Bio solutions help mines drive their performance in terms of energy transition, critical minerals and engagements with communities and indigenous groups,” he said.

Demonstrating AXXIS

Tom Dermody, International Technology and Field Services Manager at BME, was also at the BME Mining Canada booth and commented on visitors’ enthusiastic response to the company’s offerings.

“As one of only four global blasting and explosives companies exhibiting at CIM Connect this year, it was a great opportunity to meet the industry and engage with delegates on how BME Mining Canada is helping to drive mining’s performance and sustainability imperatives,” said Dermody.

He emphasised the interest that BME’s flagship electronic detonation system AXXIS had raised

at the event, particularly its robust features, ease of use, and its ability to facilitate more energy-efficient comminution through quality blasting and fragmentation. Such was the level of engagement that Dermody conducted over a dozen hour-long practical demonstration sessions on AXXIS during the two and a half day expo.

Canadian facilities

“While there was great appreciation of our solutions and services, visitors were also pleased to know that BME Mining Canada had a local manufacturing base in Sudbury – showing that we are invested in the local industry and committed to our role here,” he explained. “This makes it easier for customers to adopt new technologies and systems, knowing that there is local support and a secure supply chain.”

Alberts highlighted the logistical, distribution, costing and pricing benefits of BME

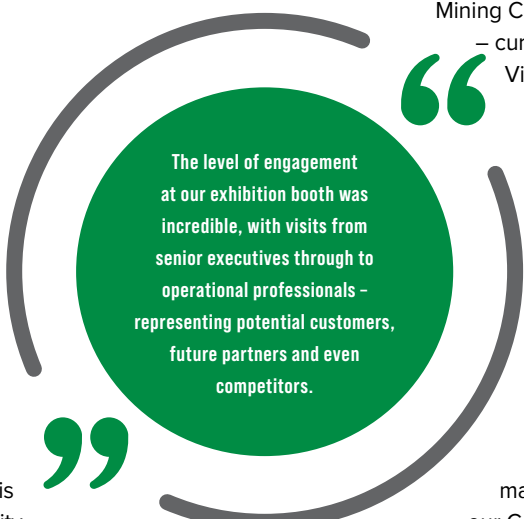
Mining Canada’s Sudbury facility – currently producing BME’s

Viperdet detonators and emulsion explosives, with plans underway to also manufacture hydrogen peroxide emulsion, in partnership with Hypex Bio.

“CIM Connect was a great forum to show stakeholders not only how we have invested in manufacturing assets for our Canadian operation, but

also the proven quality of the equipment and explosives that those facilities produce,” he said. “We were able to communicate the world-class status of these offerings, and the vital technical services through which we support customers.” ■

The mining industry’s alignment with global sustainability goals was under the spotlight at CIM Connect 2025 in Montreal in May.



The level of engagement at our exhibition booth was incredible, with visits from senior executives through to operational professionals – representing potential customers, future partners and even competitors.



Carl Haycock, CEO of Talbot.



CEO Gourish Chakravorty, CEO of ION Exchange.



Lesego Gaegane, Senior Project Manager at the Water Research Commission (WRC).



Wayne Taljaard, Managing Director of WEC Water



Water reuse & recovery - a lifeline for SA's mining sector

With many of South Africa's mining sites located in water-scarce regions, efficient water reuse is becoming a question of survival for mines.

With many of South Africa's mining sites located in water-scarce regions, efficient water reuse is becoming a question of survival for mines.

Efficient water reuse is a crucial strategy for survival and sustainable operations. The Water Research Commission (WRC) has highlighted this issue, emphasising the importance of water reuse schemes to address the country's projected water deficit.

Efficient water reuse and recovery could be a much-needed lifeline for South Africa's mining sector, as water scarcity and infrastructure issues increasingly threaten productivity and revenues, say water sector experts who were speaking ahead of IFAT Africa - the leading conference and trade fair for water, sewage, refuse and recycling in Southern Africa.

Organised by Messe Muenchen India and Messe München GmbH, IFAT Africa will be co-located with analytica Lab Africa, the only trade fair for

laboratory technology, analysis, biotechnology and diagnostics in South Africa. The event will be held in Johannesburg in July this year.

Advisory board members and exhibitors note that more effective water management has become crucial for the mining sector.

Lesego Gaegane, Senior Project Manager at the Water Research Commission (WRC), says: "As we look to IFAT Africa 2025, one thing is clear, water reuse is not only an environmental imperative but a business imperative. Industry must invest now in circular water systems that support sustainable growth, resource efficiency, and climate resilience. Research by the Water Research Commission has demonstrated that mine-impacted water, when treated to fit-for-use standards, can be safely reused, offering both economic and environmental returns. Passive treatment systems, modular reuse technologies, and real-time water quality monitoring



In Gauteng many mines are water positive and they must continuously pump water out to keep the mines dry.

are among the WRC-backed innovations enabling scalable reuse solutions.”

Drivers for change

ION Exchange CEO Gourish Chakravorty says water is a critical resource in the mining and mineral processing industries, serving essential functions such as ore processing, dust suppression, and refining. “These operations generate large volumes of contaminated wastewater, resulting from complex physico-chemical interactions between water, minerals, and processing chemicals. As a result, sustainable water management is imperative—not only to reduce reliance on freshwater resources but also to comply with increasingly stringent environmental regulations,” he says.

WEC Water Managing Director Wayne Taljaard adds: “Traditionally, much of the water used by mining activities ends up as waste. However, through innovative treatment technologies—including advanced filtration, sedimentation, and chemical dosing—this water can be reclaimed and safely reused in the process cycle. Recovered water not only meets operational requirements but also meets regulatory and sustainability targets. Recycling process water reduces freshwater intake, mitigates environmental discharge risks, and lowers costs associated with municipal water sourcing and wastewater disposal. For sites in water-stressed regions, it also provides a critical buffer against supply interruptions.

NuWater BD Specialist James Morisse says: “Water scarcity, coupled with tightening environmental regulations, is driving a vital transformation in mining and other water-intensive industries. Long recognised as major water users, these sectors now face growing

pressure to reduce their environmental impact and improve operational resilience in a water-constrained world. Effective water management is no longer optional—it’s a cornerstone of sustainable progress.”

Innovation to drive efficient water management

NuWater’s Morisse says innovative technologies are at the heart of the shift mines need to make: “Advanced treatment methods such as reverse osmosis, membrane filtration, and electrodialysis are enabling the purification of varied water sources—including process streams, mine drainage, and tailings pond water—so they can be reused throughout operations. This closed-loop approach significantly reduces reliance on freshwater, easing stress on local ecosystems and ensuring greater water security, especially in drought-prone regions. The benefits are not only environmental. Water reuse delivers clear economic gains by lowering the costs of water procurement and discharge. By embracing these practices, mining and water-intensive operations enhance sustainability while improving long-term profitability.”

Hennie Pretorius, Technical Sales Specialist at Maskam Water says: “Water recovery and reuse at mines is prescribed by law and regulated according to the mine’s Water Use Licence from the Department of Water and Sanitation. This is also applicable to other industries. To improve ESG scores, it is imperative for the sector to make use of alternative water sources and reduce reliance on ground and municipal water supply. Onsite sewage treatment for water reuse addresses this challenge.”

“Several mines and industrial sites are not only recovering their process water for reuse but also eliminating the use of conservancy tanks and septic tanks by utilising modular sewage treatment plants to treat sewage to DWS General Limits. Not all modular plants are created equal, so mines should consult experts to select a modular sewage treatment plant that can do complete Biological Nutrient Removal,” he says.

Ronald van Lochem, CEO at Aquadam Steel Tanks International, points to tank design as an important factor in water recovery and reuse for mines. “With increasing water scarcity and stricter discharge regulations, industries must implement systems that capture, store, and reuse process water reliably. New FBE (Fusion Bonded Epoxy) coated steel tanks offer a groundbreaking solution for this challenge. These tanks are designed to withstand the harsh chemical and abrasive conditions often found in mining and industrial water systems. The FBE coating provides superior corrosion resistance and extended tank lifespan, even in aggressive environments such as tailings water storage, process water recovery, and effluent holding.”

Low hanging fruit

Thomas Coetzee, Engineering Manager at Memcon, says the lowest hanging fruit for water recovery and recycling at mines is treating utility streams, such as acid from process streams. “Membrane technology can be used to recover water and unreacted acid from process streams, offering a powerful four-fold benefit. First, it significantly reduces the need for fresh water in acid make-up, since the bulk of the liquid involved is water. Second, by recovering and reusing acid, the consumption of expensive chemicals—often making up 70% of a process’s operating costs—is drastically reduced, leading to major savings. Third, it decreases the demand for neutralizing chemicals like

Water reuse in mining and heavy industry offers significant economic, environmental, and operational benefits.



lime. Fourth, it reduces the volume of high total dissolved solids (TDS) in effluent streams that must be treated and discharged, improving environmental compliance. This innovation supports positive outcomes in ESG performance, operating expenditure (OpEx), water footprint, and overall sustainability—especially critical in industries historically dependent on large volumes of water,” he says.

Coetzee says membrane plants are fully modular and custom-designed to the required scale, delivering strong ROI despite their higher upfront cost. For clients with CapEx constraints, Build-Own-Operate-and-Manage (BOOM) models offer a practical path forward.

ROIs on reuse

Carl Haycock, CEO of Talbot, notes that because mines use water so extensively in their processes, water outages can seriously impact operations. “If water supply is disrupted, production stops.

Because of the losses associated with lost productivity, and the rising cost of water, we have reached the inflection point for water recovery vs buying water,” he says.

“In Gauteng, parts of the North West and Free State provinces, many mines are water positive and they must continuously pump water out to keep the mines dry. That water can be treated and used. In addition, hundreds of megalitres of acid-bond drainage water is being treated, neutralised and essentially discharged into rivers. However, water can be recovered an infinite number of times. What stands in the way is the cost,” he says.

Haycock says: “With water recovered from mines, you’ve got suspended solids, rock flour, oils and greases from underground workings, nitrates, nitrites, E. Coli, uranium, manganese, etc. But it is possible to treat this water to a potable standard, sometimes more cost effectively than buying it from a municipality, especially where you are using significant volumes.

WRC’s Gaegane says that financing remains a key barrier. However, models like Public-Private Partnerships (PPPs), Build-Operate-Transfer (BOT), and Build-Own-Operate-Transfer (BOOT) offer viable frameworks. She says: “An emerging frontier is resource recovery capturing hydrogen and critical minerals during treatment processes, turning waste into value. Still, challenges such as high upfront costs, inconsistent water quality, and complex regulations must be addressed through coordinated policy and strong cross-sector partnerships.”

Thabo Kabini, Senior Specialist: Water Infrastructure at IDC, says water reuse in mining and heavy industry offers significant

economic, environmental, and operational benefits.

“Initial investments in water reuse systems such as treatment plants and advanced filtration technologies, can be high. However, these costs are often offset by long-term savings in water procurement and waste management. For instance, a water reuse facility at a platinum mine in South Africa achieved a payback period of less than four years, with a 50% reduction in potable water use.

Various financing models support water reuse projects. Blended financing, combining public and private funds, is common,” he says.

Kabini adds that programmes like the World Bank’s Scaling Re-Water initiative help unlock financing by reducing investment risks and transaction costs. Additionally, public-private partnerships (PPPs) and green bonds are increasingly used to fund sustainable water infrastructure.

Decentralisation and PPPs

Tumelo Gopane, industry consultant and IFAT Africa advisory board member, says reused water from a properly managed wastewater treatment plant is cheaper than purified raw water.

To drive progress in water reuse, Gopane says: “Governments need to consider decentralising the provision of water and sanitation. This will require laws to be amended, regulatory authorities to be introduced to support competition and tariff setting and allowing decentralised systems. This also means better defined compliance standards including personnel requirements, enhanced compliance monitoring with impactful consequences. A shift towards private sector participation in water and sanitation should also be considered. This means being more transparent regarding cross subsidisation, which cannot be avoided, considering that poorer communities will require to be subsidised if MDG 6 is to be attained. This will unlock blended finance in the form of grants and loans, and would unlock PPPs / Concessions in water and sanitation.”

Experts from various sectors will discuss the trends, challenges and solutions for Africa’s water, wastewater and refuse management sectors at IFAT Africa 2025. At this forum and exhibition, hundreds of stakeholders from around the world will come together to explore new and innovative products, expertise and technologies, and to consider solutions.

IFAT Africa and analytica Lab Africa and will be staged at Gallagher Convention Centre in Midrand from 8 - 10 July 2025. ■



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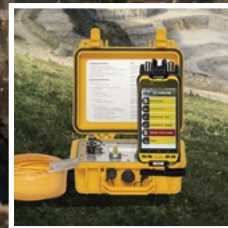
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Botala Energy: a saviour in SA's impending gas cliff?

ASX-listed Botala Energy recently inked a binding letter of intent (LOI) with SCAW South Africa for its Serowe coal bed methane project in Botswana. The LOI is significant as it offers SCAW South Africa the opportunity to secure gas and side-step South Africa's impending gas shortage, CEO Kris Martinick tells *Modern Mining*.



Drilling underway at the Serowe project.



CEO Kris Martinick.

Established in 2018, Botala Energy is focused on developing its 100% owned Serowe Coal Bed Methane (CBM) project located in a high-grade CBM region of Botswana. The company was recently granted environmental and mining licence approval for the development of its gas project, complete with a 100 km pipeline from its wellfields to the proposed Leupane Energy Hub and Industrial Park.

The Serowe CBM project, targeting commercial production of gas by late 2027, remains well positioned to supply gas into the energy constrained south-central African region, in particular, Zambia and South Africa.

Botala Energy is set to produce 3.5 petajoules per annum of gas in Phase 1, with an additional 10.5 petajoules per annum in Phase 2 and 20 petajoules per annum by 2032.

According to Martinick, the company has been approached by several Tier One mining firms operating in Zambia's Copperbelt and in the southern Democratic Republic of Congo (DRC) for potential off-take agreements.

With South Africa being on the cusp of a gas supply cliff, industrial sectors reliant on gas continue to pivot to new sources of clean energy.

"Following the announcement by Sasol that it

will cease to supply gas to key regions in South Africa by 2027, Botala has been inundated with interest for LNG from gas users in South Africa," said Martinick.

In August 2023, petrochemicals giant, Sasol, advised industry that from June 2027, the gas provider would no longer supply natural gas and methane-rich gas to industrial gas users and traders in Mpumalanga, Gauteng and KZN.

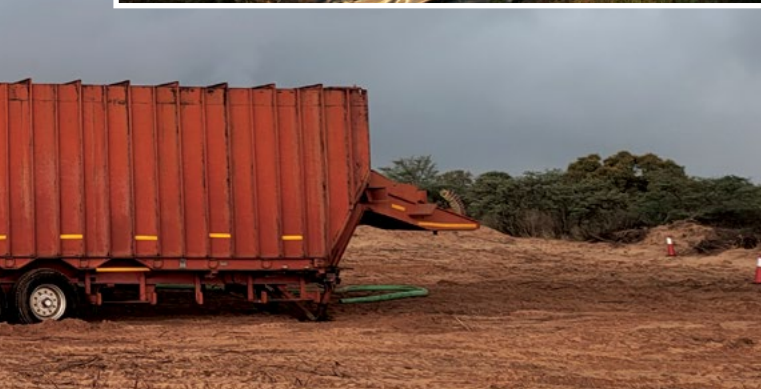
Sasol procures natural gas from Mozambique for its own process needs and sells the balance to traders and industrial gas users. However, owing to declining reserves, Sasol will no longer be able to supply the local industry with gas, which places industrial uses and traders in a precarious position and seeking solutions to meet their gas needs.

SCAW South Africa MoU

While the Australian listed clean energy company has non-binding agreements with Future Fuels and Novo Energy, in March, it signed its first binding agreement with South Africa's SCAW Metals.

The agreement provides SCAW Metals with exclusive rights to procure up to 3.5 PJ/a (100% of Phase 1 Gas) of LNG from the Serowe CBM Project, with an option to expand to 4.7 PJ/a as production scales.

The main production well.



The agreement includes three sub-agreements, namely a collaboration to advance Botala Energy's bankable feasibility study, project construction and gas delivery to Johannesburg in South Africa.

"The commitment de-risks the project, establishes SCAW as a contracted customer and supports commercial viability as Botala advances towards project development. The agreement will integrate SCAW into the Bankable Feasibility Study (BFS), align infrastructure development, logistics and delivery optimisation. Moreover, the BFS findings will guide the final LNG Sale and Purchase Agreement (SPA)/Gas Sales Agreement (GSA)," explains Martinick.

Completion of the BFS is earmarked for August, this year.

Serowe CBM project

The Serowe project, situated near the town of Serowe in the central district of Botswana, consists of 420 000 hectares of prospecting licences in the Karoo-Kalahari Basin.

"Botala's exploration initiative aims to unlock the massive CBM potential in the region, targeting high-grade focus areas, or 'sweet spots', and developing procedures to stimulate CBM flows in commercially attractive volumes," says Martinick.

Exploration initiatives in 2024 resulted in a massive increase in the 2C contingent resource from 24 billion cubic feet (bcf) to 454 bcf. To date, Botala Energy has drilled 11 wells within its tenement, which has a total prospective resource of more than 7 trillion cubic feet (tcf) within the Serowe project area.



Core samples from the Serowe CBM Field.

"We have only drilled 11 wells across 420 000 hectares and have sufficient gas to underpin our existing project for the next 20 years. Importantly, we have only explored 5% of our acreage, which means that our exploration potential is massive."

Discussing the gas extraction method, Martinick explains that the extraction technique leaves coal *in situ*; significantly reducing the CO₂ footprint.

"As it stands, flow assessments in the field are ongoing, with one well flowing well and four more in the process of being brought online. It is important to note that while Botswana is a landlocked country, bringing the Serowe Project into production allows Botswana to link to the south-central African region as it meets some of the region's clean energy needs."

Construction and development

While Botala Energy has, since 2019, invested A\$14.5 million in taking the project up the value curve, it expects to inject a further A\$150 million in the project construction phase.

The company expects to finalise the bankable feasibility study by August this year and move into construction and project development within the next two years.

Botala Energy anticipates a 21-month construction time, with gas delivery by the end of 2027.

"We expect a 21-month construction timeframe, inclusive of



Prestart safety meeting.

the six-months of detailed engineering, and expect to begin commercial gas delivery just after the onset of the gas cliff in South Africa with an initial tranche of 3,5 petajoules per annum of gas.”

Although Botala Energy has the option to establish a pipeline to transport gas to South Africa, the preference currently is to truck the liquefied natural gas (LNG) to Johannesburg, 650 kilometres away.

“Botala’s ability to recover clean energy from its flagship CBM project is a fantastic opportunity that should encourage investors to participate in project development. Once in production, the Serowe project is set to have an enormous impact on the region, satisfying some of Botswana’s and South Africa’s energy needs. Apart from creating jobs, the gas resource allows Botswana, a landlocked country, the opportunity to open new trading avenues in southern and central Africa.”

Solar and hydrogen offering

In recognition of the global transition to renewable energy, Botala is developing the following opportunities in addition to its main focus on CBM exploration and development:

- Serowe Energy Hub: proposal for a 20 MW solar/gas hybrid plant to feed electricity into a nearby substation, and
- Leupane Energy Hub and Industrial Park: proposal for:
 - Leupane Energy Hub: Targeting a 700 MW solar/gas hybrid plant near the Morupule power station to feed electricity into the domestic and Southern African Development Community (SADC) networks via the Southern African Power Pool (SAPP), and
 - Leupane Industrial Park: to provide space and services (adjacent to the Leupane Energy Hub) for new-age industries attracted by reliable and affordable energy, its favourable geographic location with access to the SADC markets and its ports for export to Asia and Europe, attractive investment climate, presence of a skilled work force, and access to research facilities.

In partnership with Serowe Solar Consortium, Botala Energy recently won a tender to develop the four MW Phuthi Solar PV plant in the Serowe Energy Hub. A 250-megawatt solar project



Botala Dual listing on the Botswana Stock Exchange. On the left is Tsametse Mmolai, Head of Listings and Trading, Botswana Stock Exchange, centre is Botala Non-Executive Director Peter Grant and right is Botswana Country Manager Modisana Botsile.

is also in development.

The company has inked a partnership with Solar Finland to establish photovoltaic (pv) Solar Panel Manufacturing facility in Botswana using Solar Finland’s SolaTM technology.

Further to this, with an eye to advancing its hydrogen aspirations, Botala Energy has also partnered with Pure Hydrogen.

“The collaboration with Pure Hydrogen allows both companies to focus on their respective strengths while working closely together. Pure Hydrogen is developing an innovative hydrogen technology which, once proven, will be implemented in Botswana. Our primary focus is on extracting gas and developing solar projects, with hydrogen projects being a secondary arm of the business.”

While the CBM project developer has a highly attractive portfolio of assets, it remains grossly undervalued amongst its peers, Martinick says.

“We have a fantastic project pipeline, situated in an extremely favourable jurisdiction equipped with a well-educated and well-trained community.”

Community development

The Serowe project will do much to alleviate Botswana’s high unemployment rate, which stands at around 25%. However, Martinick is quick to explain that most of the employment will arise from secondary opportunities associated with the project.

“For every job we create upwards of six indirect jobs will be developed such as cleaners, security guards, etc. Botala remains highly engaged with the host community, working together to unlock further job opportunities. We have established a company called Grow and Eat, which targets market gardens, and are collaborating with the local community in purifying wastewater from our processes for use in crop farming. We see these initiatives being highly impactful in the community, being more than just the gas extraction.”

“One percent of the revenue stream from the 4MW solar project will go towards social initiatives, including the SOS orphanage in Serowe. The Martinick family are strong backers of the orphanage.” ■

Springlake acquisition expands Menar's anthracite footprint

Menar hopes to strengthen its participation in the anthracite market by adding the KwaZulu-Natal-based Springlake Colliery to its portfolio.

Menar acquired the anthracite mine, Springlake Colliery, from Mylotex (Pty) Ltd after the mine was placed under business rescue. The acquisition was executed through a Sale of Assets Agreement between the two companies, which was signed in November 2024. The transaction was finalised and concluded on 01 May 2025, officially transferring ownership of the mine to Menar.

"We are optimistic about Springlake Colliery's future, considering the growing demand for high-quality energy sources globally. This acquisition takes us forward and highlights our diversification efforts as a company," remarks Menar's Managing Director, Vuslat Bayoglu.

Menar views Springlake Colliery as a strategic asset that strengthens its portfolio, aligning with the company's broader vision to expand its footprint and pursue opportunities across the global anthracite value chain. Anthracite is a preferred reductant in key industries such as steel manufacturing and ferroalloy production, amongst other vital sectors. It has unique properties, like high calorific value and clean-burning characteristics.

Located in Dannhauser, approximately 45 kilometres from Newcastle, Springlake is an underground mine with the capacity to produce an estimated 60,000 tonnes of run-of-mine anthracite per month. The mine yields a niche product suitable for export markets in parts of Asia, Europe, and South America. It also supplies local customers.

With a substantial track record of acquiring assets and turning them around, Menar is well-positioned to optimise the



Springlake colliery.



Springlake processing plant.

mine's operations. This will ensure that Springlake continues to add value to South Africa's economy while sustaining jobs. Currently, the colliery directly employs around 300 people, excluding contractors. The company intends to invest in Springlake to address the issues that led to it being placed under business rescue. Furthermore, Menar aims to source suitable customers for the product mined at Springlake. ■



Springlake has the capacity to produce an estimated 60,000 tonnes of run-of-mine anthracite per month.

Training unlocks performance

KOMATSU 



SEW-Eurodrive rolls out plans, investment in its African strategy

It has been another exciting year for SEW-EURODRIVE South Africa with its 'African Strategy' moving steadily towards fulfilment and the company's technical capability growing by the day.



Raymond Obermeyer, Managing Director of SEW-EURODRIVE.

According to Raymond Obermeyer, Managing Director at SEW-EURODRIVE South Africa, the times are not without their challenges – including geopolitical instability continuing to disrupt supply chains. However, this has not slowed down the business's operations nor dampened its ambitions, says Obermeyer.

“Being part of a global group gives us the flexibility to adapt our sourcing strategies, and that has been, and still is, a significant advantage for us and our customer base,” he explains. “Our stockholding remains strong and reliable, allowing us to easily meet the large orders we won in the past year.”

He highlights that SEW-EURODRIVE South Africa serves multiple markets – from mining and automotive to food and beverages manufacturing, processing and packaging – many of which are flourishing while others are more cyclical.

“Importantly, we continue to pursue our African Strategy,” he says, “and have steadily opened up more direct involvement in many countries including Cameroon, Côte d'Ivoire, Mauritania and Morocco. This is in addition to our cross-border markets further

south like Kenya, Tanzania and Zambia.”

This expansion into the continent is driven by a long term plan looking ahead to 2030, and he emphasises that the progress to date has been built on meticulous planning. These ambitious plans include a considerable investment in a second phase of the company's headquarters, service centre, training academy and warehouse in Aeroton near Johannesburg.

Construction on this expansion began in November 2024, and the facility will be operational by the end of 2025, so that its activities can hit the ground running in 2026. This will further support the company's expansion of its sales, support, engineering and training capabilities. Appointments of key staff for the facility are already being made, and 20 to 30 more people are likely to be put in place over the course of this year.

“The critical challenge facing the users of industrial gearboxes in local markets is the level of support being provided for the products being sold,” he argues. “As we work towards being the market leader in Africa, this is squarely where our focus lies – being able to service and repair



SEW-EURODRIVE's new PPK planetary gear unit offers a compact high performance solution ideal for space-constrained industrial applications requiring robust torque transmission.



SEW-EURODRIVE offers expert industrial gearbox repairs, delivering OEM-quality restoration to extend equipment life and minimise costly downtime for industrial operations.

everything we sell, quickly and efficiently.”

This means the ability to support a growing range of products as new markets are opened and innovations are launched. He goes further to say that this technical capability is even growing to include other OEMs' equipment, which SEW-EURODRIVE South Africa has the capability to support cost effectively and to the highest standard.

“We are one of the few OEMs in the country who has the advanced design and engineering infrastructure – including our access to the group's world class facilities in Germany – to deliver this service,” he says. “We can even provide the same warranties on the work we conduct on other OEM's componentry and gearboxes, as our quality standards are so rigorous.”

Among the activities housed in the new facility will be the company's existing industrial gearbox repairs division, and there will be additions to the equipment fleet to augment the services that it

will provide. Obermeyer says the plans include the installation of state-of-the-art equipment like robotic welders and five-axis machines for gear cutting and bringing aspects like base plate fabrication and sand blasting in-house. Considerable investment is also being made in crange capacity.

He emphasises skills development as a key enabler for the company's service and repair focus which is the rationale for expanding its Drive Academy. The academy provides specialised training not only for SEW-EURODRIVE South Africa's people, but also for customers and partners around the continent.

“As we grow our local capability, and roll out our service centres across Africa, we rely on building our skills base,” he says. “Our people must be skilled and experienced in a range of functions and equipment – such as our full rewinds and other motor repairs as well as machining and fabrication.”

A high level of expertise in the field service teams is also essential to customers – especially those in remote areas where access to infrastructure is more difficult. This, he says, is another vital aspect of the company's strategy to ‘close the loop’ with solutions and services that enhance customers' uptime and performance.

“The Drive Academy continues to be a valuable resource for us and the broader industry, which is why we are planning to give it much more space when it moves to our new facility,” he says. “There will also be more trainers in place by the time we move it over.”

The growth plans are also being driven by new markets where SEW-EURODRIVE South Africa is finding suitable products within the group's global offering. Recently, this has even included the agricultural sector, where a comprehensive gearbox solution for centre pivot irrigation systems is now available to local farmers.

“We are responsive to these opportunities, as we have shown over the past five years or so with our planetary gearbox range which now serves applications as diverse as automotive, mobility and conveyors,” he explains.

This year alone, the group has already launched 16 new products – pushing the boundaries in terms of industrial gears, geared motors, electronics and artificial intelligence. This reflects the innovative approach and the research and development capability that is driving opportunities into existing and new markets, he says.

“What's important is that the innovation is driven from the ground up by the SEW-EURODRIVE operations around the world,” says Obermeyer, who sits on global steering committees to guide the various aspects of technological innovation. “This is crucial to keeping our solutions aligned with our customers' real daily needs and priorities.”

He concludes that SEW-EURODRIVE South Africa is committed to keeping up its investments in Africa, to proactively drive the business to meet the market's current and future needs.

“We understand clearly that companies who want to be leaders in 20 years' time must make real commitments now,” he says. “Gearboxes are always going to be a fundamental part of production – from minerals to cars and food – so we must stay ahead to keep the wheels of industry turning across Africa.” ■

Designing transformers, substations for resilience on Africa's mines

Electrical equipment at mining operations in Africa face multiple challenges, such as variable voltage supply and high ambient temperatures, demanding innovative solutions to ensure reliability and performance while not incurring excessive cost through over-designing.



David Claassen, Managing Director of Trafo Power Solutions.



Trafo Power Solutions, which designs and supplies electrical solutions including transformers and sub-stations, has wide experience in dealing with these conditions across the continent, according to Managing Director David Claassen.

“In all projects, it is vital to understand that every electrical solution on a mine is affected by the broader ecosystem of infrastructure,” says Claassen. “For instance, it is not uncommon to find that a national power grid delivers an unstable voltage supply which can affect how equipment performs as well as its longevity.”

The voltage fluctuations on the supply network in some countries and regions can reach 15 to 30%, he explains, so the products that are designed and installed to meet the customer’s operating specifications must also accommodate such factors that are outside of the mine’s control.

“It takes considerable ingenuity to achieve the right balance – with a solution that is fit for purpose but remains economically cost effective,” he says. “This is particularly important for remote operations – many of which run continuously – where it is costly and time consuming to attend to equipment that fails due to excessive voltage fluctuations.”

Even if components like surge arrestors or switchgear can be quickly replaced, voltage fluctuations still pose a serious risk

to the transformer itself if it hasn’t been specifically designed to withstand such conditions. Transformers are critical assets with long manufacturing lead times and their failure can halt production entirely — leading to severe economic consequences for the operation.

“In environments like these, we collaborate closely with our customers and technology partners to develop tailored solutions that address their unique challenges,” he says. “The resilience we build into our products directly supports the operational reliability our customers depend on.”

Claassen emphasises that in mining environments the reliability of electrical equipment is just as critical as its performance and must be deliberately factored in during the design phase. He notes that many African mines also contend with high ambient temperatures, often intensified by prolonged exposure to direct sunlight, which can accelerate the ageing of electrical equipment if not properly accounted for in the design and choice of materials.

“To ensure our equipment operates within safe temperature limits, we explore a range of cooling options,” he explains. “Depending on the specific environment, we typically design transformer and electrical enclosures with either natural



Modular substations from Trafo Power Solutions simplify logistics, reduce civil works and enable rapid deployment in remote mining locations.



High ambient temperatures and direct sunlight on mine sites demand robust thermal management in electrical equipment design.



Trafo Power Solutions leverages modular design and preassembly to deliver high performance electrical systems with faster turnaround times and reduced onsite complexity.



ventilation or forced-air cooling systems to effectively manage heat dissipation.”

However, in space-constrained environments, water is also employed as a cooling medium, either through direct contact to extract heat from the transformer or via a water-to-air heat exchanger, where water cools the air which in turn cools the equipment.

In addition to high temperatures, many African mine sites contend with excessive dust levels, requiring transformers and substations to be equipped with robust ingress protection. This must be carefully balanced with the cooling design as higher ingress protection typically limits the natural airflow needed for effective cooling.

In addition to its strong track record in South Africa, Trafo Power Solutions has extensive experience in the Copperbelt region of Zambia and the Democratic Republic of Congo (DRC) as well as in countries like Mozambique and Sierra Leone. The company has worked across both surface and underground mining operations, where design considerations vary significantly with surface applications requiring resistance to sunlight and dust while underground environments demand solutions tailored to limited space.

“Space constraints in underground mines affect not only the areas where electrical equipment is installed but also the pathways and conveyances used to transport that equipment,” says Claassen. “Shaft cages - particularly in South Africa’s deep level gold mines - are often compact and space-efficient so we have developed specialised solutions that can be transported in these confined

spaces and easily reassembled on site.”

Further strengthening the company’s underground expertise is the experience of its Italian technology partner, TMC Transformers, which has a long history of serving the marine sector. Claassen notes that TMC’s work in designing transformers for marine vessels has provided valuable insights into optimising performance in confined spaces - a capability that translates well into the underground mining environment.

“Taking all these factors into account, we often find that a modular design is the most effective way to meet customer specifications,” he explains. “Manufacturing and assembly can be completed under controlled workshop conditions, ensuring quality and consistency. Our modular substations typically incorporate medium and low voltage switchgear, transformers and uninterruptible power supply (UPS) systems with all configured for efficient road or sea transport and straightforward connection and commissioning on site.”

This approach is especially effective for remote sites where access to specialised electrical personnel is limited. By eliminating the need for traditional brick-and-mortar structures, it also reduces on-site civil construction requirements, shortens project timelines and cuts down on travel costs for skilled labour.

“These solutions have been well received in fast developing mining regions like the DRC, where project timelines are often tight,” says Claassen. “The modular approach also helps .reduce project risk, as all testing and certification are completed before the substation leaves the workshop.” ■

Underground mining environments require compact, modular electrical systems that can be transported through constrained access points like shaft cages.



Investment in electric forklifts aligns with many businesses' Environmental, Sustainability and Governance (ESG) strategies.

Electric forklifts lead the charge in materials handling

As industries transition toward more sustainable and efficient operations, electric forklifts powered by lithium-ion batteries are leading the change. With zero emissions, faster charging times and enhanced energy efficiency, these forklifts are revolutionising material handling.

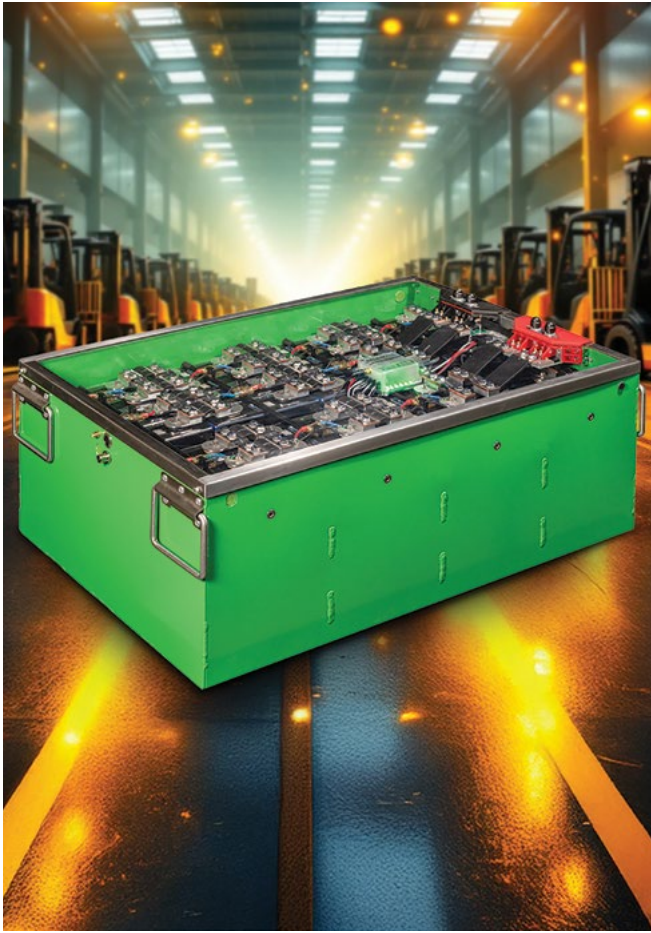
In addition to their environmental and operational benefits, many electric models are equipped with advanced safety and usability features, further streamlining workflows and boosting productivity.

Jenna Botterill, Corporate Sales Executive of Toyota Material Handling, a division of CFAO Equipment, says beyond the obvious environmental advantages of owning or renting electric forklifts, there are operational and financial benefits too.

"Operations no longer need to store diesel fuel on-site, reducing the risk of contamination and creating a safer work environment. The shift to electric also eliminates the potential for fuel theft, a significant concern in the South African market."

Investment in electric forklifts aligns with many businesses' Environmental, Sustainability and Governance (ESG) strategies. "This is an added incentive as operations that reduce their carbon emissions and achieve their sustainability goals are afforded tax rebates by government," notes Botterill.

Addressing concerns relating to the performance of electric forklifts, she notes that electric forklifts are on par with their diesel counterparts in key areas such as travel speed, lifting and lowering capabilities, ground clearance and overall efficiency. "Not only do they deliver power in motion, but they can also operate on the same types of terrain as diesel forklifts."



Electric forklifts powered by lithium-ion batteries are leading the change.

One of the most common customer concerns is whether electric forklifts can perform in wet weather. “Today’s electric forklifts are highly advanced, featuring roof covers and sealed compartments that protect electrical components. To add to this, our forklifts are IPX4-rated, meaning they are resistant to splashing water from any direction, ensuring that they operate in all weather conditions,” adds Botterill.

From a costing perspective, investing in electric forklifts makes sense. Toyota Material Handling consultants use a data-driven calculator to determine the ROI for customers who are considering converting from a diesel to an electric fleet.

“When calculating the ROI, we take the forklift’s total running costs into consideration. This is made up of the rental portion, maintenance portion and the fuel consumption component. On average, a medium utilisation application will require roughly R6,500 worth of diesel per month to run a single machine. When calculated over a rental period of 60 months, it amounts to about R390,000 annually. A fleet of 10 units could equate to R3.9 million worth of diesel needed to “feed” the fleet over a 60-month period,” explains Botterill.

Today’s electric forklifts are highly advanced, featuring roof covers and sealed compartments that protect electrical components.

The average running cost for electric units, on the other hand, amounts to about a tenth of the cost of running diesel units. Botterill says Toyota Material Handling Forklift sales consultants work with their customers to establish the ROI based on their specific utilisation, site application and shift patterns, amongst other considerations. “We walk the path hand in hand with our customers to ensure the change in equipment specification makes both financial and functional sense.”

Notably, no special setup is required to accommodate electric forklifts. With the old specification lead-acid batteries, operations need a battery bay, an extraction system and a gantry to remove and insert batteries, which means additional space and investment are needed. When lead-acid equipment is run over double shifts, two lead-acid batteries are required, one in the machine while in operation and one on charge, with each battery taking eight hours to charge and a further four hours to cool down. This is an expensive and time-consuming exercise.

“By comparison, lithium-ion batteries only require 50 minutes of charging per day. We also encourage our customers to ‘opportunity charge’ their batteries – shorter charges during teatime, lunch breaks and shift change to reduce work interruptions,” notes Botterill.

Today, electric forklifts boast numerous features that enhance their safety and operability, for example, Toyota Material Handling’s 8FBE and 8FBN forklifts incorporate an anti-rollback feature to facilitate incline work. When the accelerator or brake pedal is released while stopped on an incline, the forklift stops and then descends at a constant speed, ensuring smooth operation on slopes.

Botterill highlights a lesser-known feature of the 8FBE and 8FBN model: The Rear Pillar Grip Assist Handle with Hooter. “About 90% of accidents occur when forklifts travel in reverse as drivers often twist and turn in their seats to see reverse travel direction,” says Botterill.

Recognising that about 50% of work is conducted in reverse, Toyota Material Handling developed the Rear Grip Assist Function with a built-in horn. This improves comfort and safety during reverse travel and allows drivers to easily activate the horn while backing up. By using this function, drivers can pre-warn any pedestrians or oncoming vehicles with ease.

Botterill says no other forklift manufacturer has incorporated weighing system scales onto their equipment. “Our forklifts have load scales as a standard feature, meaning operators get real-time weight readings, allowing them to accurately assess loads, avoid overloading and optimise the material handling process.”

The benefits of owning electric forklifts are underlined by their speed, agility and efficiency. “Toyota Material Handling’s electric forklifts are true examples of power in motion. They are environmentally cleaner, easier to handle, longer lasting, quieter, cheaper to maintain and more efficient. This means they move more pallets per hour, helping to boost efficiencies in every industry,” concludes Botterill. ■

Multotec opens test work and showroom facility to local and global clients

Metallurgy and process engineering specialist, Multotec, has opened its consolidated research and development and test work facility, designed to improve process flow to efficiently serve the global mineral processing industry. This facility, located in Spartan, outside Johannesburg, now boasts a showroom for an enhanced customer experience.



Faan Bornman, Technology Manager – Processing Equipment, Multotec.



Chris Oldewage, Technology Manager – Screening Media, Multotec.

The Multotec technology division conducts comprehensive test work for clients who supply material for testing. This service supports the continuous improvement and development of Multotec’s equipment range. Multotec’s test work services are available to assist the global mineral processing market, tertiary institutions, and both customers and non-customers.

Range of test work capabilities

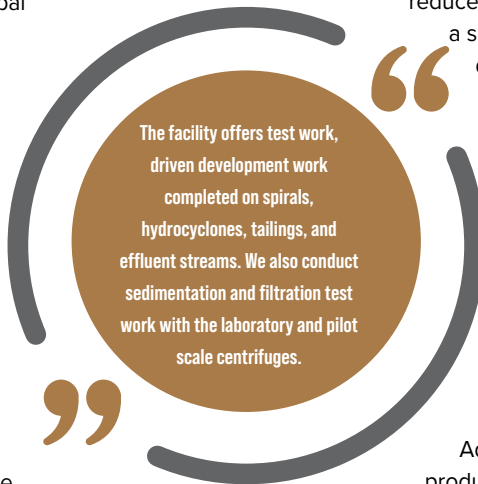
“The facility offers test work, driven development work completed on spirals, hydrocyclones, tailings, and effluent streams. We also conduct sedimentation and filtration test work with the laboratory and pilot scale centrifuges,” explains Faan Bornman, Technology Manager – Process Equipment at Multotec.

“In terms of screening media, we test materials such as rubbers and polyurethanes, different aperture profiles, perforated thicknesses, and wedge wire type of screen equipment. Our facility features a vibrating screen, sieve bend and static drain screens, a trommel screen, and a pump cell for interstage

screening,” says Chris Oldewage, Technology Manager – Screening Media at Multotec.

Commenting on the main benefits that Multotec’s research and test work facilities provide to customers and the broader mineral processing industry, Bornman says that the test work reduces project risks and provides a solid foundation for the design and optimisation of process facilities.

“



The facility offers test work, driven development work completed on spirals, hydrocyclones, tailings, and effluent streams. We also conduct sedimentation and filtration test work with the laboratory and pilot scale centrifuges.

”

“It is also about optimising process flows and processing minerals in a more cost-effective way. Through our test work, we confirm throughput rates on existing plants because we test on production-size equipment.

Additionally, we test for product and process efficiencies and recoveries. For example, we determine how much mineral a client can expect to recover from their spiral and cyclone tests,” he says.

Furthermore, Bornman notes that the test work can predict specific outputs and improve plant efficiencies for brownfield applications, with Multotec being able to compare its test results with a client’s real plant scenario.



Multotec tests screening media materials such as rubber, polyurethane, wedge wire with various apertures, and thickness.



Multotec boasts a showroom and training areas for enhanced customer experience.



Multotec's test work facility helps customers to optimise their processes while reducing project risks.

Enhanced customer experience

The recent expansions to Multotec's showroom and training areas have significantly enhanced the customer experience. The facility now showcases a full spectrum of its equipment in plant size and scale versions. Additionally, more common items such as Multotec's latest range of spirals are also on display.

Bornman says that customers are encouraged to visit the consolidated facility, to experience firsthand how the equipment operates and see the production and workshop facilities in action.

Oldewage adds that, from a customer experience perspective, being able to see the equipment often sparks curiosity and a desire to learn more. "Seeing and feeling the equipment offers a much better experience than just hearing about it, which normally makes a huge difference," he says.

Various commodities are supported by these advanced test work facilities, including chrome, coal, copper, gold, iron ore, mineral sands, platinum, lithium and chemical salts, among others. Multotec has also recently conducted environmental focused test work for a company that recovers electronic waste.

Tertiary education synergy

Multotec's commitment to nurturing future potential extends beyond financial support, the company provides work experience to students during the holidays with preference given to its bursary students. "We are happy to help students with their practical work, and it also gives us the opportunity to identify promising talent who could join Multotec in the future. Students are able to gain invaluable experience by helping us get some of our smaller projects off the ground. We also have Master's Degree students who come to work on our equipment," says Bornman.

"The facility is there to serve the industry. It is an opportunity to help customers optimise their processes, ensure efficient operations, and work on better recoveries. It's about innovation and listening to the needs of clients," he concludes. ■

Digging for a new deal

By Dr Ross Harvey, director of research and programmes at Good Governance Africa (GGA)



Dr Ross Harvey, director of research and programmes at Good Governance Africa (GGA)



The vision for mining needs focus on attracting exploration investment for minerals of the future.

Many of you will be aware that the South African Department of Mineral and Petroleum Resources (DMPR) has just gazetted its latest set of proposed amendments to the country's mining legislation. A public comment window has been opened until mid-August. An examination of the amendments makes it hard to think of anything that sends a stronger signal that South Africa is not open for responsible business. Responsible investors must account for why they spend a dollar in one country and not another. Investing in mining in South Africa has become increasingly unwarranted over the last two decades. If the proposed amendments go through as they are currently written, the industry's death will be accelerated.

Imagine the following scenario: You are an investor based in London and decide to take a patriotic risk and invest in a mining project in South Africa. After all, the ore body is rich, the infrastructure is relatively good by

continental standards, and there is plenty of deep mining knowledge in the country. Your immediate superior calls you in and asks why you decided to gamble investors' money on a country that has, since 2004, consistently signalled to the world that it values excessive ministerial discretion, will not commit to licensing transparency or competitive processing timeframes, and insists on ill-defined beneficiation and empowerment rules. You respond that it's complex, mining has a terrible history, hasn't treated local communities at all well on average, and was instrumental in fomenting extensive fractures in the social fabric. And the quality of the ore body is worth the potential value-destruction risk. What do you think your superior might say?

The truth is that it is complex. However, you cannot milk a cow that isn't producing milk. I ran the

The bill appears extractive rather than enabling. It doesn't seek co-investment or alignment with mining companies but views them as entities to be regulated and milked.



South Africa is very clearly in 'premature deindustrialisation'.

Amendment Bill through ChatGPT (try it; it's fun); this is what it said: "The bill appears extractive rather than enabling. It doesn't seek co-investment or alignment with mining companies but views them as entities to be regulated and milked." This is a rather forthright indictment. The answer to historical redress does not lie in producing legislation that deters the very investment the country requires to ignite the industry and generate wealth that can then be invested into other productive sectors to produce broad-based development.

Business Day reported (as I write) that mining is in a technical recession (4 June 2025). For two quarters in a row, the industry has contracted in terms of its contributions to the country's GDP. Heavy rain is predominantly responsible for the underperformance. While this might provide a plausible immediate explanation, the underlying dynamics are clear – productivity cannot grow without investment into exploration or production expansion capacity at existing mines.

There is now plenty of commentary about the specific elements of the bill that are problematic. I won't bore you with it here. But it is nonetheless astonishing to see that, despite twenty years' worth of incisive public commentary and stakeholder input that the country's mining law is not fit for purpose, a set of amendments is now on the table that look very much like they were extracted from 2013 amendments. In 2013, the 2008 amendments to the Mineral and Petroleum Resources Development Act (MPRDA, 2002) were eventually enacted. But this only after a new set of amendments to the 2008 Amendment Act had already been tabled. Those amendments were eventually scrapped because Jacob Zuma had been advised that they would not pass constitutional muster. By the end of 2015, the Bill was returned to parliament and lapsed. Everything we warned about in that Bill has essentially made a return in the form of the 2025 Bill.



If the proposed amendments to the mining legislation go through as they are currently written, the industry's death will be accelerated.



We need a new vision, a new narrative and a new deal for mining.

There are still no clear timeframes committed to for processing exploration and mining licence applications. There is a very poorly defined commitment to "beneficiation" through stating that mining companies will be required to hold back some (unspecified) quantity of production for local value addition. Aside from the likelihood that this will violate international trade law, it makes very little business sense at present and deters investment. Instead of throwing a wish list into legislation, perhaps it would be more sensible to connect a real Critical Minerals Strategy (one that actually has a workable business plan) to MPRDA Amendments.

The truth is that South Africa is very clearly in 'premature deindustrialisation' – manufacturing value addition and share of overall employment have been deteriorating since at least as far back as 1996. It's a major part of the reason why unemployment persists at 33%, and youth unemployment at nearly 50%. We do need legislation, informed by a visionary and practicable policy, that will help to re-ignite industrialisation. And the vision needs to be one that is focused on attracting exploration investment for minerals of the future (to feed a low-carbon future), and to add value to those minerals where economically feasible (assuming we fix infrastructure, energy and crime sharply). The very technologies that we feed our minerals into will also enable lower-cost and environmentally friendly mining.

For this to come to fruition, we need a new vision, a new narrative and a new deal for mining. Can we come up with a low-carbon orientated strategy that replicates something of the value of the Debswana deal that has served Botswana so well? Can we think beyond the trough of today that feeds politicians who think it's their turn to eat at the expense of tomorrow? Can we pursue a vision that repositions South Africa as a world class mining investment destination? ■

Advanced technologies enable water reuse

Utilities and businesses around the world have reused 18.1 billion cubic metres of water since 2019, enabled by solutions from global water technology leader Xylem, the company revealed in its Sustainability Report. That volume is enough to meet the annual water needs of more than 350 million people, based on global use estimates. Reuse is just one part of a broader effort to increase global water security – alongside the implementation of advanced treatment and digital technologies. Water managers are using the innovations to protect water sources, remove contaminants, reduce

emissions, and make water infrastructure more resilient. “Our customers are tackling the world’s toughest water challenges,” said Matthew Pine, Xylem CEO. “Their results show the impact of scaling proven technology solutions to strengthen water systems. The work they do empowers businesses and communities to become more water-secure.” In 2019, Xylem launched its 2025 Sustainability Goals, including several targeting the positive impact its technology enables for its customers. Xylem achieved all four of its 2025 Customer Sustainability Goals ahead of schedule. Building on that momentum,

the company has set a bold new target: enabling customers to reduce annual water demand by 2 billion cubic metres by 2030.

“Every drop we can reuse is a win for our communities,” said Chetan Mistry, Strategy and Marketing Manager at Xylem Africa. “We see success when we work closely with community members. We provide the materials and equipment, and experts who share their knowledge, but it’s the community who makes a difference. There are also gains for water recycling among local mining, agriculture, and the public utility sector.” ■

Pumps lead the way with advanced technology

In 2008, the KSB GIW® MDX pump represented a major leap forward in mill duty applications. The MDX was meticulously designed as a world-class mill pump for cyclone feed applications. Within five years of its launch, major mines began specifying the MDX pump for new facilities and expansions. The MDX has consistently outperformed other pumps, often two to four times in certain cases. As a result, many customers have standardised on the MDX for their cyclone feed applications praising it for its best-in-class wear performance and ease of maintenance. In 2018 the first RAMSL (Remotely Adjusted Mechanical Suction Liner) was installed, revolutionising

the adjustment of impeller nose clearance by enhancing wear performance and reducing maintenance time. This was followed by the installation of the first SLYsight in 2021, an advanced slurry pump wear monitoring technology that uses sensors to provide real-time data on pump wear, optimising maintenance schedules and extending pump life.

Looking ahead, KSB GIW is leveraging its world-class foundry capabilities to meet the market demand for larger mill duty pumps. The development of the MDX 850 will take full advantage of the expanded foundry’s capacity. Additionally, the new KSB IoT and Automation Lab in Grovetown, Georgia,



USA, will accelerate the development of digital products. Plans include a handheld version of SLYsight and a user dashboard for on-demand data to optimise equipment performance. These initiatives will introduce exciting new features to the market, ensuring the MDX product line remains ahead of the curve and continues to offer best-in-class performance. ■

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LH Marthinusen launches new industrial fan production facility in Ekurhuleni

LH Marthinusen, a Division of the ACTOM Group, launched its new industrial fan manufacturing and services factory in Ekurhuleni on the 29th of May. The event established a major milestone for South African energy infrastructure growth and was attended by representatives from government agencies, Eskom, and industry partners. The facility, which is a major investment by ACTOM, will expand over the following three years to fulfil Eskom contracts. The newly established factory not only manufactures industrial fans and their components but also offers maintenance services for essential fan systems that support Eskom's air pre-heater infrastructure. These fans are crucial for Eskom's power generation facilities, as they play a key role in managing airflow and regulating temperature levels. David Sullivan, Divisional CEO of LH Marthinusen, highlighted the strategic significance of this facility: "The launch of this facility underscores our dedication to fulfilling Eskom's infrastructure needs with local products and innovative solutions. Our fans play a pivotal role in the successful operation of Eskom's essential air pre-heater systems. This facility not only boosts our manufacturing capabilities but also fosters employment growth and industrial development in the region." While the project aims to create 50 new positions throughout the first three years, the company envisages an additional 120 job openings to meet Eskom's and general industries' infrastructure demands. ■



LHM from left to right: David Sullivan Divisional CEO of LH Marthinussen; Mpho Parks Tau, Minister of Trade, Industry and Competition; Mervyn Naidoo, CEO of ACTOM; Andries Mthethwa Chairman of ACTOM.



LH Marthinusen launches new industrial fan production facility in Ekurhuleni.

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Werner Pumps expands industrial jetting and vacuuming business

Repeat customers are a sign that you're doing something right, according to George Jolly, National Sales Manager at Werner Pumps, leading local manufacturer of high-pressure jetting and vacuuming equipment. "Beyond bringing us repeat business, these customers also become partners in helping us improve our offering and ensuring we meet all their needs," he says. One such customer for Werner Pumps is Bonginkosi Nyawo, CEO of AB Sambane – a company that offers specialised industrial vacuum cleaning services, high-pressure cleaning, spill response, and industrial drain cleaning and maintenance, among other things. "Since 2017, Bongi has bought four Werner Indlovu 12500I Liquid Ring Vacuum trucks and one Werner Impi 12500I Combi Vac Jet Truck," says Jolly. "These are being used at South 32 Hillside Aluminium in Richards Bay (the largest aluminium smelter in the southern



hemisphere) and Mozal in Mozambique. He also undertakes ad hoc work at Richards Bay Minerals. Nyawo adds that the units are being used for vacuum cleaning of bath and coke waste on conveyor systems, furnaces, pots and sumps in the smelter, and for spill response within the plant. "The vacuum trucks I purchased from

Werner Pumps are designed to handle the industrial waste streams at smelters," he says. "They are very durable and powerful, which makes the work easier and ensures reliability for my clients and I. The Werner Indlovu 12500I Vacuum Truck is a wet and dry vacuum unit. It allows me to vacuum a range of different waste streams with ease." ■

Beltcon 2025 scheduled for early August

Beltcon, a leading conveyor event in Africa, taking place from 6-7 August at Emperors Palace, has an impressive line-up of international and local speakers, including keynote speaker, Chris Wheeler, Professor at University of Newcastle, Australia, speaking on the topic 'Research Innovations', Andrew Jennings, President of Conveyor Dynamics, USA and Simon Curry, committee member of the South African Institute of Materials Handling. The conference is organised by a dedicated committee from the South African conveyor industry and is set to appeal to decision makers, designers, engineers, manufacturers and constructors in the sphere of belt conveying. Delegates are treated to an exclusive showcase of bulk materials handling equipment and services displayed by companies that are leaders in the industry. ■



Beltcon takes place from 6-7 August at Emperors Palace.

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- How can we manage the transition responsibly?
- What is Eskom's perspective on coal and what are its plans to transition to renewable energy sources?
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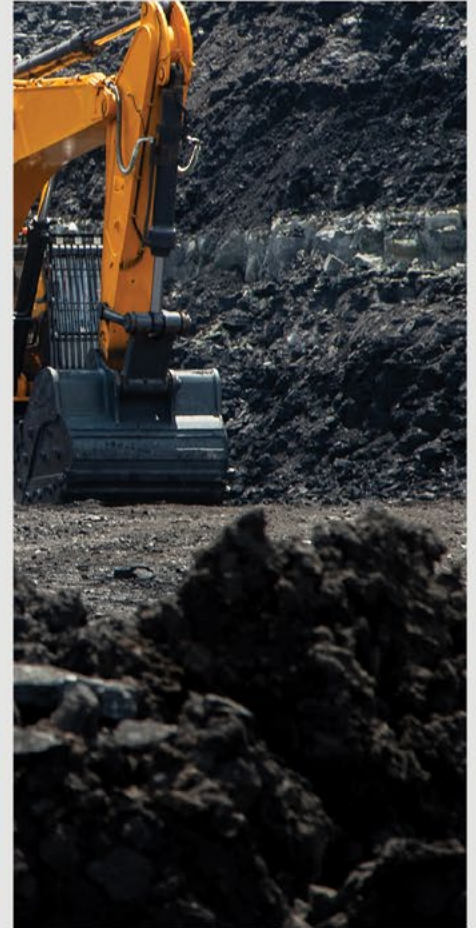


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