MODERN MINING

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IN THIS ISSUE

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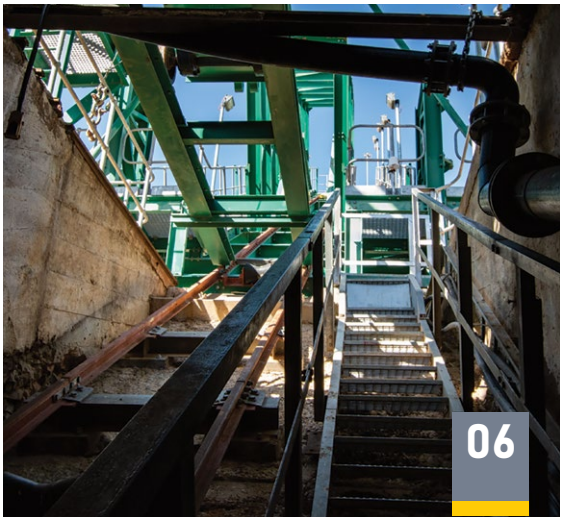
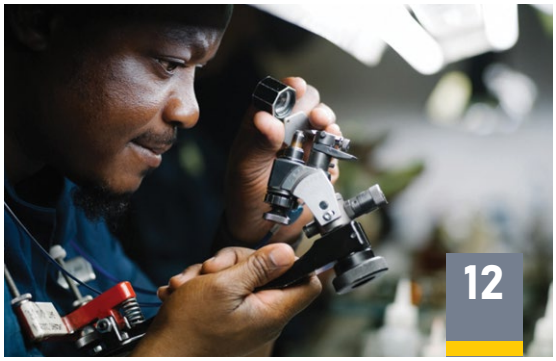
CONTENTS



ON THE COVER

Strengthening the junior and emerging miners sector is crucial to the nation's future.



COMMENT

Disrupting the global energy market

Two key events have recently taken place that disrupt the global energy market – one, the UAE officially left OPEC and the broader OPEC+ alliance, effective May 1, 2026, and two, a Chinese team has pioneered a path to turn carbon dioxide into jet fuel — a breakthrough arriving at a particularly opportune moment as jet fuel prices continue to surge.

The UAE ended nearly 60 years of membership to pursue independent production goals, as it seeks to maximise its oil production capacity (up from 3 million to 4.8 million barrels/day) without being constrained by OPEC+ production quotas. The UAE holds significant spare capacity, previously acting as a key swing producer in the Middle East.

Based on projected production rates, the UAE's oil reserves are expected to last for over 100 years. However, despite having substantial reserves, the UAE is pursuing a strategy beyond oil. Its diversification strategy aims for non-oil sectors to contribute over 70% of GDP by investing in technology, renewable energy, tourism, and manufacturing. Key strategies include developing AI, enhancing infrastructure, and fostering a knowledge-based economy through sovereign wealth funds.

Nelendhre Moodley.

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So, what is the impact of this unprecedented move on the global economy? Essentially, it weakens the OPEC's market control, impacts oil prices, and reflects a shift towards energy diversification amid geopolitical tensions. The move is likely to drive a more competitive, decentralised market with increased output. While this could offer relief to oil-importing economies, it reduces OPEC's, especially Saudi Arabia's, influence and introduces market volatility.

Secondly, a Chinese research team from the Shanghai Advanced Research Institute of the Chinese Academy of Sciences (CAS) has successfully pioneered an industrial pathway to convert carbon dioxide (CO_2) directly into high-value aviation fuel, shifting the technology from laboratory testing to large-scale production. China recently inaugurated two fully operational power generators that run on carbon dioxide.

Does this mean that, in the not-too distant future, we can kick the fossil fuel habit?

Although this pioneering Chinese technology is unlikely to disrupt the global oil market immediately, it is positioned to start changing the market within 3 to 10 years (2029–2036).

In this edition

The June edition of Modern Mining brings together a range of insightful features and industry perspectives shaping the future of mining and energy across Africa and beyond.

Among the highlights is a lithium market outlook by Tom Price of Panmure Liberum, titled Lithium – the Rise of Zimbabwe, which examines Zimbabwe's emergence as a major player in the global lithium market. In just five years, Zimbabwe has grown its domestic lithium production rate from zero to 240 ktpa (pg 8).

Diamond producer De Beers discusses streamlining diamond sorting and valuation at its Sky Park facility (pg 12), while financial services group Nedbank unpacks the key dynamics influencing the mining sector (pg 16).

> Based on projected production rates, the UAE's oil reserves are expected to last for over 100 years. However, despite having substantial reserves, the UAE is pursuing a strategy beyond oil.

On the energy front, Chinese multinational, Huawei Digital Power, speaks to Modern Mining about its significant investments in smart microgrid solutions (pg 20). In the Crushing & Screening feature, Sandvik Rock Processing Solutions discusses its engineered-to-order plants designed to optimise African crushing operations (pg 24), while Pilot Crushtec spotlights the Metso Lokotrack LT400J, engineered to enhance productivity and ease of use (pg -26-).

The Materials Handling feature includes LIBO Group outlining its growth strategy to expand its footprint across the African continent (pg 30) with Astec Industries highlighting its multifunctional machines that help to reduce costs and improve operational efficiency (pg 32).

Our Pumps and Valves feature highlights Integrated Pump Technology strengthening local readiness as extreme weather conditions continue to reshape dewatering strategies (pg 34) with ITT Goulds Pumps discussing the value of integrated pumps and mixers for mining operations (pg 36).

Also featured is a thought-provoking column by Jesper Jonsson of RSK Group, titled We must find ways to de-escalate conflicts and work with artisanal miners (pg 38).

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Driving efficiency and sustainability

Deon de Kock appointed to lead Babcock's operations in Africa

Effective January 2026, Deon de Kock has been appointed Chief Executive – Africa at Babcock. An accomplished global business leader with more than 30 years of executive experience across industries and continents, De Kock is tasked with providing strategic direction and operational focus to support the growth of the business across the region. De Kock takes over from Roger O'Callaghan after more than two decades of leading Babcock Africa, effective January 2026. De Kock brings a wealth of global executive experience across the mining, engineering, industrial and energy sectors. He has previously held senior roles in large organisations and major multinationals, including President for Sub-Saharan Africa, the Middle East and South Asia at FLSmidth, and Vice President for South Europe, North Africa and the Middle East at Sandvik. ■

Deon de Kock appointed Chief Executive – Africa at Babcock.

Investors commit over R105 billion to Northern Cape economic development

The Northern Cape province has announced that over R105 billion in pledges have been made by investors.

The Northern Cape province has announced that over R105 billion in pledges have been made by investors in new and expanded mining, energy and agriculture projects in the Northern Cape, with an expected 19 800 new jobs to be created as a result. The investment accords were signed at the inaugural Northern Cape Investment and Jobs Conference in Kimberley this week.

Northern Cape Premier Dr Zamani Saul said the new investor commitments took the province a long way toward achieving its target of growing the Northern Cape's GDP from R164 billion to R200 billion and creating at least 60 000 new and sustainable jobs by 2030.

The mining industry investments included:

- A R17 billion commitment by Vedanta Zinc International for expansion of its Gamsberg mine, which will make it the world's largest zinc mine, as well as for the development of a smelter in the province.
- An R11.2 billion commitment by Anglo American, which will include expansion of its Kumba Iron Ore operations in the province.
- A R2.8 billion investment by Northern Cape Protech & Agri Revolution in mining, beneficiation and agriculture.
- A R1.4 billion commitment by South32 for mining and beneficiation. ■

Cora Gold $120m financing to fund Sanankoro to production

Cora Gold, the West African focused gold company, has signed a binding term sheet for a US$120 million gold stream with Eagle Eye Asset Holdings to support development of the Sanankoro Gold Project in south Mali.

Highlights of 2025 Definitive Feasibility Study ($2 750/oz gold price)

- Low capital intensity – initial development CAPEX of US$124 million.
- Competitive opex – AISC of US$1,478/oz driven by low strip ratios, soft ore and simple processing.
- Compelling economics – post-tax NPV8 of US$221 million and post-tax IRR of 65%.
- Production – 64koz average annual gold production for the first five years.
- At US$3,250/oz gold price the post-tax NPV8 is US$319m, post-tax IRR of 88% and AISC of US$1,568/oz.

Bert Monro, Chief Executive Officer of Cora, commented, "Our September 2025 DFS, demonstrated the compelling economics of the Sanankoro Project, and we are now focused on advancing the Project into construction and ultimately delivering first gold. In parallel, we remain highly encouraged by the broader resource and greenfield upside across the project area and will continue to pursue a dual-track strategy of advancing development while systematically growing the resource base to support long-term production."

Cora Gold secures $120m to fund Sanankoro project development.

Andrada secures $11 million to accelerate growth

AIM-listed Andrada Mining, a tin producer with a portfolio of critical minerals mining and exploration assets in Namibia, has successfully completed a private placement with strategic investors. The company has raised $11 million (£8.1 million) before expenses through a placing of 226 337 448 shares in the company at a price of 3.6 pence per share. Anthony Viljoen, Chief Executive Officer, commented: "The completion of this placement with some key strategic investors, comes at a pivotal juncture for Andrada. The funding allows the company to scale up operations and advance various growth initiatives, whilst deriving maximum benefit from the high commodity price environment. Importantly, this fundraise completes the current equity financial requirements for the Group. This funding, along with current tin prices and production provides the pathway for the company to complete its expansion programme at Uis, with the exploration programmes at Lithium Ridge and Brandberg West already funded by strategic partners SQM and BWCAM."■

Andrada Mining has raised $11 million to accelerate growth.

Metallurgical breakthrough positions chrome as revenue driver

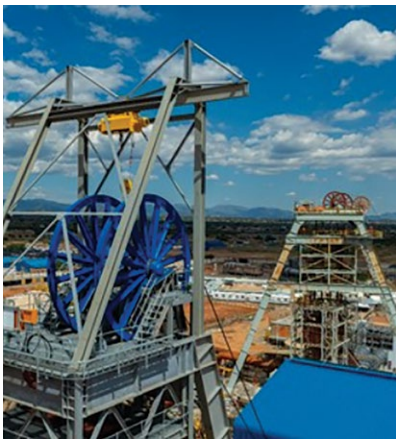
Results from metallurgical test work at the Bengwenyama Platinum Group Metals (PGM) project in South Africa's Limpopo Province indicate that up to a fifth of Southern Palladium's future revenues could come from chrome.

Southern Palladium continues to make strong progress at Bengwenyama, advancing Definitive Feasibility Study (DFS) workstreams and early mine development planning at the Bengwenyama PGM project. Located on the Eastern Limb of South Africa's Bushveld Complex, the Bengwenyama PGM project is one of the world's largest remaining undeveloped PGM resources. Southern Palladium reported that the results from its latest metallurgical test work not only confirm the high-grade nature of the Bengwenyama UG2 Mineral Resource but also suggest that chromite concentrate recoveries of more than double initial estimates are achievable. "Metallurgical test work has once again confirmed the grade and robust nature of the UG2 Mineral Resource, but the doubling of chrome recoveries is potentially company-changing; it elevates chrome from a by-product to a parallel output," said Southern Palladium CEO Johan Odendaal.

On a 3E basis, the metallurgical sample indicates an average combined platinum, palladium and gold grade of 7.35 g/t and a prill split of 49.9% platinum, 48.6% palladium and 1.5% gold with a Cr_2O_3 grade of 29.71%.■

Up to a fifth of Southern Palladium's future revenues could come from chrome.

Platreef metals basket price exceeds $2 000 per ounce



TSX-listed Ivanhoe Mines Executive Co-Chair Robert Friedland and Chief Executive Officer, Marna Cloete, have announced that a project ceremony was held at the Platreef Mine, in Limpopo Province, South Africa, marking the achievement of three major development milestones.

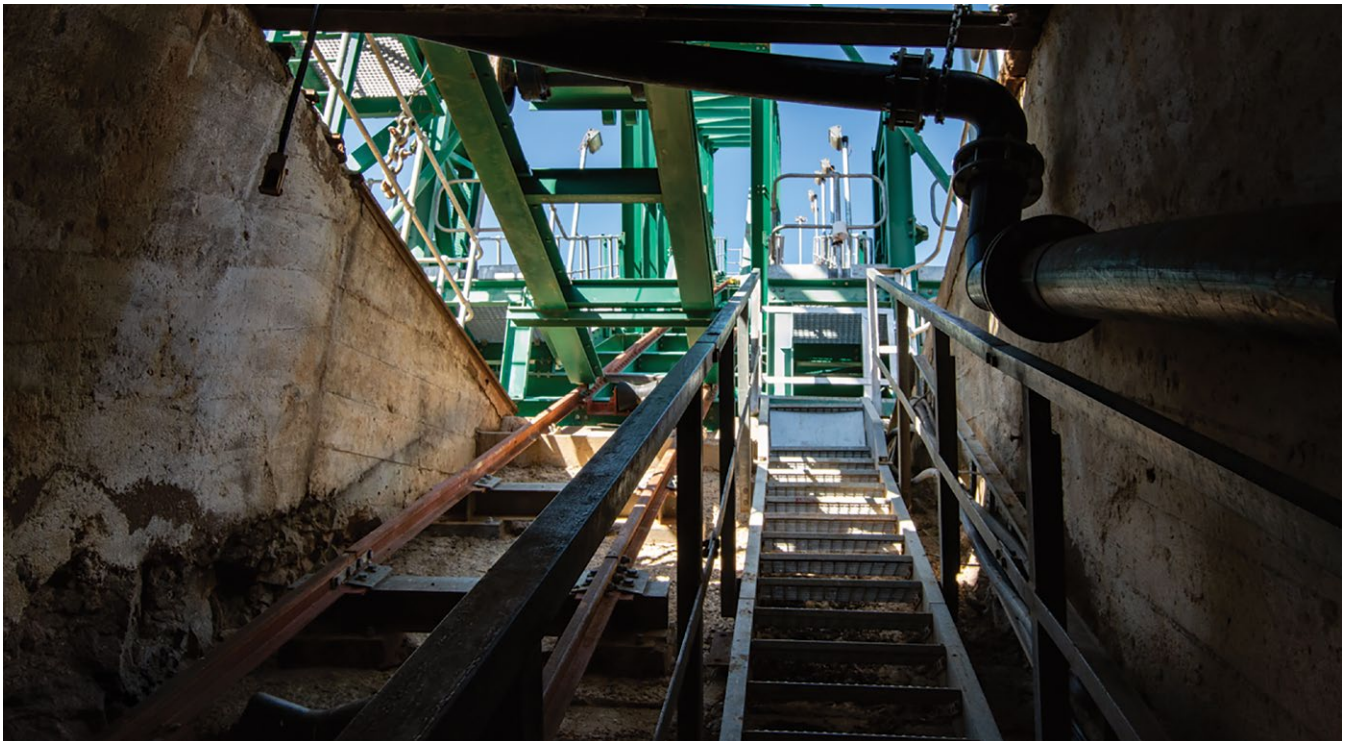
The milestones include the completion of construction of the 4-million-tonne-per-annum (Mtpa) Shaft #3; the breaking of ground for the Phase 2 concentrator site; and the commencement of widening of Shaft #2. The project milestones are a major advancement for the Phase 2 expansion and the future Phase 3 expansion.

The on-site ceremony was attended by Ivanhoe Mines' CEO Marna Cloete, senior management from Ivanhoe Mines and Ivanplats, as well as representatives from Ivanplats' shareholders Japan Organisation for Metals and Energy Security (JOGMEC), ITOCHU Corporation and the broad-based black equity empowerment (B-BBEE) group.

Ivanhoe Mines Founder and Co-Chairman Robert Friedland commented: "We are ramping up the mine at a time when metal prices are rising. Scarcity is real and the demand is relentless. Platinum, palladium, rhodium, copper and nickel are identified by countries all around the globe as critical minerals and therefore strategic to agenda of many of the world's developed and developing economies." ■

Steenkampskraal Monazite Mine turns soil on new processing plant

Steenkampskraal Monazite Mine (SMM) recently held a ceremonial soil-turning event to mark the official start of construction on its new monazite processing plant. The milestone advances the mine's phased development plan and positions South Africa to become a producer of high-grade monazite concentrate, a critical feedstock for rare earth elements essential to renewable energy, electronics, medical and defense technologies amongst numerous others.



The announcement builds on recent operational achievements at the site. SMM has successfully commissioned its on-site laboratory and, for the first time in more than 60 years, produced monazite concentrate from its metallurgical circuit.

"The initial product has demonstrated approximately 50% total rare earth oxide (TREO) content, confirming the high-grade nature of the deposit. In parallel, the mine's hydrometallurgical laboratory circuit is currently undergoing optimisation. Early results have been encouraging, with production of mixed rare earth carbonate (MREC) and cracked thorium anticipated in the near term," said Graham Soden, CEO of SMM.

The monazite processing plant facility, located close to the existing underground decline shaft exit, will receive monazite-rich ore directly via a purpose-built conveyor belt system. Ore will be transported from underground workings to the surface plant for initial concentration using a proven gravity separation and flotation technology.

The monazite processing plant has been designed to achieve an annual steady-state output of approximately 13 400 tonnes per annum of monazite concentrate containing more than 50% total rare earth oxides (TREO). During the initial ramp-up period, production will start at around 6 600 tonnes per annum,

increasing to full capacity towards the end of the first year, Soden said.

"This phase will use proven gravity separation and flotation technology, optimised through modern refinements and pilot testing by the Saskatchewan Research Council and Mintek. The process flow draws on the successful methods used during Anglo American's historic operations at Steenkampskraal between 1952 and 1963. It has been adapted for modern environmental standards and incorporates a multi-gravity separation circuit, currently under evaluation for enhanced recovery efficiency.

"The processing plant will receive feedstock from both historic surface stockpiles and underground ore, minimising initial capital expenditure and operational risk. This approach provides early revenue generation while refurbishment of underground infrastructure continues in parallel. The design also includes a front-end comminution and milling circuit, ensuring consistent feed quality to the concentrator and allowing for optimal grade control.

"Phase 1 forms the foundation for subsequent processing stages, including hydrometallurgical treatment, oxide separation and product manufacturing, all of which will be undertaken within South Africa to maximise local beneficiation and value retention," Soden said.

SMM Executive Chairperson Prof Enock Mathebula added: "This phase represents the practical realisation of our strategy to re-establish Steenkampskraal as a globally significant source of rare earth materials.

"We are leveraging proven metallurgical processes, supported by modern technology and strong compliance standards, to ensure a sustainable and efficient operation that benefits both the national economy and local communities.

"The soil-turning event is more than a construction milestone, it is the foundation of Steenkampskraal's commercial future. By establishing dedicated ore transport and processing infrastructure, we are creating South Africa's first dedicated monazite concentration facility. This concentrate represents our initial revenue-generating product and will serve as feedstock for subsequent value-adding stages, including mixed rare earth carbonate and thorium production.

"The soil-turning demonstrates our commitment to rapid, responsible development. With funding secured and construction now underway, we are on track to establish a revenue-generating process before the end of 2026. This will not only generate early cash flow but also create jobs, support local communities and contribute to South Africa's critical minerals strategy. Offtake discussions for the concentrate are already advanced with international partners.

"The Steenkampskraal deposit is recognised as one of the highest-grade rare earth and thorium resources globally, with a NI 43-101 compliant current resource of 665,000 tonnes at 14.5% TREO and significant co-products including thorium (2.14%). The spade-ready project benefits from fully developed underground and surface infrastructure, full regulatory licensing and an experienced mining partner, Bora Mining Investments (BMI)," Prof Mathebula added.

"SMM remains committed to sustainable practices, including environmental rehabilitation, community skills development and compliance with all nuclear and environmental regulations," he concluded. ■


MONAZITE CORE

Steenkampskraal Monazite Mine (SMM)

Steenkampskraal Monazite Mine, located in the Western Cape, is a spade-ready rare earth and thorium project owned by Steenkampskraal Holdings in partnership with Bora Mining Investments.

With one of the world's highest-grade monazite deposits, SMM is advancing a phased development plan to produce monazite concentrate, mixed rare earth carbonates, thorium, and ultimately separated rare earth oxides.

The project is fully permitted and poised to play a strategic role in global critical minerals supply chains.

Lithium – the rise of Zimbabwe

By Tom Price Managing Director, Research Analyst, Resources at Panmure Liberum

The long-standing dominance of Chile and Australia – as the collective source of global lithium supply, used mainly in rechargeable batteries, including those of electric vehicles (EVs) – is being challenged by Zimbabwe. In just five years, Zimbabwe has grown its domestic lithium production rate from zero to 240ktpa, now almost 20% of global lithium supply.

Lithium supply is used mainly in rechargeable batteries, including those of electric vehicles.

Key producers & projects

Key local lithium operations include 90ktpa Bikita (bought 2022, China-owned Sinomine); 50ktpa Arcadia (Zhejiang Huayou Cobalt); 25ktpa Sabi Star Mine (Chengxin Lithium); 10ktpa Zvishavane (Zheli Lithium).

Key projects include >30ktpa Sandawana (state-owned Kuvimba Mining House; possibly from 2027) and >12ktpa Zulu lithium-tantalum (Premier African Minerals).

Resource nationalism

Note, most lithium assets of Zimbabwe are Chinese-owned. Only the artisanal miners manage the country's modest residual lithium-producing capability. For almost a decade, China's various entities have been developing Zimbabwe's lithium resources, to send the output home for refinement and use, mainly in its ballooning rechargeable batteries industry.

To mitigate this loss of control over local mineral resources, the government of Zimbabwe banned the export of lithium ore in 2022. In January this year, the government decided to tighten lithium exports further, with a ban on lithium concentrate exports (carbonate, hydroxide, etc.) too.

The objective of this ban is probably the same as Indonesia's 2009 Mining Law, another country dealing with China's relentless development of local mineral resources.

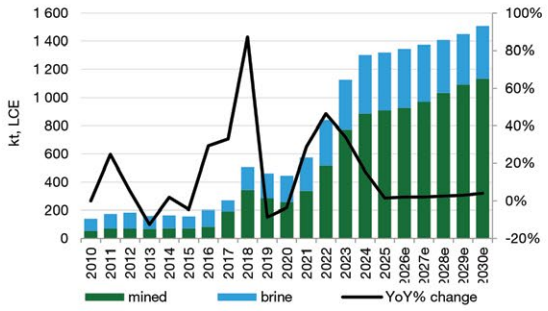
Restricting the export of unprocessed minerals effectively forces foreign players to invest in local processing and upgrading capacity – if they wish to continue receiving supply. This investment, in turn, allows the local economy to capture more of the commodity's 'value-in-use' – the future cash flows arising from its production and trade. More generally, investment in the local industrial base creates local employment, boosts the local capital flow, etc.

The policy has been spectacularly successful in developing Indonesia's mining industry over the last 10-15 years – which has made it the world's producer and exporter of thermal coal and nickel. Zimbabwe's government is determined to achieve a similar outcome, starting with its China-dominated lithium mining industry.

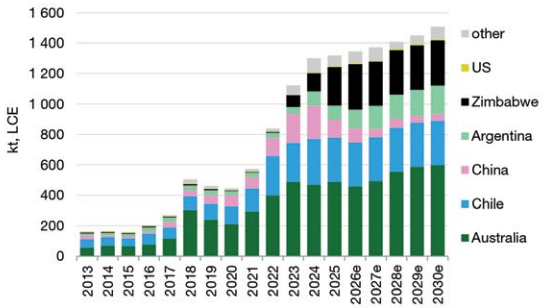
Price action, explained

What price is paid, for Zimbabwe's lithium exports? Over three-quarters of the global 1.3Mtpa lithium market is based on contract pricing (6-12 month-basis). These, in turn, are based on daily-reported prices, established by a China-centred spot trade. And over the last couple of quarters, spot prices of lithium's key products – carbonate/hydroxide – doubled within 4Q25 to above US$20k/t, to trade in a US$20-25k/t-range year-to-date. Spot terms are a reasonable guide to the prices received for Zimbabwe's lithium exports.

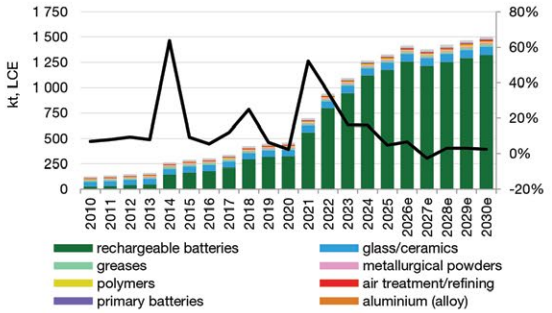
Lithium mine supply (ktpa)



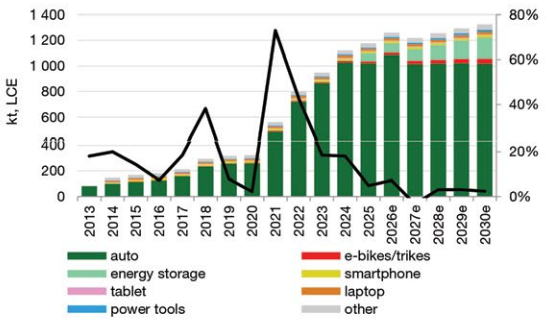
Lithium global mine supply, by country (ktpa)



Lithium's key end-uses (ktpa)



Lithium's rechargeable battery demand (ktpa)



3 x price rally drivers

1. Mine supply cuts: We regard mine output curbs of 2023-24 as critical in creating the conditions for lithium's 4Q25 price rally: >200ktpa of supply was cut, 12-15% of the global total. These occurred mostly in Australia, Chile, China – partly displaced by lower cost supply in Zimbabwe. This structural shift saw both the industry's capex cycle and total supply growth stall in 2025 (i.e. flat year-on-year, at 1,301kt).
2. Demand recovery/stability: While global lithium demand also slowed in 2025 (+3%YoY to 1,288kt vs. >>10%/yr, 2021-24), it was sufficient to offset supply by 2H25, buoying product prices by 4Q25, into 2026.
3. Stocking strategies: While there are no reported market inventories for lithium - like other base metals, steel, iron ore, coals, etc.) – we do track the monthly difference between supply and demand as a general proxy. Our analysis suggests that government-prompted strategic stockpiling is in play, acting as a quasi-demand driver.

Lithium's supply-demand outlook

For 2026, we forecast a 2%YoY lift in global mine supply, to 1,346kt (420kt, brines; 926kt, hard-rock), well below the 15-45%/year growth rates of global lithium miners' attempts to meet outsized demand growth in EV and energy storage during 2020-23. Note, the centre of global mine supply has shifted marginally in recent years – as the industry adjusted to 2023's price collapse – from Australia-Chile-China to Zimbabwe-Argentina.

Global lithium demand for 2026 is set to lift 4%YoY to 1,375kt. Of this total, EV demand is 1,083kt (79% of total Li demand), up 6%YoY; total rechargeable battery demand growth (incl. EVs) is forecast to lift 7%YoY to 1,259kt. Energy storage, lithium's new demand driver, is set to lift 20%YoY to 73kt. Other lithium end-uses include consumer goods' batteries, glass, ceramics, greases, polymers, etc.

About electric vehicles

Again, EV batteries demand dominated lithium's demand outlook. Here, we focus on the latest EV sales data for guidance on risks to total lithium demand growth. Global EV sales for 1Q26 of 4.0m is flat year-on-year – including China's 20%YoY fall to 1.9m (hit by new sales tax), EU's +27%YoY to 1.2m, North America's +27%YoY to 0.32m, RoW's +76% to 0.6m. Of global EV sales, 65% BEVs vs. 35% PHEVs.

For global 2026 global EV sales, we forecast 22.5 million EV passenger vehicle sales (+9%YoY), contributing 65% to all 2026 EV sales of 34.7 million (+6%YoY; incl. BEV, PHEV, FCEV; cars, buses, trucks, vans). In turn, total EV sales are set to represent 36% of 2026's total global vehicle sales (95.7m, +0.2%YoY).

Price outlook

Our modelling of lithium's short-term supply-demand condition flags a 30kt deficit for this year – making us lithium price bulls for 2026. Specifically, we expect the prices to at least hold above the US$20k/t (carbonate/hydroxide).

But we are not long-term lithium price bulls. Our long-term lithium price forecast, active from 2030, is just $16k/t (2025$; for carbonate/hydroxide). Why do we expect prices to eventually fall from spot levels? Because spot prices are far above the industry's current marginal cost of production of US$10k/t. We should therefore expect a lift in the global lithium supply rate – as miners worldwide exploit the industry's current, substantial economic rent. Eventually, this supply-side response will drag on lithium's medium-term prices, assuming its corresponding demand growth rate remains broadly intact.

Of course, this supply-side response to high lithium prices is already happening – in Zimbabwe. China is struggling to grow low-cost lithium supply at home, and in its two key sources of imports – Chile and Australia. China's massive-scale investment in the lithium industry of Zimbabwe since 2020 – the world's newest lithium mining province – reflects its determination to bring down the cost of this critical battery input. ■

Heavy road haulage continues to absorb mineral volumes where logistics constraints limit smoother movement by rail.

Ngqura exposes South Africa's 10 mt shift from raid to road

About 10 million tonnes of South Africa's manganese exports still moved by road in 2025, even as the country shipped a record 26.2 million tonnes of the ore. EBC Financial Group (EBC) highlights that mismatch is the reason the planned 16-million-metric-tonne Ngqura manganese terminal in the Eastern Cape is more than a port project. For a country that holds about 70% of global manganese resources, moving close to two-fifths of exports by truck suggests the binding constraint is no longer ore demand. It is the freight system needed to move ore from inland mines to ships at scale.

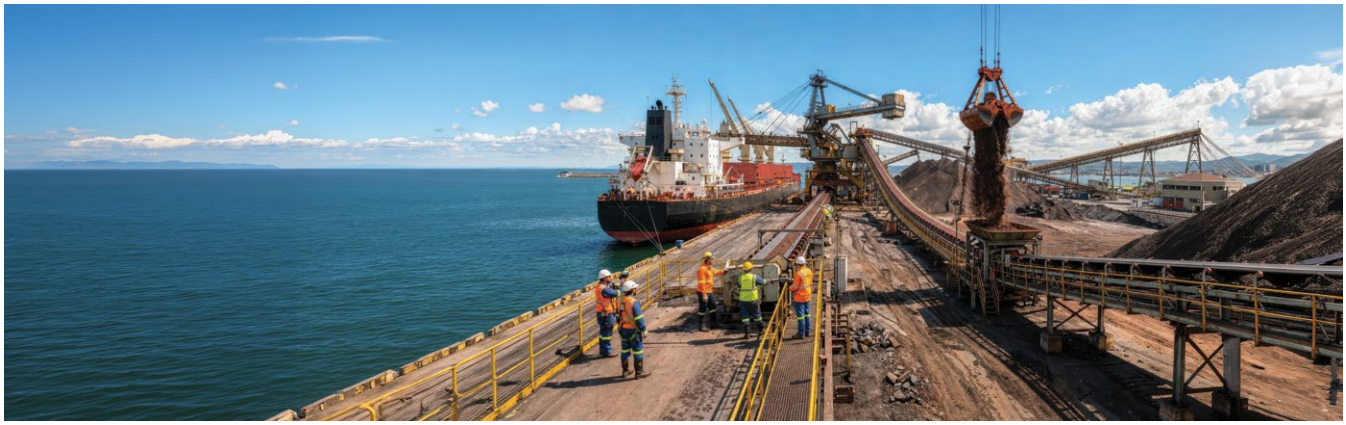
David Precious, Senior Markets Analyst, EBC Financial Group.

Ngqura's planned capacity equals about 61% of South Africa's manganese exports last year. That scale is large enough to change how a meaningful share of ore reaches export markets. EBC notes that the terminal raises export capacity only if more ore reaches the berth by rail. A port facility can load cargo, but it cannot solve an inland bottleneck on its own.

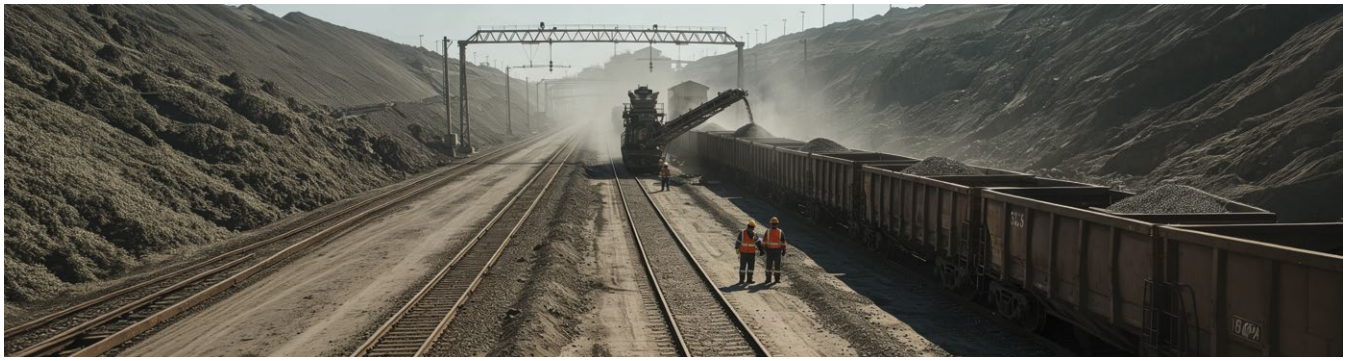
David Precious, Senior Markets Analyst at EBC Financial Group, said, "South Africa's constraint is no longer ore availability or export demand. It is the cost and reliability of moving bulk minerals from mine to port. When a country ships record manganese volumes yet still sends about 10 million tonnes to the coast by road, that points to a freight system that is absorbing demand rather than scaling with it."

Coal and iron ore already show the cost of weaker logistics

Coal exports from Richards Bay Coal Terminal rose 11% to 57.66 million metric tonnes in 2025, the highest level in four years, as rail performance improved. That was still far below the 76 million tonnes exported in 2017. This comparison shows that better rail performance can lift export volumes, but South Africa is still operating well below the capacity it once moved through the system. Kumba Iron Ore reported that rail performance improved to 84% of contracted volumes in 2025, helping raise sales and reduce on-mine stockpiles to 5.7 million tonnes from 6.9 million tonnes a year earlier. That means more ore were moved out of storage and into the export chain as logistics improved. The reverse has also been expensive as Transnet's



Bulk export handling at port level illustrates how terminal operations shape mineral flow from mine to ship.



Freight rail capacity remains a critical part of easing logistics bottlenecks across South Africa's mineral export chain.

underperformance has already cut into coal and iron ore exports, cost mineral exporters billions of rand in lost revenue, and forced some producers to curb output.

Mining contributed 5.8% of South Africa's nominal gross domestic product (GDP) in 2025, equal to about R439.2 billion. Mineral ores and related products accounted for about 52% of merchandise export value, while mining contributed more than R100 billion to the national fiscus through taxes, royalties and value-added tax (VAT). Those figures explain why freight underperformance is not only a mining-sector problem. It affects export receipts, tax revenue, and the reliability with which cargo reaches overseas buyers.

> Mineral ores and related products accounted for about 52% of merchandise export value, while mining contributed more than R100 billion to the national fiscus through taxes, royalties and value-added tax (VAT).

Rail reform has started: The transport mix is the next scorecard

Eleven private train operators have advanced to the next stage across 41 routes and six corridors on South Africa's state-owned freight rail network. The government expects those operators to add 20 million tonnes of freight capacity a year from the 2026/27 financial year and support a national target of moving 250 million tonnes a year by rail by 2029. EBC says that reform matters because it is meant to increase train movements on existing lines, not simply add another policy commitment to a system still rebuilding lost capacity.

Chrome shows why the transport mix is the right measure to watch, with industry data indicating chrome ore exports reached 23.4 million tonnes in 2025, and about 9 million tonnes moved by truck. That is equivalent to more than 826 trucks a day and carries a cost premium of about 40% compared with rail. The analytical point is straightforward. South Africa is still moving export volume, but too much of that volume is using a higher-cost road route because rail capacity has not been sufficient. The same imbalance is now visible in manganese.

Transnet plans to invest ZAR 127 billion over five years to modernise rail lines and upgrade ports, after allocating R24 billion to infrastructure in the previous financial year and budgeting R25 billion for the current year. EBC sees that programme as a practical scorecard rather than a backdrop detail. The most useful signs of progress are concrete: higher rail freight volumes, stronger port throughput, and a lower share of manganese ore moving by truck. Those are the numbers that would show whether South Africa is improving the full export route from mine to vessel rather than adding capacity at only one point along it.

"Ngqura only becomes economically meaningful if it changes the transport mix" Precious added. "If rail access reform, port upgrades, and capital spending start lifting freight volumes and reducing truck haulage, South Africa can convert mineral strength into export earnings more efficiently. If that shift does not happen, the country risks adding terminal capacity at the coast whilst the inland bottleneck continues to cap volumes and raise costs." ■

De Beers Sky Park streamlines diamond sorting, valuation

Since its opening in March 2023, the Sky Park facility of De Beers Sightholder Sales South Africa (DBSSSA) has honed the efficiency, safety and sustainability of its rough diamond Sorting, Valuation and Sales.

An employee analysing large rough diamonds with a microscope and other technology in GSS, Gaborone, Botswana.

Blanche Louw, Senior Operations Manager at De Beers Sightholder Sales South Africa.

Located conveniently close to OR Tambo international airport east of Johannesburg, the facility serves as the central processing hub for De Beers' South African rough diamond production and the sales office for supplying rough diamonds to South Africa-based diamond cutting and polishing customers. The operations combine proprietary technology, specialist expertise and rigorous controls to move rough diamonds securely from production through to global markets.

According to Blanche Louw, Senior Operations Manager at DBSSSA, the building's design is underpinned by a clear production logic. This allows each stage of the diamond's journey to take place in a controlled, access-restricted environment – with reconciliation checkpoints built into every part of the process. Louw is responsible for overseeing the entire path of diamonds through the facility.

"Our operation is meticulously sequenced – moving diamonds through the cleaning zones and immediately into valuation and technical sorting areas," she says. "The layout of the building is specifically designed to bring optimal efficiencies into our processes."

Activities at Sky Park assess the four key elements of a diamond's value: carat weight reflecting the mass or size of the diamond; clarity from the presence or absence of internal inclusions and external blemishes; the colour of the diamond; and the cut which assesses the cutting opportunities presented by the diamond's shape.

Diamonds arrive at Sky Park under controlled custody, typically still carrying residue from the mining process, and are weighed and registered. The first stop is the Central Cleaning Plant (CCP) where diamonds are prepared to meet stringent standards for valuation and export. Louw notes De Beers has focused on minimising safety risks while maintaining effectiveness in its diamond cleaning activities.

A guest admires sparkling diamonds on display at Sky Park.

Safety with sustainability

"With our sharp focus on health and safety we have sought and succeeded in finding alternative cleaning methods to the hydrofluoric acid approach that has traditionally been used, enabling us to deliver another significant step forward," she says.

Developing the new approach required multiple trial iterations to achieve the cleaning standard required by the specific mineralogy of South African production. This cleaning innovation has drawn considerable interest, with teams from other De Beers operations also looking at this pioneering breakthrough.

Another advance has been a concerted move towards renewable energy – enhancing the facility's sustainability credentials and reducing energy costs. A 360-kilowatt solar system became fully operational last year, comprising more than 1,200 solar panels and 575 kilowatt-hours of battery storage. This contributes to the facility's five-star Green Star building rating.

Assessing value

Once diamonds have been cleaned, their carat weight is measured through one of two processing streams, either through sieving or sizing or a combination of both using proprietary technology to support efficiency.

De Beers combines a wealth of human expertise and leading proprietary sorting technologies to deliver an effective diamond valuation process.

Sky Park's Technical Sorting ('Techsort') area sees automated sorting complement experienced sorting experts to support a fast, repeatable and objective assessment for the smaller diamonds, which tend to be higher in volume but lower in value. Meanwhile, hand sorting by human experts remains essential for nuanced decisions on shape, clarity and colour for the larger diamonds, which tend to be lower volume but higher value products. Sky Park was intentionally designed to enable this combination of hand and machine sorting areas, supporting an optimised workflow.

Demonstrating the attention to detail, De Beers' diamond valuation processes see diamonds end up being sorted into one of more than 10 000 categories, each with its own accompanying value in De Beers' global pricebook. De Beers' combination of human and automated expertise accordingly delivers reliable and consistent pricing of each diamond parcel that is presented for sale.

Consistency

An important defining feature of De Beers' Sightholder sales model is consistency. This underpins the 'Intention to Offer' arrangement under which customers are offered specific categories of diamonds that reflect their business needs at regular sales events.

To support scale and consistency with diamond supply, which is by its nature unpredictable in terms of the variety of diamond types that come out of a mine, De Beers uses a process called 'aggregation' - blending together "likeforlike" categories of diamonds - to smooth out variability in production from different mines. This, in turn, enables the business to create consistent 'boxes', with each one designed to reflect customers' specific manufacturing requirements or downstream market needs.

These boxes of rough diamonds are presented to customers at the ten 'Sight' sales events that De Beers holds each year, with South African customers viewing their allocated diamonds at the Sky Park facility itself in dedicated viewing rooms on the premises.

Traceability, security

Provenance has become an increasing area of focus in the diamond industry, as retailers and end-consumers alike seek transparency about a diamond's source and journey to market. Sky Park has built traceability into the heart of its operation. All rough diamonds of one carat and above are scanned on arrival, creating a unique digital record of each diamond's shape and characteristics - very much like a unique fingerprint. At point of sale, each diamond is rescanned and the system cross-references the rescan against the intake record to confirm origin.

The digital records are captured on the blockchain-backed diamond traceability platform, Tracr, developed by De Beers to enable a diamond's provenance to be shared downstream. The Tracr platform continues to scale at pace with more than five million rough diamonds having now been registered.

Finally, Skypark hosts a Diamond Academy that ensures all employees follow a structured development pathway as they progress through the various levels of the production pipeline. This academy provides a strong foundation for employees to grow within their areas of expertise, supported by a range of internal programmes designed to build futureready skills.

The Academy also runs a 12 month learnership programme targeting young people from communities close to operations and combines seven months of classroom-based diamond sorting and industry education with five months of on-the-floor learning.

Louw concludes De Beers' groupwide strategy is to increase female representation across technical and leadership roles through recruitment, apprenticeships, bursaries, leadership and mentorship programmes plus inclusive infrastructure (gendersensitive PPE and upgraded facilities as well as flexible work). ■

Record gold prices continue to shift demand dynamics

Louise Street, Senior Markets Analyst from the World Gold Council.

The World Gold Council's Q1 2026 Gold Demand Trends report reveals that total quarterly gold demand (including OTC) reached 1 231 t, a 2% increase year-on-year. While volumes increased modestly, the value of demand surged to a record US$193 bn, up 74% year-on-year.

The World Gold Council's Q1 2026 Gold Demand Trends report reveals that total quarterly gold demand (including OTC) reached 1 231 t, a 2% increase year-on-year. While volumes increased modestly, the value of demand surged to a record US$193 bn, up 74% year-on-year.

Around the world, retail investors were drawn to gold's price momentum and safe-haven appeal, driving bar and coin demand up 42% year-on-year to 474 t. Demand in China surged 67% year-on-year to a record 207 t, considerably higher than the previous quarterly record of 155t in Q2'13. Other Eastern markets, including India, South Korea and Japan, also saw an increase in bar and coin buying, contributing to the ongoing structural shift in gold demand. Bar and coin demand was also supported by strong growth in the US and Europe, up 14% and 50% respectively.

Physically-backed gold ETF demand remained positive in Q1: holdings increased by 62 t, largely supported by continued strength across Asian-listed funds, which added 84 t over the quarter. Sizeable outflows in March, mostly from US listed funds, tempered what had been a very strong start to the year.

In contrast, jewellery demand declined sharply, falling 23% year-on-year to 300 t in reaction to the higher prices seen throughout the quarter. Demand weakened across all major markets, with notable declines in China (-32%), India (-19%) and the Middle East (-23%). However, in value terms, jewellery demand increased, indicating continued consumer willingness to spend on gold despite record prices. Market analysis suggests that some jewellery consumption has moved into bar and coin demand, particularly in markets like China and India where jewellery can act as a proxy investment.

Central banks continued to support overall demand, adding 244 t to global reserves in the first quarter. Purchases exceeded both the previous quarter and the five-year average despite an uptick in selling by a small number of official sector institutions including the Central Bank of the Republic of Türkiye, the Central Bank of the Russian Federation and The State Oil Fund of the Republic of Azerbaijan. Market activity throughout the quarter underscored gold's unique role as indispensable reserve asset, accessible during times of extreme market turbulence.

Total gold supply increased by 2% year-on-year to 1 231 t. Mine production reached a new first-quarter record, while recycling increased modestly by 5% despite elevated prices, suggesting a relatively muted supply response and tighter overall market conditions.

Louise Street, Senior Markets Analyst from the World Gold Council, commented:

"Gold's volatility has markedly increased in 2026, with prices peaking above US$5 400 /oz in January before a significant but contained correction. The combination of price momentum and heightened geopolitical risk propelled investment demand, most notably in Asia, as investors sought security in physical gold. Alongside this, continued central bank buying offset tactical selling.

"Looking ahead, the geopolitical risk premium should continue to support investment demand, though higher-for-longer interest rates may present headwinds, especially in Western markets. Jewellery spending is expected to remain resilient even as high prices weigh on volumes. On the supply side, mine production is expected to grow modestly, although potential energy shortages could temper that outlook." ■

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Gold has breached the US$5 300 /oz level but has retracted marginally lower.

Nedbank unpacks dynamics influencing the mining sector

2026 is being defined by intense geopolitical tensions, while the mining industry is simultaneously navigating a "polycrisis" of operational complexity and surging demand for critical minerals. To unpack these dynamics, *Modern Mining* spoke with Nivaash Singh, Head of Mining & Critical Minerals, in a Q&A exploring investment appetite, project bankability and how lenders are assessing South African mining risk.

Nivaash Singh, Head of Mining & Critical Minerals at Nedbank.

What are the key global factors influencing mining and metals globally and on the African continent?

- The energy transition and demand for critical minerals has ratcheted up a few gears. We are comfortably at a point of no return.
- Geopolitics and resource nationalism – western countries are trying to displace China's hold over African critical minerals.
- ESG & sustainability – developiong a social license to operate will determine which operators will be successful.
- Infrastructure, energy and operating cost structures – will impact the successful exploitation of bulk commodities.
- Availability of capital and the commodity cycle – timing is everything as the investment cycle should ideally precede the commodity super cycle.

What does Nedbank see as key themes in 2026? How can industry prepare and take advantage of the positive aspects while mitigating the challenges?

Nedbank sees the following key themes in 2026:

- Rising geopolitical risk.
- Social license to operate.
- Higher commodity prices likely to drive up operating costs.
- Understanding the capital stack when raising finance for mine development.
- The dangers of M&A activity during a commodity bull market.

Miners should always plan, engage early with host governments, and build trust with local communities to develop a healthy social license to operate and to achieve long term success. Maintaining adequate cost control especially in a commodity bull market will ensure long term sustainability and

spending capital prudently and avoiding unnecessary M&A during a commodity super cycle will ensure success.

How are these factors influencing investment appetite and how are investors and miners aligning?
Investors and miners are almost always misaligned. Investors who do not understand mining should not invest in mining stocks. Short-term investors should stick to tech stocks and other industries where short-term gains may be easily monetised.

Mining investors must be prepared to take a long-term view on their stocks and develop a longer-term view on the sector. If investors approach mining investments with these lenses, it will enhance alignment with the sector.

Is the push from BRICS countries to trade in their own currencies in any way influencing mining trade deals yet?
Mining companies trade in a global benchmark industry producing commodities that attract a USD price. Unless there are captive arrangements or vertically integrated operations whereby commodities are being produced and sold to a BRICS country under a bilateral arrangement, most miners will deliver into a global market earning hard currency revenues.

Which countries in Africa are garnering the most FDI for mining projects? How are lenders reading South African mining risk.
- Cote d'Ivoire
- Tanzania
- Zambia
- Botswana
- Namibia
- DRC

Each country above has a unique mining investment attractiveness. We are seeing a steady rise in capital flows into these jurisdictions for gold, copper, cobalt, uranium and rare earth minerals.

South African mining risk remains low but given unclear regulatory frameworks, a lack of a mining cadastre and poor turnaround times by the mining regulator has severely dented capital flows into SA which has resulted in a drying up of mining exploration activity for the next commodity super cycle.

Are you able to share insight into where South Africa stands as a country in attracting foreign investment for local mining projects?
South Africa is not attracting its fair share of FDI for mining projects as much as it should. Mining project developers find it incredibly challenging to work with poor regulations, unclear investment frameworks, a lack of transparency and long response times from the regulator. These factors frustrate project developers to the extent that they migrate into neighbouring states such as Botswana, Namibia, Zambia and the DRC in search for exploration permits.

Junior miners continue to face challenges in attracting project investment. Are there any innovative ways to access funding that have become available?
There is no mining project in the world, junior or not, that will struggle to attract capital for development, only a lack of readiness and preparedness by the project promotor when accessing capital markets. Nedbank has been actively promoting the concept of including funding plans into feasibility studies. Often, we find studies being released without an adequate funding plan. This creates a perception of being poorly prepared and approaching investors for capital without a plan.

Which commodities does Nedbank see garnering the most funding – why is this?
Copper, gold, PGMs, rare earth minerals, cobalt, iron ore, uranium. The energy transition is fuelling the demand for critical minerals while gold provides a safe-haven investment option. Gold has breached the US$5 300 /oz level but has retracted marginally lower. Analysts say this is largely due to a rise in geopolitical risk, a weaker USD currency and central banks higher demand for the safe-haven metal.

How is the stronger demand for precious metals affecting investment in project developments?
Gold and silver project developers and producers are attracting the most capital, followed closely by copper and rare earth mineral developers and producers. Diamond projects and operating mines are not attracting any form of capital at present given the depressed diamond price market and lack of demand for the expensive gemstone.

Given the strong push from Western nations to invest in critical minerals, how well positioned are SA and Africa as critical minerals producers?
There's no definition of critical minerals. The closest definition would be minerals that are essential for the green energy transition. If we apply this definition, we are referring to copper, cobalt, graphite, tin, manganese, PGMs, nickel, lead and rare earth minerals. SA is well positioned to harness its endowment of PGMs and manganese to benefit mine owners, government and local communities in this commodity super cycle the world is currently experiencing.

Given that Nedbank is positioned as a "green bank", is there a growing focus on investing in clean energy projects?
Nedbank led the funding of the restart of the Langer Heinrich Uranium mine in Namibia, owned by Australian listed Paladin Energy. This would be our greatest example of funding clean energy solutions for a greener economy. We are currently on mandate to lead arrange a funding package for Deep Yellow, another ASX listed company looking to make a final investment decision on its Tumas Uranium Project in Namibia.

Is there an increase in M&A's in the mining sector? What are some of the drivers for this and which commodities do you see as being ripe for the picking?
M&A activity can been viewed as big-ticket mergers and low-key acquisition of assets / projects.

We have been closely following:
- the failed merger of Glencore and Rio Tinto,
- the merger of Anglo American and Teck Resources, into Anglo Teck,
- locally, Exxaro's acquisition of key manganese assets in SA,
- AngloGold Ashanti's acquisition of Centamin plc,
- Zijin Gold's acquisition of Allied Gold Inc,
- Robex Resources' acquisition of Predictive Discovery in West Africa. ■

Revitalising the junior and emerging miners sector is essential for the country

A research report into South Africa's junior and emerging mining sector demonstrates the growing importance of smaller companies but that the sector is severely hamstrung and unable to deliver to its full potential.

The external study commissioned by the Minerals Council South Africa and entitled *The Extent, Nature And Economic Impact Of The Junior And Emerging Mining Sector In South Africa In 2025 - An Update From The 2019 Report* highlights the importance of the sector in terms of jobs, taxes and the future sustainability of the local mining industry, but it notes that there are constraints on exploration activities, mine development and operating mines.

"This research demonstrates that a robust and well-supported junior mining sector is essential for creating an additional 50 000 direct mining jobs and 350 000 secondary jobs supporting the mining industry in South Africa over the next decade and beyond," the report notes.

"Furthermore, it will significantly increase tax revenues for the Government, providing funds for the maintenance and expansion of national infrastructure. Junior mining can, and should, play a vital role in aiding government efforts to accelerate economic growth beyond population growth and inflation rates," it states.

> **Junior and emerging mining companies contributed R122.8 billion or 11% in revenue out of the total mining industry revenue of R1.083 trillion for the period January to December 2024.**

The report, which clearly defines what constitutes small-scale, medium- and large-scale miners, says that about 77% of mining licences and permits are granted to junior mining companies and the balance to majors, but that the junior sector generates just 11% of total mining revenue.

Junior and emerging mining companies contributed R122.8 billion or 11% in revenue out of the total mining industry revenue of R1.083 trillion for the period January to December 2024. The sub-sector provided jobs to 58,496 people directly in 2024 and potentially generated 409,472 more jobs in the South African economy when applying a job multiplier of seven.

"Herein lies the strategic opportunity for the country, and government must focus its efforts on supporting and growing junior and emerging miners to become the majors of the future."

The junior sector generates just 11% of total mining revenue.

The report suggested established mining houses can play a significant role in supporting junior miners.

The difficulties faced by the junior sector are clearly demonstrated by South Africa attracting less than 1% of global exploration expenditure in recent years compared to 8% in 2001.

Among the constraints are the difficulties in attracting investment because of a perceived uncertain and unattractive regulatory environment. Among the report's recommendations are that South Africa introduce a flow-through share incentive modelled on the Canadian model which has made that country a leading junior mining hub. At present, South Africa offers limited compelling incentives to attract foreign investors to fund mining projects.

According to the Minerals Council, using the PwC Social Accounting Matrix Model, an effective flow through share tax incentive could generate R15.8 billion in tax revenue per successful mine - including royalties, income tax and withholding tax of R9.6 billion, and induced taxes of R6.2 billion.

"By fostering a supportive environment, junior miners can drive exploration, a function previously driven in-house by majors. This exploration is vital for discovering the next generation of large-scale mines. A flourishing junior sector could create thousands of jobs, contribute significantly to the tax base and help create a new generation of mining capitalists," the report states.

While highlighting the complex environment and difficulties junior and emerging miners must traverse, the report notes positive developments initiated by the Department of Mineral and Petroleum Resources to revitalise the sub-sector.

The regulator published its strategy on exploration in 2022, it has published a strategy document on critical minerals and metals in 2025 and has jointly launched an exploration fund which is attracting investments from large mining companies.

One of the key obstacles is growing criminality and sophisticated cartels that are negatively impacting junior and emerging mining companies, requiring a far more focused and proactive response from the justice cluster as well as the DMPR, which has criminalised illegal mining activities in its draft Mineral Resources Development Bill.

The report suggested established mining houses can play a significant role in supporting junior miners. Junior miners can perform critical exploration processes, which can support majors in growing their project portfolios. Majors hold critical skills and capacity that can be shared with juniors, which will lead to fewer mistakes and avoidance of the loss of scarce capital. ■

Huawei invests heavily **in smart micro grid solutions**

In a bid to decarbonise operations and reduce high energy costs, the mining industry is rapidly turning to renewable energy, particularly solar and wind, with over 18 000 MW of renewable projects planned or implemented, notably in Africa. For insight into the benefits of adopting micro-grid solutions, *Modern Mining* spoke to Joseph Yao, Vice President of digital power Business Unit, and the MD of Mining Micro-Grid and Renewable Business at Huawei.

Joseph Yao, Vice President of digital power Business Unit, and the MD of Mining Micro-Grid and Renewable Business at Huawei.

"For decades, the mining industry has relied heavily on fossil fuels to power mining – a sector that remains integral to the development of modern society. With the shift to clean green solutions, mining is increasingly adopting renewable energy options, which bodes well for Huawei digital power, as it focuses on renewable energy solutions for the industry."

Remote mining operations, often located hundreds of kilometres from the grid, face prohibitive, up-front capital costs for infrastructure, making grid connection economically unviable.

As a result, many mining operations around the world rely on diesel generators for their power supply. However, diesel fuel is expensive, particularly in Africa.

"Energy supply is one of the most critical operational challenges for miners. In some African countries, the levelized cost of electricity (LCOE) from diesel generation can exceed 40 US cents per kilowatt-hour, which is extremely high. By comparison, in China, electricity costs can be as low as 3 US cents per kilowatt-hour. These high energy costs make it difficult to expand metal production and affect overall project economics."

Another major challenge is meeting ESG (Environmental, Social, and Governance) requirements. Many projects must provide certification for green, low-carbon mining — especially when supplying European buyers. Continuing to rely on diesel generation not only increases operating costs but also makes it harder to meet decarbonisation targets.

"For example, in the Democratic Republic of Congo (DRC), copper exports to the European Union require proof of green mining certification. Without this certification, exporters may face substantial carbon taxes," explains Yao.

The adoption of PV and the energy storage system (ESS) offer several benefits, including significantly reduced electricity costs, stable power supply, a lower carbon tax and ultimately, improved metal production.

Global Service System: Huawei has established a worldwide network of local spare parts warehouses and professional service teams across more than 170 countries, to deliver 24/7 rapid response, fully eliminating operational and maintenance (O&M) concerns for mining operations.

Integrated Fully In-House Developed Architecture: Featuring full-stack in-house development of end -to-end microgrid systems, our solution leverages a string-type modular design for easy installation, fast commissioning, simplified O&M, and ensured long-term stable operation of the system.

Core Innovative Technologies: Covering critical components including chips, IGBT models, advanced grid forming technologies, which continuously lead the industry's cutting-edge innovation, with rigorous control over product performance and quality at the very source.

"Green grid-forming technology has advanced considerably, and costs have dropped substantially. This makes our solutions practical and ready

Huawei offers safe, reliable, and economical Green Power.

Renewable energy – a driver for growth in commodities

Given that the PV industry relies on key commodities such as copper, aluminium and lithium for use in micro-grid solutions, demand for associated commodities is set to rise, with Yao estimating demand for copper to increase "three times the current rate by 2030, with lithium set to grow by as much as five times current demand".

Underpinning demand for these commodities is the push for clean energy solutions and massive growth in AI technologies.

for real-world deployment to support mining operations. It is now more cost-effective, more reliable, and far more efficient than before, making it a much more affordable solution overall," says Yao.

Adopting Huawei solutions in Africa

Yao advises that the technology specialist has successfully deployed several PV and ESS projects worldwide, including in Central Asia, Africa, and South America.

Sharing two examples of successful adoption of micro-grid solutions, he explains that the first project is in the Democratic Republic of Congo (DRC) at the CNMC copper mine, operated by China Nonferrous Metal Mining Group.

"Before implementing our solution, the mine faced frequent power outages, which resulted in unstable copper production levels of between 60–68%. We deployed an 18 MW photovoltaic (PV) system together with a 10 MWh ESS. Since commissioning the project in May last year, production stability has improved dramatically, reaching 98%. In addition, the solution materially reduced diesel consumption, helping the customer save approximately $1 million in fuel costs. This has become a strong success story demonstrating the value of our solution."

The second case is in Mongolia, where winter temperatures often fall below –40°C, creating considerable operational challenges. Running energy systems reliably under such extreme conditions required careful technical design and adaptation.

After extensive discussions with the customer in 2023, Huawei successfully deployed a project with a total capacity of 54 MW of PV and 140 MWh of energy storage. Since July 2025, the system has been operating with exceptional stability, substantially improving the customer's production performance.

"This project has proven to be a major success, and we are currently in discussions regarding the next phase of expansion in Mongolia."

To date, Huawei has deployed around 15 projects globally, including in Ghana, the DRC, Sierra Leone, Madagascar, and Mongolia. These successful implementations demonstrate Huawei's strong capabilities and extensive experience in delivering reliable solutions worldwide.

"We believe that microgrid solutions will become the primary power supply model for the mining industry in the future."

> We believe that microgrid solutions will become the primary power supply model for the mining industry in the future.

Huawei's focus on R&D

The high-tech company places strong emphasis on research and development, investing heavily in this segment of business.

"Last year our revenue exceeded $130 billion, and we invested nearly $20 billion in R&D. This substantial investment enables us to develop advanced chipsets and IGP technologies that we integrate into our equipment. As a result, our solutions deliver enhanced performance and reliability in challenging environments, including low temperatures, high-latitude regions, and humid conditions," concludes Yao. ■

Advanced digital infrastructure supports the growing energy demands of AI-driven data centres.

Mohamed Hosseiny, Oversight Country Managing Director for Africa at Hitachi Energy.

Hitachi Energy ramps up **investments to support grid readiness**

Hitachi Energy has announced a significant expansion of its global manufacturing, R&D and engineering capacity to meet soaring demand for transformers, advanced grid technologies and digital solutions as the world prepares for exponential growth in AI data centres. The company's multi-year investment programme of over $6 billion represents the largest in the power-grid sector and underscores its mission to inspire the next era of sustainable energy.

The rapid deployment of AI infrastructure worldwide is placing extraordinary pressure on global supply chains for critical equipment. According to recent market analyses, between 90 and 125 GW of new AI data-centre capacity will be added between 2025 and 2030.

This expansion alone could require between 670 and 1 400 power transformers, along with extensive volumes of switchgear, disconnectors, power-electronics systems and battery-storage solutions. Current global lead times for large power transformers range between two and four years, driven by surging demand, limited manufacturing capacity and shortages of raw materials.

Hitachi Energy is taking decisive action, it reports in its Gridlocked? AI's Energy Appetite position paper. The company is significantly expanding manufacturing capacity across multiple regions, including targeted investments to support regional energy security and mitigate supply-chain disruptions.

These investments are designed to strengthen production of high-voltage transformers, gas-insulated switchgear, advanced power-electronics solutions and digital-enabled automation systems. As part of its long-term strategy, Hitachi Energy is also modernising and expanding its global R&D footprint, particularly in the fields of digital grid management, power-system stability and next-generation transformer technology.

For Africa, these investments come at a critical moment. The continent is experiencing rapid digitalisation, with increasing interest from hyperscale cloud providers and emerging AI firms. South Africa continues to lead the region in data-centre capacity, while Kenya, Nigeria, Morocco and Egypt are attracting strong foreign and domestic investment.

Yet grid bottlenecks, constrained transmission networks and ageing infrastructure pose challenges to the sustainable growth of the digital economy. By growing its global manufacturing capacity and reinforcing its regional presence, Hitachi Energy aims to ensure that African markets have access to the technologies they need to strengthen their grids and attract digital investment.

The company's strategy is grounded in localisation and partnership. Hitachi Energy

collaborates closely with African utilities, industrial customers, data-centre developers and governments to design solutions that respond to local conditions and developmental priorities.

This includes customised engineering, service partnerships and digital solutions that enhance grid visibility, optimise operations and support the reliable integration of renewables. As Africa accelerates its energy transition, these collaborations will help ensure stable, adaptable and affordable power systems capable of supporting the demands of AI, electrification and economic growth.

Reflecting on the company's commitment to Africa, Mohamed Hosseiny, Oversight Country Managing Director for Africa at Hitachi Energy, said: "Our global investments are designed to serve local needs, and nowhere is this more important than in Africa. The continent is entering a new chapter in its digital and energy journey.

"To seize this moment, Africa needs partners who can deliver innovation at scale and support long-term industrial and societal progress. Hitachi Energy is making unparalleled investments so our customers across Africa have the technologies, expertise and dependable supply chain required to power a more sustainable and prosperous future," highlights Hosseiny.

Rapid growth in AI data centres is driving demand for resilient, high-capacity energy infrastructure.

Hitachi Energy continues to leverage the strength of the Hitachi Group, one of the world's leading industrial technology conglomerates, while advancing its vision of a sustainable energy future. With more than 50 000 employees across 60 countries and a unique portfolio of mission-critical grid technologies, the company is committed to empowering societies, enabling digital transformation, and supporting the world's shift towards more resilient, secure and affordable energy systems. ■

By combining application-specific design with OEM expertise, Sandvik Rock Processing delivers integrated crushing and screening plants tailored to operational requirements and site conditions.

Engineered-to-order plants from Sandvik Rock Processing optimise

African crushing operations

Africa's mines are increasingly recognising the value of engineered-to-order (ETO) crushing and screening product solutions, as Sandvik Rock Processing expands its tailor-made offerings designed to enhance throughput, efficiency and overall plant performance.

Tarynn Yatras, Vice-President Sales Area Africa for Sandvik Rock Processing.

While ETO is not a new concept within Sandvik, it represents a clear shift away from the traditional equipment-only supply model, according to Tarynn Yatras, Vice-President Sales Area Africa for Sandvik Rock Processing.

"While standard equipment supply answers a specific, bounded requirement, an ETO solution starts with a customer's need," Yatras explains. "We then work backwards from the desired process outcome to determine the optimal combination of equipment, layout and operational parameters. The solution could range from a smaller equipment station to a full-scale ETO turnkey crushing plant, although this excludes civil works and installation."

This approach enables customers to deploy fully integrated crushing and screening plants that are engineered from the ground up to match specific site conditions, process requirements and productivity targets.

"The requirement to provide the best solution as the original equipment manufacturer (OEM) involves deeply integrating our engineering expertise and applying site-specific knowledge," she says. "It also requires the use of advanced design tools to develop a solution that supports the customer's needs and goes well beyond conventional equipment supply."

The ETO model is particularly valuable in brownfield environments, Yatras notes, where space constraints, unusual elevations or the need to integrate with existing infrastructure can make standard solutions impractical.

"It is equally relevant where complex multi-stage crushing flowsheets must be optimised for maximum efficiency, or where energy consumption is a critical cost driver," she adds. "With electricity prices rising across many African markets, the ability to optimise energy use during the design phase - reducing kilowatt-hours per tonne processed - is becoming increasingly important."

Sandvik Rock Processing's ETO approach supports both mining and quarrying applications. A large quarry project currently underway, for example, incorporates a Sandvik 800 Series cone crusher, a Sandvik CJ615 jaw crusher and several of the company's screening solutions, demonstrating the breadth of equipment that can be integrated into a single engineered plant.

Integration also extends to Sandvik's modular screening panels, manufactured from rubber or polyurethane. In an ETO solution, the screen selection process also includes screening media apertures and media type, ensuring that screening efficiency is optimised for the specific application.

"We can choose from a wide selection of our trusted equipment and solutions across the entire ETO solution for crushing and screening," Yatras says. "This allows us to confidently offer process guarantees on how these solutions will perform."

Delivering an effective ETO solution begins with detailed engagement between Sandvik Rock Processing and the customer to gather critical application data. This includes feed characteristics, ore abrasiveness, required throughput, site layout and operational constraints.

Once this information is collected, Sandvik's Plant Designer software is used to model plant performance, simulate flowsheets and test alternative configurations.

"On larger projects, it is not unusual for 15 to 20 different flowsheet configurations to be evaluated before a final concept is agreed," Yatras explains. "Our simulation capability underpins our ability to offer process guarantees, which remains a key differentiator in an industry where equipment performance is often contested between multiple suppliers."

Sandvik Rock Processing continues to support African mines with engineered-to-order crushing and screening solutions designed to improve throughput and efficiency.

The design process is iterative, involving further collaboration between Sandvik Rock Processing's product specialists, engineers and the customer's technical teams. Where required, physical material testing is conducted at the company's in-house material testing laboratory.

"For screening equipment, for instance, Finite Element Analysis (FEA) provides an additional verification layer," she says. "This allows us to confirm the structural and mechanical integrity of custom screen designs before they leave the factory, ensuring they can withstand the dynamic loads they will encounter in operation."

Another significant advantage of the ETO model is the consolidation of supplier responsibility. In multi-OEM installations, it can be difficult to determine where accountability lies when system performance does not meet expectations. Crusher suppliers may attribute problems to screening equipment, while screen suppliers may point to upstream processes, leaving the customer caught in the middle.

"With our ETO process approach, the mine has a single OEM to engage with to deliver the plant - one that understands the full system and has engineered every component to work together seamlessly," Yatras says.

Yatras is quick to point out that Sandvik is not an EPCM house and the company remains focused on delivering crushing and screening product solutions.

"This means that the client and the EPCM are still accountable for the civil works and installation. Our product model is focused on the fast delivery of an ETO solution, allowing the client to focus on the other areas."

She emphasises that commissioning an ETO plant is not the end of the engagement but rather the start of a longer-term performance optimisation relationship. Sandvik Rock Processing offers its ACS next-generation condition monitoring system for crushers and vibrating screens. This platform provides operators and service teams with real-time data on equipment condition, enabling more informed maintenance decisions and improved uptime.

Sandvik Rock Processing combines deep equipment knowledge with a clear understanding of customer operations to deliver crushing and screening solutions aligned with site requirements.

"The value of this capability extends beyond convenience," she explains. "In one instance, where a customer's screen was connected through ACS, we were able to predict an exciter failure up to three weeks in advance. Avoiding unplanned downtime is a major contributor to lowering total cost of ownership."

Yatras notes that Sandvik Rock Processing continues to invest in dedicated ETO management resources to support the growing adoption of this concept across Africa. As mining companies respond to strong commodity prices by expanding capacity and upgrading facilities, the company sees increasing opportunity for ETO solutions.

"We are proactively taking the ETO concept to market," she concludes. "Our aim is to give customers and EPCs a clear starting point for discussions about how engineered solutions can unlock new levels of performance in crushing and screening plants." ■

Metso Lokotrack LT400J – designed for improved productivity and ease of use

Tailored to deliver improved productivity, safety and fuel efficiency, the Metso Lokotrack LT400J, recently launched in South Africa, is a true large-scale mobile jaw crusher equipped with the latest technology features to ensure ease of use. *Modern Mining* caught up with Charl Marais, Sales Manager at Pilot Crushtec, and Wayne Warren, Africa Sales Manager at Pilot Crushtec to unpack some of the key features of the Lokotrack LT400J.

Charl Marais, Sales Manager at Pilot Crushtec.

Wayne Warren, Africa Sales Manager at Pilot Crushtec.

Employees demonstrate visible, engaged leadership at Venetia Underground mine, South Africa.

Tailored to deliver improved productivity, safety and fuel efficiency, the Metso Lokotrack LT400J, recently launched in South Africa, is a true large-scale mobile jaw crusher equipped with the latest technology features to ensure ease of use. Modern Mining caught up with Charl Marais, Sales Manager at Pilot Crushtec, and Wayne Warren, Africa Sales Manager at Pilot Crushtec to unpack some of the key features of the Lokotrack LT400J.

The latest in the Metso jaw crusher series, the Lokotrack LT400J, is a powerful hybrid mobile jaw crusher designed for primary crushing of hard rock in mining and construction and producing recycled aggregates. The machine has been launched at an ideal time in the market, when there is strong demand for most commodities - precious metals (gold, platinum group metals and silver), battery metals including copper, manganese, nickel and lithium and critical minerals.

The Lokotrack LT400J is an upgrade of the Lokotrack LT120E, renowned for its high-capacity primary crushing, especially in environments with tough, abrasive materials.

To date, Metso has sold more than 20 Lokotrack LT400J units to various countries, with 10 operating in hard rock applications.

"The machine was first launched in 2024, with 16 units already sold to companies in Iceland, Finland, Belgium, Czech Republic, the UK, US, Romania and Germany. The recent launch to consumers in South Africa paves the way for those in Africa to have access to this powerful highly advanced product equipped with a new diesel-electric power line and enhanced usability to ensure maximum uptime," says Marais.

Improved productivity - a boon for miners

The Lokotrack LT400J handles large feed sizes and delivers consistently high throughput while maintaining the mobility needed to operate close to the face, thereby reducing haul distances and operating costs.

Its robust design, efficient material flow and seamless integration into Lokotrack crushing trains, make it a compelling addition to the South African and African markets.

According to Warren, the machine has three adjustable nip angles allowing for crushing a range of rock sizes.

"The Lokotrack LT400J is a highly versatile piece of equipment with advanced technology to handle a variety of material types from the arduous hard rock, soft ore, large sized rock or a finer end-product. The machine incorporates two stroke adjustments options which determines how aggressively the machine crushes the material. Most operators are familiar with this concept as associated with cone crushers, but few people realise that similar adjustments can now be made on modern jaw crushers."

According to Marais, this new design offers multiple variables that ensures adjustment for maximum efficiency, production or liner wear life.

Beyond this, the Lokotrack LT400J is equipped with a height-adjustable discharge conveyor, offering options for stockpiling.

"The height-adjustable discharge conveyor provides several benefits to the client, including higher stockpiles which decreases the need for frequent clearing by front-end loaders. In turn, this reduces traffic around the machine. Less traffic not only improves site safety but also allows the machine to continue operating for longer periods without interruption," explains Warren, adding that higher

The extended discharge conveyor offers three operating positions, improving stockpiling flexibility and maintenance access.

Night operations are enhanced by integrated LED lighting on the Metso Lokotrack LT400J, providing improved visibility and safer working conditions in low-light environments.

- **Electric main conveyor:**
  1. Adjustable discharge height for easy combination.
  2. Can be lowered horizontally for maintenance.
  3. Automatically adjustable load section.
  4. Carving scrapers, covers and high-pressure water spraying system for dust control.
- **Adjustable magnet separator:**
  1. Permanent ferrite magnet with remotely adjustable height.
  2. Electric magnet for heavy-duty metal separation as option.
- **High efficiency power transmission**
  1. All process functions electric driven (minimised hydraulics)
  2. Connection to external power grid as standard
  3. Bigger genset enables PTO to run e.g. a mobile stockpile conveyor.
  4. Composite covers and robust platforms for quick, safe & easy service
- **Easy usability**
  1. All process functions are controlled by advanced IC automation either via simple remote control or more advanced Remote IC app.
  2. Metso Metrics enables remote process monitoring.
- **Hydraulically foldable feed hopper**
  1. Impact resistant curved hopper sides (rubber as option).
  2. Extensions available for more volume.
- **Vibrating grizzly feeder**
  1. Automatic speed control.
  2. Efficient material flow with high stroke vibrating unit.
  3. Wear resistant feeder bottom (rubber as option).
- **Fixed side conveyor for feed fines (Optional)**
  1. High discharge height on both sides
  2. Transported separately
  3. Bypass chute can be hydraulically moved for crusher maintenance
- **Heavy-duty tracks and frame**
  1. FEA designed structure for optimised weight and lifetime 3-speed track drive for good turnability and speed
  2. Quick machine set up and tracking with easy radio remote control

The advanced diesel-electric drive system on the Metso Lokotrack LT400J enables lower fuel consumption and reduced operating costs.

stockpiles allow for increased volumes of material to be stored on the ground.

Fuel efficiency

Metso's next generation diesel-electric mobile jaw crusher is an impressive machine -relying on just 80 litres of hydraulic oil. Hydraulic oil is used to track the Lokotrack LT400J, operate the hydraulic rock breaker, adjust the discharge conveyor hights and adjust crusher closed side settings. All process functions like conveyors Metso C120 Jaw crusher, TK Grizzly feeder, magnetic separator and other systems are electrically driven.

"On many older mobile jaw crushers, the oil volume is almost double the quantity of the new machine. The Lokotrack LT400J is largely electrically powered, it requires a CAT C9.3B 310 kW diesel engine that drives the onboard generator, thereby dramatically reducing fuel consumption and significantly lowering CO_2 emissions when operating in diesel mode. Alternatively, the machine can also be plugged directly into grid power," says Marias.

For the power challenged local market, the key advantage for many customers is fuel cost savings.

To further improve operating efficiency, the Lokotrack LT400J is outfitted with a 1 000-litre fuel tank, allowing the machine to operate for up to 50 hours before refuelling. Downtime refuelling the Lokotrack LT400J is reduced with an onboard refuelling pump pumping at a refuelling rate of 80 l/min. This means less downtime, improved productivity and reduced operational delays.

Impressively, the machine comes equipped with a 10 000-hour, five-year Equipment Protection Services (EPS) warranty, and extensive training for operators before use.

The EPS warranty on Metso equipment is a first in the industry and sets a new benchmark for crushing and screening equipment support. The Metso EPS warranty extends the standard factory warranty from 1-year/2 000 hours to 2-years/4 000 hours. The additional 3-year extension covers major components of the equipment for the full 5-year/10 000-hour period.

Ease of product maintenance

The machine has been designed for ease of use and maintenance.

"Mobile crushers typically have extremely compact layouts, making machine maintenance challenging. In the case of the Lokotrack LT400J, the simplified hydraulic system and reduced number of oil-driven components ensure maintenance access and servicing become easier and more efficient. Technicians can easily access critical components for maintenance. For example, access to the front and under the jaw crusher is achieved simply by lowering the discharge conveyor to the ground. At the rear, the chutes can be hydraulically moved, allowing technicians to reach the back of the crusher quickly, safely, and without unnecessary effort. This thoughtful design reduces the time and complexity typically associated with maintenance access," explains Warren.

Further to this, the engine area is equally well designed. Gull-wing doors open fully to provide unobstructed access to the engine and generator compartment. This allows technicians to step into the engine bay, making inspections, servicing, and routine maintenance faster and far more convenient.

The machine also incorporates Metso's proven liner handling arrangement, complete with dedicated slinging points for the safe removal and installation of liners. This system removes the need for unsafe lifting practices and ensures that maintenance can be carried out in a controlled and safe manner.

"Inside the jaw crusher are two extremely heavy liners. On many conventional crushers, removing these liners can be a difficult and sometimes hazardous task because they are typically hooked into place and then bolted down. In some cases, operators must weld lifting lugs onto the liners to remove them, which introduces additional safety risks and wastes valuable maintenance time. With this machine, that process is completely simplified. A lightweight aluminium step is supplied so operators can safely enter the crusher chamber when installing the rigging equipment. The liners themselves are designed with pre-engineered lifting holes, allowing the supplied rigging equipment to be attached directly. The result is a much safer and far more efficient liner change process," adds Warren.

Concludes Marias: "When this is combined with the fuel efficiency improvements, the result is a machine that spends far less time standing idle for refuelling or maintenance—and far more time doing what it was built to do: crushing and producing."

Impressive features of the Lokotrack LT400J

Robust and aggressive jaw crusher:

- High efficiency electric motor with optimised flywheel inertia.
- Hydraulic setting adjustment.
- VFD as standard for easy cavity clearance. ■

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Long-distance conveyor systems to transport bulk material such as iron-ore, bauxite, coal and copper.

Forging ahead into Africa: **LIBO Group's global growth strategy**

Chinese multinational technology corporation, Huawei's, strategic and collaborative partnerships with companies such as LIBO Heavy Industries Science & Technology Co., which specialises in the R&D, manufacture and operating of bulk material handling equipment, aligns with its focus on digital microgrid energy in the mining industry.

Speaking to *Modern Mining* on the side-lines of Mining Indaba, Meitong Zhou, CFO of LIBO Group, discussed the company's development strategy into Africa.

LIBO Group specialises in intelligent long-distance conveyor solutions, partnering with Huawei, who is the leader in power solutions, especially for the African mining sector. Clean energy solutions include PV (Photovoltaic) systems and ESS (Energy Storage Systems). LIBO Group and Huawei have partnered to deliver professional solutions and products for belt conveyor demonstration projects that are intelligent, efficient, green, low-carbon, and high-capacity. Together, they are building benchmark projects for green mines and smart mining conveyor systems.

"Our focus is to provide efficient, cost-effective, intelligent, environmentally friendly, low-carbon, and high-capacity transport solutions for the mining industry. The LIBO Group's conveyor systems are ideal for Ultra-Long-Distance Bulk Material Conveyance including 50 mtpa. Mine owners can focus on mining, while the long-distance transportation of bulk materials from the mine to the processing plant or port can be handled by the LIBO Group and Huawei."

According to Meitong, given the challenges such as heavy rainfall and its adverse impact on road infrastructure, mining companies are increasingly adopting conveyor systems as an alternative solution.

"While a rail system is ideal for the transport of bulk material; constructing a rail system in Africa is often costly and takes several years to complete. These factors make conveyor belt systems an attractive solution, as they can be installed within a year and quickly begin transporting materials at high capacity. In addition, they enable year-round bulk material transport and can operate reliably even during the rainy season. Moreover, LIBO offers flexible cooperation models, including tailored financing solutions, localised technical support, and modular designs that adapt to diverse terrain and operational requirements across African regions."

For instance, LIBO's 'Pay-per-Ton' model—already deployed in Serria Leone and Indonesia—reduces upfront CAPEX by over 60%, while its EPC+O (Engineering, Procurement, Construction + Operations) model enables clients to outsource full lifecycle management—from design and build to maintenance and performance optimisation—under a single, outcome-based contract.

Additionally, LIBO provides hybrid financing structures combining sovereign guarantees, green bonds, and vendor leasing, tailored to match project cash flow profiles. For project upgrades, the 'Retrofit-as-a-Service' option allows phased integration of intelligent conveyors into existing infrastructure

with zero capex and revenue-sharing terms tied to throughput gains. This model shifts financial risk from mine operators to LIBO, aligning incentives with measurable output—such as achieving 50 million tons per annum on a 100-kilometre corridor while enabling rapid deployment without balance-sheet impact.

Conveyor-belt systems align with miner's ESG drive

Long-distance conveyor systems support the industry's push toward reducing carbon emissions and deliver multiple advantages. They lower diesel consumption by up to 70% when compared to truck haulage, reduce 120 000 tons of CO_2 annually per 100-km corridor, and—per IEA 2025 Global Energy Review—rank among the top three most scalable low-carbon mining enablers. As the International Council on Mining & Metals affirms: "Electrified conveyance isn't just incremental improvement; it is infrastructure that embodies the sector's net-zero transition." This shift transcends engineering—it redefines responsibility. Every ton moved without combustion is a silent covenant with future generations, every kilometre electrified, a recalibration of progress against planetary boundaries.

We have developed advanced technologies, including intelligent long-distance conveyor systems capable of extending over 150 kilometres, enabling direct material transport from mines to ports or other designated destinations. In addition, we have engineered high-angle belt conveyors that operate at gradients exceeding 38 degrees. These innovations make our conveyor systems highly adaptable to complex geological conditions and open-pit mining environments. For example, our conveyor systems can traverse mountainous terrain and other challenging landscapes, significantly reducing overall transportation distances. Once the conveying system is installed, mines located along the route can connect directly to it, minimising the need for additional infrastructure and lowering transportation costs. Overall, this solution supports greener, more efficient, and more sustainable mining operations."

Based on years of accumulated experience, our company has developed a comprehensive intelligent control system that effectively addresses:

- Effective prevention of belt drifting, overlapping, and slippage;
- Flexible control abilities for complex terrain and various loading conditions;
- Rapid fault location along the conveyor line;
- Remote operation and maintenance capabilities.

"The R&D adopts intelligent direct-drive permanent magnet motors to achieve smart power balancing of multi-motor drives, intelligent speed regulation, safe braking, and ultra-energy-saving operation."

In summary, LIBO's sophisticated belt conveyor system design, in-house R&D and production of all core components, and intelligent control system ensure safe, efficient, energy-saving, and environmentally friendly operation. This significantly enhances overall equipment reliability while considerably reducing maintenance costs.

While the LIBO Group remains active globally, providing long-distance conveyor systems to transport bulk material such as iron-ore, bauxite, coal and copper for China, Indonesia, Vietnam, Mongolia, Peru, Geneia, DRC and Serria Leone, the company is eager to grow its footprint in African mining.

The LIBO Group's conveyor systems are ideal for Ultra-Long-Distance Bulk Material Conveyance including 50 mtpa.

LIBO Heavy Industries Science & Technology specialises in R&D, manufacture, and operating of bulk material handling equipment.

LIBO Group and Huawei have partnered to build benchmark projects for green mines and smart mining conveyor systems.

"LIBO and Huawei are committed to empowering African mining, especially by co-developing tailored infrastructure with local governments and communities—prioritising job creation, skills transfer, and low-carbon technology adoption. With Africa's mineral wealth poised to fuel global energy transitions, LIBO's conveyor solutions align well with the continent's urgent need for resilient, cost-effective, and environmentally responsible logistics. Pilot projects are slated to launch in Africa by 2026—each designed to reduce transport emissions by over 60% when compared to truck-based alternatives. These initiatives reflect not just infrastructure investment, but a commitment to shared value—where mining progress uplifts people, preserves ecosystems, and accelerates Africa's sovereign industrial development," concludes Zhou. ■

Quarries turn to multifunctional machines to cut costs and boost efficiency

In an operating environment marked by rising input costs, tighter margins and increasing pressure to do more with less, quarry operators are rethinking their equipment strategy. There is a noticeable shift from single-purpose machines to versatile, multifunctional solutions, according to Andre Kruger, Astec Industries regional product and sales manager. He reports increasing demand from the local aggregate sector for Astec-Telestack's range of bulk material handling systems and Rock Breaker Technology's Astec-BTI hydraulic breakers and boom systems.

> The simple construction of the breakers ensures reliability and low maintenance, which make them ideal for quarries striving to manage costs. Simplicity of design is, in fact, a key element of the Astec-BTI breaker system.

These renowned, high-performance brands, both of which are supplied and serviced in South Africa and across the African continent by Astec Industries, are helping astute producers to keep their costs down and productivity up, Kruger states. Astec-Telestack products deliver enhanced flexibility and efficiency in handling dry bulk material, whether from the pit, the port or plant. Rock Breaker Technology is a leading provider of Astec-BTI hydraulic rockbreakers, boom systems and demolition attachments.

"By replacing traditional fixed infrastructure with mobile, high-capacity and versatile bulk material handling systems from Astec-Telestack, customers can reduce operational costs by up to 80% in some applications, maximise production rates and reap the benefits of superior flexibility. Astec-Telestack's tracked, wheeled and rail-mounted conveyors, hoppers and stackers allow operators to move from pit-to-port, often eliminating the need for wheel loaders and trucks.

"Astec-Telestack equipment is used for stockpiling and linking in quarries around the world, handling an array of materials from road base to limestone. All these quarries recognise the many benefits of Astec-Telestack products, including eliminating the need for front end loaders on the site - along with their labour, fuel and maintenance costs. The double handling of the material is reduced and productivity increased. With Astec-Telestack products, different grades or material can be moved and stockpiled quickly and efficiently."

Astec-BTI rock breaker systems increase quarries'

Astec-Telestack TC 421R tracked radial stockpiling conveyor.

throughput and improve safety. Kruger expands: "By reducing material to the correct size and reducing material blockages efficiently, Astec-BTI rock breakers reduce crusher downtime and increase overall plant productivity. Safety is improved because these systems eliminate the need for secondary blasting and reduce the need for manual handling of rock by operators."

Astec-Telestack radial telescopic stackers - like the AggStack TS 36 X 140 and the RSL30 fixed radial stacker - offer one of the most cost efficient and effective ways of stockpiling material on the market, Kruger states. "The AggStack unit has a production capacity of 800 mtph while the RSL30 delivers 450mtph. The reduction of segregation, degradation, contamination and compaction when stockpiling with this equipment ensures 'in specification' material for any application. They offer 30% more stockpile capacity on the same footprint compared to standard stackers."

Available as tracked or wheeled units, with automation, dust suppression and independent power options, Astec-Telestack stackers can be used in mobile or fixed crushing and screening operations. A further benefit of Astec-Telestack's radial telescopic stackers is that they minimise the need for wheel loaders. This translates into less site traffic, lower emissions and substantial savings on fuel and labour. The automated stockpiling option cuts staffing requirements, further reducing costs.

Astec-Telestack offers the widest range of mobile conveyors in the industry. Machines like the Astec-Telestack TC 424XR Radial Mobile Conveyor and Feeder – which boasts a 450 mtph capacity - are designed for flexibility and can be deployed quickly across different site locations.

Astec-Telestack's Origin Wheeled conveyor range - which includes the C2000 - offers affordable wheeled stackers combined with the proven Astec-Telestack quality. Suited for short to medium term, highly mobile applications, the C2000's versatility and portability ensure that it can meet the needs of any stockpiling application, especially in confined areas. It is particularly suited to applications where movements are frequent. Featuring a radial ability from pinned base, it offers superior stockpiling capabilities compared to other, conical stockpilers.

Engineered for surface and underground mining as well as aggregate, construction and demolition applications, Astec-BTI breakers are renowned for their reliability and design simplicity. "The simple construction of the breakers ensures reliability and low maintenance, which make them ideal for quarries striving to manage costs. Simplicity of design is, in fact, a key element of the Astec-BTI breaker system," Kruger notes. "The breaker's control valve also features a simple design to minimise cavitation, thereby reducing hydraulic component wear and increasing the efficiency and lifespan," he adds.

Another noteworthy feature is the excellent power-to-weight ratio. "This offers significant benefits to customers, since larger, more powerful hammers can be mounted on smaller excavators or boom systems, resulting in reduced overall cost to the end user," states Kruger.

Standard features on all models include a nitrogen cushion chamber designed to absorb piston recoil and recycle the energy to increase the output energy on the next blow, dual retainer pins to ensure positive tool alignment and easy tool replacement, short tie rods that utilise protected threads to yield long life and high reliability, and a protected lubrication point.

Kruger says that mobile and fixed hydraulic rock breakers are increasingly being used for reducing oversize material, rather than secondary blasting. "Astec-BTI's Rock Breaker Systems minimise disruptive, costly and unsafe blasting, providing an efficient, safer alternative," he says. "Rock breakers provide for selective breaking, as opposed to the indiscriminate nature of blasting," he adds. "This can improve material grades, which boosts sales revenue."

The Astec-BTI CX, BX and BXR range of rock breakers offer14 models, from 550 joules to 21 500 joules energy class, with most also available in box-style configurations.

Local customers purchasing Astec-Telestack and Astec-BTI equipment through Astec Industries in South Africa can have peace of mind knowing that it comes with Astec's 24/7 after-sales service, back-up and spares, Kruger says. "We have local engineers dedicated to these product ranges. They will assemble and commission a customer's machine, offer operator training, service and back-up. We also hold spares, to minimise downtime and ensure that our customer can be back in business as quickly as possible. In addition, Astec engineers are able to undertake on-site repairs," he concludes. ■

Integrated Pump Technology **strengthens local readiness as extreme weather reshapes dewatering strategies**

Extreme weather events and climate-related disruptions are increasingly placing South Africa's mining and infrastructure operations under pressure, with recent devastating floods in the country's northern provinces again highlighting the critical importance of reliable rapidly deployable dewatering solutions.

Jordan Marsh, Managing Director at Integrated Pump Technology.

Godwin diesel-driven pumps provide reliable high-capacity dewatering for demanding mining, construction and emergency applications.

Extreme weather events and climate-related disruptions are increasingly placing South Africa's mining and infrastructure operations under pressure, with recent devastating floods in the country's northern provinces again highlighting the critical importance of reliable rapidly deployable dewatering solutions.

While numerous companies supply dewatering pumps across southern Africa, Integrated Pump Technology continues to differentiate itself through its strong local stockholding of both electrical submersible pumps and diesel-driven pump units, as well as its proven capability to engineer robust diesel pump sets designed to perform in some of the toughest mining conditions on the continent, says Managing Director, Jordan Marsh.

Speaking to *Modern Mining*, Marsh says that as changing rainfall patterns and escalating flood risks reshape how mines and infrastructure operators approach water management, the ability to respond quickly with fit-for-purpose pumping systems has become a strategic requirement rather than a contingency measure.

"Integrated Pump Technology's model is built around this reality, combining readily available equipment, application-specific technical expertise and a strong national support network to ensure effective response in emergency and high-risk scenarios," he says.

"Flooding events place immediate and severe pressure on operations, particularly in surface and underground mining where water ingress can quickly compromise safety and production," he continues. "What makes the difference in these situations is not only having the right pump technology, but having that equipment available locally and supported by a team that understands the application and can mobilise quickly."

Grindex submersible pumps deliver robust, energy-efficient dewatering performance in tough mining and industrial environments where reliability and continuous operation are essential.

With proven durability and self-priming design, Godwin diesel-driven pumps deliver versatile dewatering solutions that reduce downtime.

A core component of the company's offering is its local stockholding of Grindex electrical submersible pumps, which are widely recognised for their durability and reliability in harsh dewatering environments. These pumps are designed to handle abrasive water and suspended solids, making them well suited to both surface and underground mining applications where continuous operation is often required during flood conditions. Built with robust motor protection and capable of operating in fluctuating power environments, Grindex pumps are frequently deployed in emergency dewatering situations as well as for longer-term mine water management where reliability is critical.

Complementing the electrical submersible range is Integrated Pump Technology's portfolio of Godwin diesel-driven self-priming pumps, which remain a cornerstone of high-volume dewatering strategies, particularly in remote or power-constrained locations.

Known for their ability to handle large solids, high flows and demanding duty cycles, Godwin pumps are widely used in open pit dewatering, flood response and infrastructure applications where rapid deployment and dependable performance are essential. Integrated Pump Technology is especially well regarded for its in-house capability to design and build diesel-driven pump sets tailored for extreme mining conditions including abrasive fluids, variable flows and prolonged operation in harsh environments.

"Diesel-driven pump technology remains a vital component of dewatering strategies, particularly where power supply is limited or compromised during extreme weather events," Marsh explains. "Our experience in building and supporting these pump sets locally allows us to deliver solutions that are engineered specifically for the conditions our customers face on site."

Despite its continued expansion across Africa, Integrated Pump Technology maintains a strong focus on supporting local operations within South Africa. This includes not only maintaining substantial local stockholding but also providing comprehensive aftermarket support, technical expertise and rapid response capability - all of which are increasingly important as climate volatility drives more frequent and severe weather-related disruptions.

For mining operations, both surface and underground, effective dewatering during extreme weather events is essential to maintaining operational continuity, protecting infrastructure and ensuring the safety of personnel. By combining robust electrical submersible and diesel-driven pump technologies with strong local support, Integrated Pump Technology is helping operations adapt their dewatering strategies to a rapidly changing risk landscape.

"As climate volatility increases, dewatering can no longer be treated as an afterthought," Marsh concludes. "It requires planning, proven technology and partners who can respond decisively when conditions deteriorate. That remains our focus - delivering dependable pumping solutions that perform when they are needed most." ■

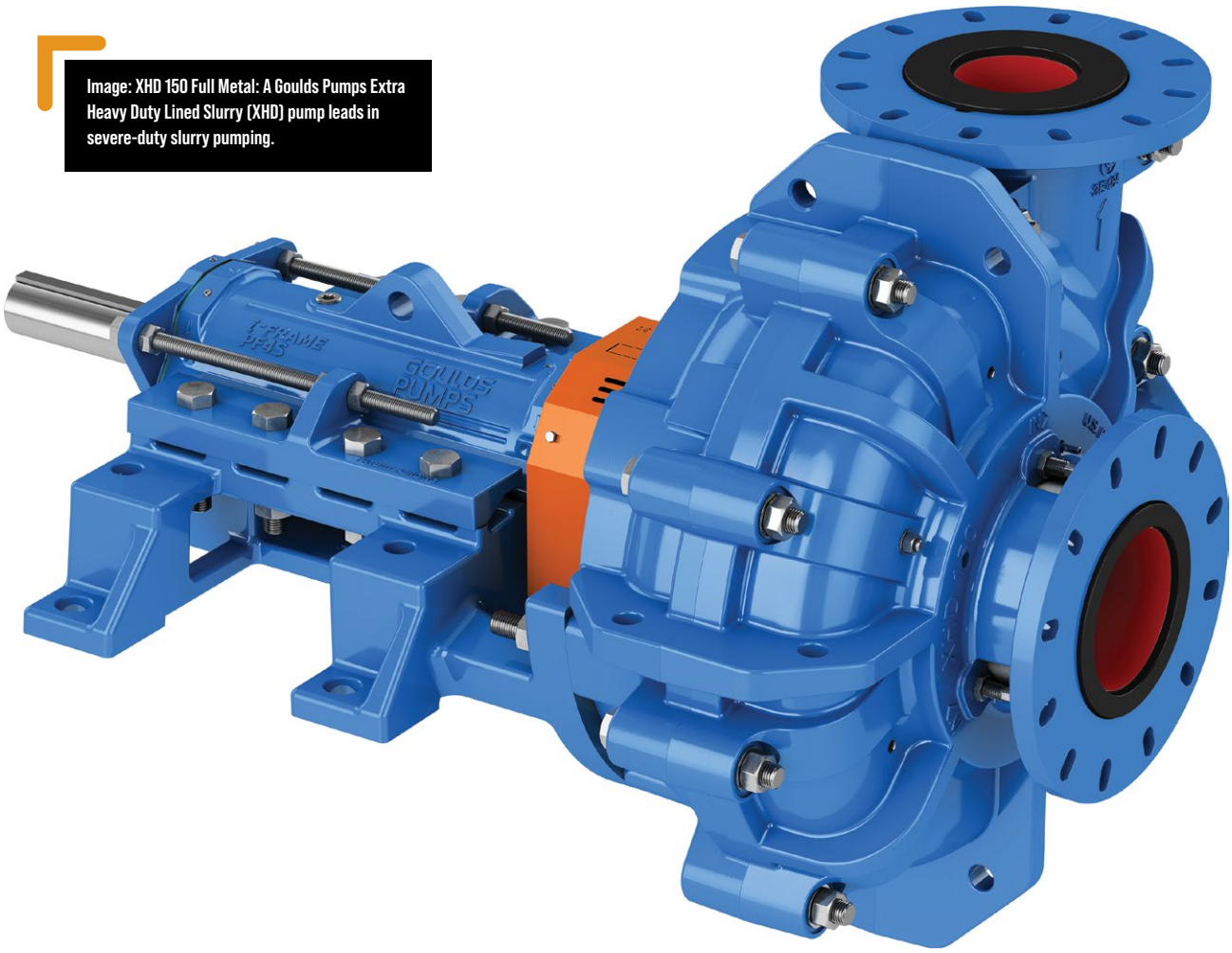


Image: XHD 150 Full Metal: A Goulds Pumps Extra Heavy Duty Lined Slurry (XHD) pump leads in severe-duty slurry pumping.

The value of integrated pumps and mixers for mining operations

By Antonio Iniguez, Market Manager – Mining and Minerals, Lightnin, and David Dowd, Product Specialist, Slurry Products, ITT Goulds Pumps

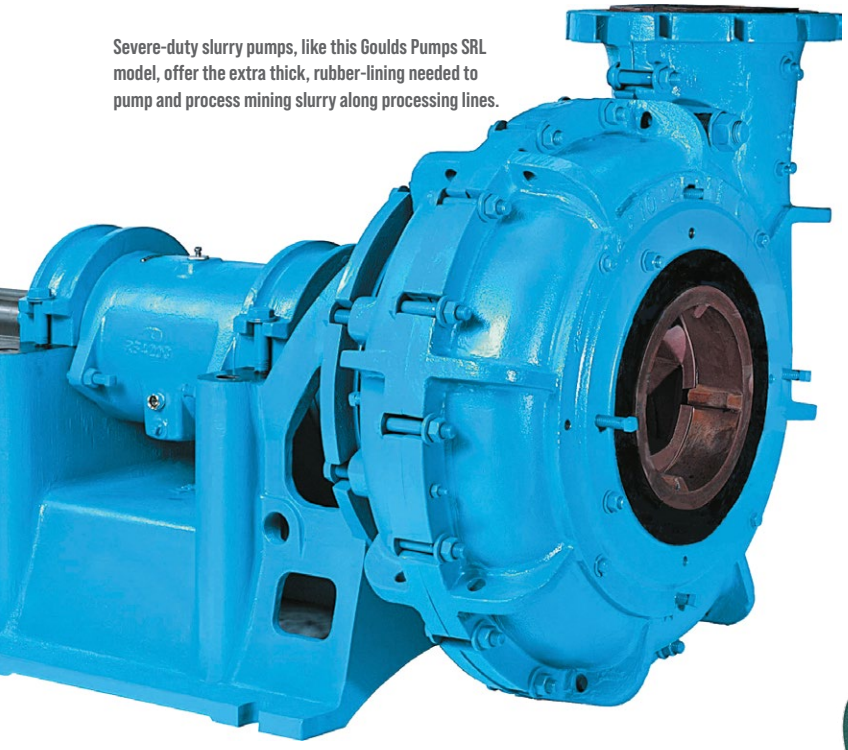
It's no secret that mining operations are evolving at a rapid pace. Lithium, cobalt, nickel, rare earth elements, and more are in high demand, driven in part by electrification and the broader global energy evolution. Meanwhile, the conditions under which those minerals are extracted are becoming more complex, including declining ore grades, deeper mines, and stricter processing requirements, making the need to streamline processes and improve efficiencies more important than ever, especially in the extraction process.

The extraction of metals from minerals frequently relies on a sequence of pumping materials into a tank, extracting the desired element from the surrounding material through chemical processes that require mixing, and then pumping those streams for further refinement or disposal. This "Pump-Mixer-Pump" process is fundamental to how metals are extracted and refined. When those elements are not aligned, inefficiencies tend to follow.

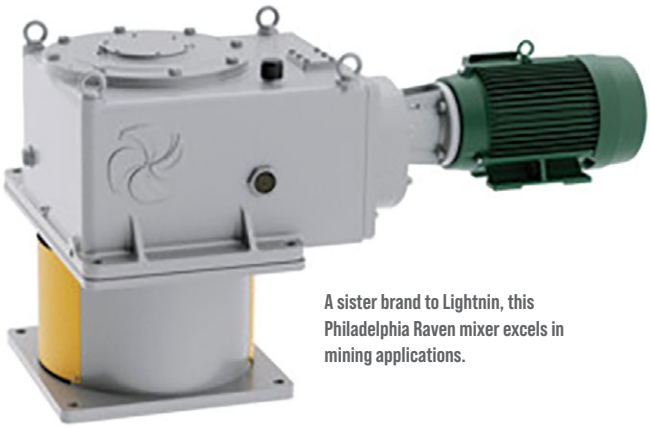
To that end, ITT Inc. recently acquired SPX FLOW, bringing together two established categories of products (pumps and mixers) to address that critical sequence. ITT Goulds Pumps has long been associated with reliable slurry and process pumping in mining environments. The addition of SPX FLOW's Mixing Solutions Portfolio brings deep expertise in mixing and agitation across a wide range of mineral processing applications.

But bringing SPX FLOW and its portfolio into the ITT family represents more than just new products. In addition to an expanded line of solutions, the combination also introduces a deeper level of understanding across the full extraction sequence, allowing hidden challenges to be identified and addressed earlier.

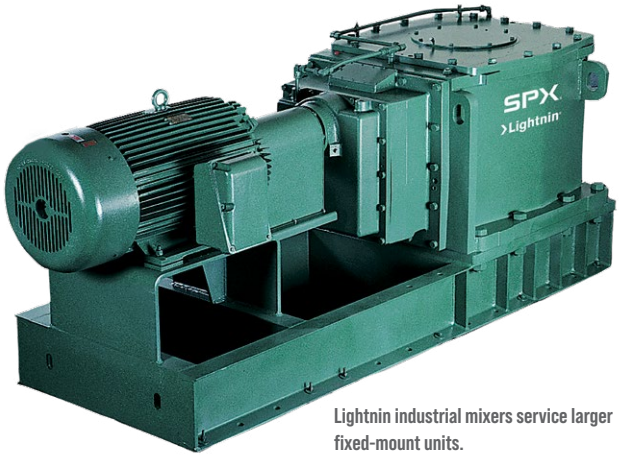
Usually, inefficiencies in mining are not caused by a single piece of equipment. Instead, they develop over time, often at the intersection between stages. For example, some



Severe-duty slurry pumps, like this Goulds Pumps SRL model, offer the extra thick, rubber-lining needed to pump and process mining slurry along processing lines.



A sister brand to Lightnin, this Philadelphia Raven mixer excels in mining applications.



Lightnin industrial mixers service larger fixed-mount units.

mixing systems may no longer be optimized for evolving process conditions. Pumps are then required to handle inconsistencies in slurry that lead to increased wear, higher energy consumption, or reduced throughput. These issues are magnified when legacy equipment becomes difficult to maintain or support and doesn't work well in tandem with other parts.

This is where the expertise behind the equipment becomes critical. SPX FLOW's Mixer Modernisation and Reliability (MMR) approach provides a practical example. In one mining operation, a fleet of aging mixers was experiencing frequent failures, long repair times (20 weeks), and declining performance due to obsolete gearbox designs and limited access to OEM parts.

Rather than replacing equipment outright, SPX FLOW conducted a full system assessment, reverse-engineered critical components, and implemented a structured maintenance and inventory strategy. The result was a significant reduction in unplanned downtime, improved repair quality, and a measurable increase in mean time between failures over time.

What stands out in this example is the approach to solving the problem, not just the solution itself. The focus was on understanding how the mixing system performed within the broader process and addressing the root causes of failure, rather than reacting to individual breakdowns.

When combined with ITT Goulds Pumps' experience in slurry transport and dewatering, this type of insight now extends across the entire process. It's possible to evaluate how material is delivered into a tank, how it is treated during mixing, and how it is transferred downstream. In doing so, operators can identify inefficiencies earlier and make adjustments that improve overall system performance.

This perspective is especially valuable in critical applications such as conditioning, leaching, and high-pressure oxidation. In these environments, improper mixing or flow can have downstream effects on recovery, energy use, and equipment life. Aligning pumping and mixing strategies helps create more stable operating conditions and reduces the likelihood of unplanned disruptions.

> The addition of SPX FLOW's Mixing Solutions Portfolio brings deep expertise in mixing and agitation across a wide range of mineral processing applications.

In conclusion, pumping and mixing no longer have to be looked at as separate functions. Instead, they are interconnected steps that should influence each other at every stage of the mining process. When aligned, operators can achieve better performance and improved recovery.

The combination of ITT Inc. and SPX FLOW is still fresh. However, what is immediately clear is that bringing together expertise in both slurry transport and mixing, the mining industry will be better equipped to understand how material behaves and to address challenges before they impact production. ■

Jesper Jonsson is regional environment and social director for RSK Africa, based in Dar es Salaam, Tanzania.

We must find ways to de-escalate conflicts and work with artisanal miners

Artisanal and small-scale mining (ASM) is a primarily informal sector that is increasingly coming into conflict with large-scale mining operations. RSK Africa Regional Environment and Social Director Jesper Jonsson believes that the situation will only get worse unless we explore more empathetic approaches focused on de-escalation between large and small-scale miners.

Predominantly in emerging economies, ASM ranges from a person panning in a river to a mining pit using compressors, generators and electrical drills. It is a sector rarely captured accurately in formal statistics, yet it involves millions of people and provides more than 80% of the world's gemstones and up to 20% of the world's gold production.

Conflict between ASM and large-scale industrial mining is not a new phenomenon. It can emerge when long-standing artisanal activity overlaps with newly allocated concessions, or from artisanal and small-scale miners moving into abandoned mine shafts or even into operational mines. In extreme cases, artisanal miners may be influenced or exploited by criminal elements.

Traditional approaches – particularly evictions – have tended to intensify tensions rather than resolve them, exposing concession owners to community backlash, legal action, media scrutiny and heightened environmental, social and governance (ESG) risk, with several high-profile cases having gone to court and resulted in costly settlements. These responses focus on symptoms rather than the underlying drivers of informality, leaving artisanal miners vulnerable and operators without durable solutions. With ESG a growing topic in the mining sector, especially for companies listed or financed internationally, a new focus on de-escalation and cooperation has a great many advantages.

> ASM involves millions of people and provides more than 80% of the world's gemstones and up to 20% of the world's gold production.

Small and large-scale miners are not necessarily competing for the same deposits. Artisanal miners rarely work below 50–100 metres deep due to the complexity of managing oxygen and the need for dewatering. Mponeng Gold Mine near Johannesburg, by contrast, now reaches nearly 4 000 metres deep. Where artisanal and small-scale miners are looking for high-value, close-to-surface deposits, large-scale mining companies typically focus on volume for long-term feasibility, including in lower-yield ore bodies. Theoretically, then, the two groups do not need to be in conflict and could instead cooperate and coexist.

One cooperative method we've seen tested is for ASM operators to be given mining access to an area on the concession. By providing a legal access area, it is less likely that ASM operators will be exploited by criminal elements, and this also helps build institutional arrangements where the concession owner has some control and influence over who

can access the mines and how they mine. Additional support such as equipment loans or geological assessments or maps can help build trust between the two groups and create opportunities to improve health and safety, for example.

This, of course, requires an understanding of the set-up. Just because a sector is informal does not mean it is disorganised, and there can be strict internal roles with claim owners, drillers, ore carriers, buyers, service providers and more.

We've seen some mines incorporate this with offtake arrangements – a 'promise to buy' – for small-scale miners with a guaranteed minimum price. This means supply chains can be integrated and allows conditions to be set, such as forbidding the use of mercury for the extraction of gold. We know from baseline studies of supply chains that where gold is produced informally, mercury is often making its way in, causing pollution and poisoning those same informal workers, so this cooperation can have multiple benefits.

For concession owners and mine operators, cooperation does come with liability concerns, as a person mining in the concession is the owner's responsibility. Health and safety problems, prevalent in small-scale mining, then become the concession owner's health and safety problems; child labour becomes the owner's child labour; accidents become their accidents. Waste dumps, as an example, are notoriously dangerous, and if the spills were to fall or slip, there is real risk of injury to the people on it.

It's perhaps no surprise then that the traditional approach is aimed at removing the risk and liability of artisanal mining by providing alternative livelihoods for those people, often set up as part of support programmes or resettlement plans. This can work, but only if proper baseline studies are conducted that capture income patterns, household dependence, gender roles and seasonality, and if genuine effort to understand the people is made. As a Danish person, I often point to our dairy sector as proof of how a cooperative can work, but we know from experience that this doesn't always translate across cultures and countries. Too often the miners' earnings are underestimated, the viability of proposed alternative livelihoods is overestimated and there is a fundamental lack of understanding of the agency and entrepreneurial approach to many ASM operators. They may prefer being in smaller groups where they trust everyone instead of a cooperative set up by an NGO or a Western-run mining organisation.

While there is no single proven approach to this conflict, we know that evictions are not a solution, and we must try to forge a less confrontational approach underpinned by empathy; artisanal miners are hard-working people looking for a livelihood, no different from those who moved to Klondike or California in the gold rushes of the 1800s. With the price of gold passing $5000 per ounce now, the conflict between small-scale and large-scale mining will only worsen if we do not. ■

Small and large-scale miners are not necessarily competing for the same deposits.

ASM is a sector that involves millions of people.

MMD Group acquires global rights TraxIQ from Anglo American

MMD Group acquires rights for TraxIQ from Anglo American.

MMD Group (MMD), a global manufacturer of material sizing and handling systems, recently signed an agreement with global mining company Anglo American to transfer the intellectual property rights for TraxIQ to MMD. TraxIQ is a system-level material handling solution, originally developed by the mining company.

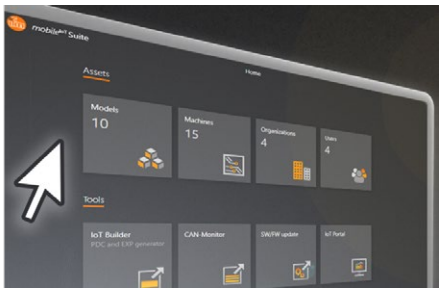
As owner of the TraxIQ IP, MMD will be able to lead the industrialisation, commercialisation, and global deployment of TraxIQ, which may also include collaboration opportunities with Anglo American where appropriate.

With global mineral and metal demand continuing to accelerate, the mining industry is under increasing pressure to manage complexity while adopting new approaches to improve productivity, lower emissions, and reduce total cost per tonne. TraxIQ represents an ambitious new model for material handling. Its system-level architecture is designed to support scalable deployment across diverse mining environments, integrating modular vehicle architecture, advanced energy-management strategies, and integrated autonomous control systems.

MMD's Centre of Excellence in the Isle of Man is working on industrialisation and product development, drawing on its global engineering, manufacturing, and materials-handling capabilities. The company will also be working with select industry partners to deliver phased pilot deployment and validation in operational environments.

"TraxIQ forms a core component of our intelligent movement portfolio. Our established global footprint and deep domain expertise in material handling and mining integration, make us best placed to bring vision to the market," said Martin Vorster, Group Managing Director at MMD Group. ■

mobile IoT: the cloud solution for mobile machines



With mobile IoT, the benefits of digitalisation are also becoming a reality for mobile machines. Monitoring the performance status of a machine fleet, needs-based maintenance planning and software updates over the air – mobile IoT does it all.

In a nutshell: with mobile IoT you can get the most out of your machine fleet mobile IoT is a fully integrated, scalable end-to-end solution consisting of hardware and software. The hardware maintains the dialogue between the machine and the cloud software where the information from all the networked machines converges centrally. This makes it possible to find out the exact status and location of the machine at any time. Similarly, you can efficiently distribute software updates to your fleet via the mobile IoT cloud.

Regardless of whether you require a solution to permanently analyse and optimise prototypes in real field tests, to plan and prepare your rental fleet management more effectively, or to establish a convincing after-sales service, mobile IoT is the right choice for a wide variety of applications.

A data portal is also provided, allowing you to visualise and keep a perfect overview of all the collected data and use cases.

mobile IoT gateway product benefits

Reliably managed: With mobile IoT, individual components, complex machines or even the entire fleet can be managed and individually configured.

Wireless connection: Mobile IoT enables a fast, simple and secure remote connection to the machine.

Tailored: The hardware and cloud solution are perfectly matched and enable simple implementation of the entire system.

Clearly structured – everything in one place: With the mobile IoT DataPortal, all relevant machine data can be collected, analysed and visualised cyclically. ■

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