

# MODERN MINING

April 2023 | Vol 19 No 4



**CROWN**  
PUBLICATIONS

For people who are serious about mining



## IN THIS ISSUE

- **Enaex targets Southern African market**, eyes West Africa
- **Lifozone Metals unlocks opportunities** for the green economy
- **Milestone reached on Palabora shaft-sinking** contract
- **MTN: Technology leads the mines** of the future



 **Enaex**  
Africa

# THE 777 YOU KNOW, AND LOVE HAS JUST GOTTEN BETTER.

Still featuring caterpillar's class-leading durability and the reliability that you have come to expect from the range, now with enhanced performance and fuel efficiency.



For your convenience, the new range offers an improved engine, transmission and oil pump as a few of its feature sets with parts availability 24/7, via [Parts.Cat.Com](https://Parts.Cat.Com).



Furthermore, it now comes with an integrated CAT® Water Delivery System.



SCAN THE QR CODE FOR  
MORE INFORMATION OR  
CALL 010 040 7398



LET'S DO THE WORK.™

© 2023 Caterpillar. All Rights Reserved. CAT, CATERPILLAR, LET'S DO THE WORK, their respective logos, "Caterpillar Yellow", the "Power Edge" trade dress as well as corporate and product identity used herein, are trademarks of Caterpillar and may not be used without permission.



Barloworld  
Equipment



# CONTENTS



## ARTICLES

### COVER

8 Enaex targets Southern African market, eyes West Africa

### COMMODITIES OUTLOOK

12 Copper's prices rally, falter

### PLATINUM

14 Strong demand growth outstrips constrained supply

### NICKEL

16 Lifezone Metals unlocks opportunities for the green economy

### COPPER

20 Murray & Roberts Cementation reaches milestone on Palabora contract

### PUMPS & VALVES

24 Atlas Copco and IPR affirm focus on customer applications

### TECHNOLOGY

32 VoltVision's technology helps African mines unlock value from big power data

34 Shell helps miners lower their carbon footprint



### MODULAR PLANTS

36 Africa growth continues for Pilot Crushtec

### REGULARS

### MINING NEWS

4 Debswana and Huawei unveil world's smart diamond mine project

IAMGOLD appoints new CEO and CFO

RBM's response to illegal activity affecting the business

5 MCSA welcomes Dr Ramokgopa as SA's new Minister of Electricity

Altona Rare Earths' proposed admission to main market

6 Contango Holdings completes pilot coke plant at Lulu Project

Resolute achieves exploration success

7 Local businesses complete R40m expansion at Impala Rustenburg's 16 Shaft

Orezone closes C\$16.5 million private placement

### COLUMN : ROSS HARVEY

38 South Africa's mining underperformance is bad for everyone

### SUPPLY CHAIN NEWS

40 Hitachi Construction Machinery begins parts remanufacturing in SA

Condra manufactures unique suspension crane

OTRACO gains Level 1B-BBEE accreditation



### ON THE COVER

Enaex remains steadfast in its vision of expanding its African footprint, says Enaex Africa CEO Francisco Baudrand. See story on page 8.

# Sinking or sunk?

Is the appointment of Dr Kgosisentsho Ramokgopa as the minister responsible for electricity in the Presidency, “to guide the country out of the electricity crisis”, a little too late or is there still opportunity to save this sinking ship?

According to the Minerals Council South Africa, the appointment of Dr Ramokgopa is a good one.

The Minerals Council’s members and the private sector have more than 9 GW of renewable energy projects, worth more than R160 billion, that can be built in the next five years and which will help take the pressure off Eskom so it can conduct its critical maintenance programmes and restore its aging fleet of power plants to stability.

The council said it looked forward to working with Dr Ramokgopa to expedite these projects, removing red tape and bottle necks, including strengthening the transmission infrastructure, which is vital to unlocking the private sector’s contribution to resolving the crisis.

Meanwhile, the latest data from Statistics South Africa on the country’s gross domestic results show that GDP declined in the fourth quarter of last year. After rallying in the third quarter of 2022, GDP declined by 1,3% in the fourth quarter (October-December).

According to StatsSA, growth was dragged lower mainly by finance, trade, mining, agriculture, manufacturing and general government services.

Seven of the ten industries contracted in the fourth quarter, with the finance, real estate & business services industry shrinking by 2,3%. As the finance, real estate & business services industry is the largest in the South African economy, the 2,3% decrease was the biggest factor behind the decline in GDP.

Output from the mining sector, which has long been a saviour to the economy, was dragged lower by a decline in the production of diamonds, iron ore and PGMs.

Economic activity in the electricity, gas & water supply industry was hampered by lower levels of production and consumption of electricity (mainly due to load shedding) and water, StatsSA said.

For more insight on the impact of the economy’s underperformance, turn to page 38 for Ross

Harvey’s column entitled: *South Africa’s mining underperformance is bad for everyone.*

## In this edition

Copper, a key metal in the green transition, is a focus in this edition. Modern metals company, Lifezone highlights progress on its Kabanga Project, an exploration-stage high grade nickel, copper and cobalt project in Tanzania and flags the strides it is making in commercialising its patented hydrometallurgical (Hydromet) processing technology (pg 16).

According to Liberum, although copper had a sensational start in 2023, trading at a high of over US\$9 000/t, the company expects demand to be subdued next year, with copper tracking around US\$7 000/t by 2024 (pg 12).

Meanwhile, South African-based engineering and mining contractor, Murray & Roberts Cementation recently achieved a milestone on the Palabora shaft sinking contract, reaching a depth of 800 m – a significant landmark as this represents two thirds of the final depth of 1 200 m. The shaft forms an integral part of the company’s Lift II project, a new mining block that will eventually replace Lift I and extend the mine’s life by more than 15 years (pg 20). Palabora is the country’s single *producer of refined copper*, supplying the local market with 85% of its copper requirements.

This edition also features innovation and technology with mobile telecommunications company, MTN, highlighting its expertise in telecommunications and technology and sharing how it is assisting to transform the mining industry and aiding in unlocking new opportunities for growth and innovation (pg 30).

Further to this, VoltVision, a company that transforms raw power data into actionable information, advises on its African strategy and flags some success stories (pg 32) while petrochemicals giant Shell has new tools and products to help miner’s lower their carbon footprint (pg 34).

Enaex, the world’s third-largest explosives company, remains steadfast in its vision of significantly growing its African footprint, says Enaex Africa CEO Francisco Baudrand in our cover story on page 8. ■



Nellie Moodley

**Editor:** Nellie Moodley  
e-mail: mining@crowm.co.za  
**Advertising Manager:** Rynette Joubert  
e-mail: rynettej@crowm.co.za  
**Design & Layout:** Darryl James  
**Publisher:** Karen Grant  
**Deputy Publisher:** Wilhelm du Plessis

**Circulation:** Brenda Grossmann and Shaun Smith  
**Published monthly by:** Crown Publications (Pty) Ltd  
P O Box 140, Bedfordview, 2008  
Tel: (+27 11) 622-4770  
Fax: (+27 11) 615-6108  
e-mail: mining@crowm.co.za  
www.modernminingmagazine.co.za

**Printed by:** Tandym Print

The views expressed in this publication are not necessarily those of the editor or the publisher.



Average circulation  
October-December 2022: 13 634



# Expect **more** sustainability

Solving the challenge of scrap tyres in a way that's practical and sustainable could be around the corner for Southern Africa. After successfully opening a thermal conversion OR tyre recycling facility in Chile that converts scrap tyres into base elements for reuse, Kal Tire is ready to bring this scalable solution to other regions.

## Debswana and Huawei unveil world's smart diamond mine project

Diamond producer, Debswana, and information and communications technology provider, Huawei, recently unveiled the world's first 5G-oriented smart diamond mine project at MWC Barcelona 2023.

The Huawei-enabled smart mine solution has been deployed at Debswana's Jwaneng open-pit diamond mine, and started operation in December 2021.

As Debswana's head of information

management, Molemisi Nelson Sechaba pointed out, Huawei's 4G eLTE private network solution provides stable connectivity for the Jwaneng mine, connecting more than 260 pieces of equipment, including drilling rigs, excavators, heavy trucks, and pickup trucks. This enables interconnection between the mine's production, safety, and security systems.

Sechaba said that it was important to deploy the eLTE solution to connect mining equipment in a more stable manner. There are two reasons for this and the first is efficiency. The ability to transfer data in real time makes equipment such as mining vehicles more efficient, increasing yield and reducing long-term OPEX. Secondly, the solution helps improve safety. Real-time data collection, backhaul, and interaction make the system more sensitive and accurate, ensuring that it provides more reliable protection for staff and vehicles.

The Jwaneng mine is the world's first 5G-oriented smart diamond mine. This means the hardware equipment such as base stations used in the mine's digital

transformation solution support network upgrades to 5G.

5G features such as high bandwidth and low latency can support the application of cutting-edge technologies like autonomous driving, enabling more intelligent digital transformation of the mining industry in the future.

Liao Yong, vice president of Huawei sub-Saharan Africa region, said that mining is the economic backbone for many sub-Saharan African countries and plays an important role in the economy of Africa as a whole. Over the past five years, Huawei has provided services to mining enterprises in a number of countries in the region, including South Africa, Botswana, Zambia, Namibia and Ghana. Looking to the future, Huawei will work with more local partners to accelerate mining digital transformation and create more value in Africa.

Following on the success of the Jwaneng mine project, Debswana plans to deploy the smart mining solution in its Orapa, Damtshaa, and Letlhakane mines in 2023. ■



Liao Yong, vice president of Huawei sub-Saharan Africa Region.

### IAMGOLD appoints new CEO and CFO

Gold miner, IAMGOLD, has appointed Renaud Adams as the company's CEO, effective April 3, 2023 and Maarten Theunissen as its CFO.



"The appointment of Adams represents the culmination of an extensive and rigorous search process led by the board's CEO search committee," said Maryse Bélanger, chair of the board. "Renaud Adams offers the rare combination of operational, strategic and capital markets experience, with a proven track record of leading a safety-first culture, attributes that are essential for leading a global mining company today. The entire board looks forward to working with Renaud as he provides the leadership to guide IAMGOLD towards its goal of becoming a leading high-margin gold producer. Further, we are pleased to appoint Maarten Theunissen as CFO on a permanent basis. During his brief tenure as Interim CFO, he quickly became an integral part of the executive management team and was instrumental in helping the company achieve its funding goals to complete the construction of Côté," Bélanger said. ■

### RMB's business affected by illegal activity

Heavy mineral sands miner, Richards Bay Minerals (RBM), has been subjected to criminal activity affecting its business, including the theft of product. In response, RBM has significantly strengthened its internal controls with the aim of stopping further potential for illegal activity occurring within the business. "RBM has commenced initial civil legal proceedings against certain parties we believe have benefited from the theft of product from RBM and in

the Richards Bay area. The South African Police Service (SAPS) is also undertaking an investigation. RBM is grateful for the work of the SAPS, who have investigated alleged criminal activity causing harm to RBM's business, and contributing to instability in the region. The work of the SAPS and our own investigation have highlighted activities that have had a significant detrimental impact on RBM," the company said in a statement. ■



RBM has been subjected to criminal activity affecting its business.

## MCSA welcomes Dr Ramokgopa as SA's new Minister of Electricity

The Minerals Council South Africa has welcomed the appointment of Dr Kgosiensho Ramokgopa as the minister responsible for electricity in the Presidency to guide the country out of its electricity crisis in partnership with the private sector. "The appointment of Dr Ramokgopa is a good appointment. The Minerals Council has worked with him in the past and we look forward to working with him to help resolve South Africa's electricity crisis. It is important that other components of government align with the presidency to achieve the objectives of the electricity recovery plan," says Roger Baxter, CEO of the Minerals Council.

The Minerals Council's members and the private sector have more than 9 GW of renewable energy projects worth more than R160 billion that can be built in the next five years, taking pressure off Eskom



There are more than 9 GW of renewable energy projects that can be built in the next five years.

so it can conduct its critical maintenance programmes and restore its aging fleet of power plants to stability. "We look forward to working with Dr Ramokgopa to expedite these projects, removing all red

tape and bottle necks, including strengthening the transmission infrastructure which is vital to unlocking the private sector's contribution to resolving the crisis," says Baxter. ■

## Altona Rare Earths' proposed admission to main market

Altona Rare Earths, a mining exploration company focused on the development of a significant Rare Earth Elements (REE) mining project in Africa, has raised £2 million via a share offering. The company was seeking to raise £1.25 million in new capital.

The fundraise is conditional on the proposed admission of its entire ordinary share capital to the official list and to trading on the London Stock Exchange's Main Market for listed securities.

The intended use of funds will include

the completion of Altona's maiden JORC compliant mineral resource estimate and a scoping study for the company's flagship asset, Monte Muambe Rare Earths mining project, in northwest Mozambique, which is expected to be published in May 2023. This will enable the company to increase its holding in Monte Muambe Mining Lda (which owns 100% of Monte Muambe) from 20% to 51%. The funds will also be used to repay certain creditors and for general working capital purposes. ■



Altona Rare Earths is busy developing its Monte Muambe Rare Earths project.




Experience Sentry in action  
at DRC Mining Week,  
June 14-16, Maptek Booth (B18-19).

**Mobile monitoring system for ground movements, rockfall and slope stability**

Improve safety and reduce operational risk  
Manage rockfalls in near real-time  
Run periodic, routine or continuous monitoring

Limit risk and maximise safety. Request a demo today!  
[www.maptek.com](http://www.maptek.com) | [info@maptek.co.za](mailto:info@maptek.co.za) | +27 11 750 9660



## Contango Holdings completes pilot coke plant at Lubu Project

London listed natural resource development company, Contango Holdings, has completed construction of a small-scale coke battery at the Lubu Coal Project in Zimbabwe. The pilot plant has been constructed to provide on-site capability to manufacture coke from washed coking coal produced at Lubu for testing by future offtake partners and for the company's internal studies and quality control. The ultimate coke batteries to be installed at Lubu for future production and sales will be considerably larger and a different specification, the company said.

To date, the manufacture of coke and subsequent studies from washed coking coal from Lubu has taken place remotely, with highly encouraging results. The ability to manufacture coke on site is a significant

step, providing accurate field results, a crucial step in securing partners in the company's coke manufacturing strategy.

Following completion of the pilot plant in February 2023, the company has subsequently produced around four tonnes of coke, from a sample of washed coking coal from Lubu. A significant portion of this production will be delivered to the multinational company that entered into a MoU with Contango in December 2022. This is part of the ongoing due diligence process to confirm suitability for their requirements ahead of a potential transaction.

Carl Esprey, CEO of Contango, commented: "Whilst the expected margins on our coking coal production are very attractive, we have always maintained that the highest margin business stems from the



Final coke product.

manufacture of coke at Lubu. Accordingly, we have already completed numerous small-scale tests remotely to assess the coke characteristics from Lubu, with highly encouraging results.

The completion of the pilot coke plant will now enable us to generate larger coke production for testing, something required to enable us to conclude discussions under our MOU and, as required, provide additional samples to other parties who have expressed interest in coke produced from Lubu." ■



Stacked coking ovens 'cooking' the coal at 900-1100°C.

## Resolute Mining achieves exploration success

Dual-listed Resolute Mining has announced the company's Annual Ore Reserve and Mineral Resource statement at 31 December 2022. Ore Reserves have increased to 4.6 moz of gold and Mineral Resources have increased to 11.2 moz of gold after accounting for the effects of mining depletion, improved productivities underground and exploration success.

At 31 December 2022, Resolute's direct share of Ore Reserves was 3.8 moz and Mineral Resources, 9.1 moz. The exploration success at Syama North has added 2 million ounces of gold to the mineral resource this year and 850 000 oz to the ore reserve all tonnes.

Resolute's CEO Terry Holohan, commented: "The continued success of the drilling programme at Syama North over the second half of 2022 exceeded expectations. The drill rigs are still turning on this contiguous strike discovery of over 6 km which remains open at depth. At this stage, the 850 koz of Syama North ore reserves focus only on the widest sections of the A21 pit, thus we expect further updates later this year as in-fill drilling continues delineating

additional economic mineralisation. It is also worth noting that the 10% oxides delineated at Syama North now represent some of the highest grades of oxides at Syama, such that they will get processing preference once mining starts in earnest." ■



Resolute achieves exploration success.

## Local businesses complete R40m expansion at Impala Rustenburg's 16 Shaft

Platinum miner, Impala Rustenburg, invested just over R40 million to expand the facilities areas at its 16 Shaft operation. This is to accommodate the company's growth over the past few years, which has seen an additional 2 000 people employed by the platinum group metals producer.

The expansion includes modern offices, a change house and lamp room facilities, which will contribute to improving 16 Shaft's morale, culture, efficiency and productivity.

The project was completed in partnership with Mmakgoge Group, a women-owned mine-community SMME from Kanana. Local



CEO Mark Munroe at the ribbon cutting.



Impala Rustenburg operations.

sub-contractors from mine-host communities were also employed for the project, further benefitting Impala Rustenburg's communities. The project involved at least 110 employees on site, and the ad hoc use of local sub-contractors. Mark Munroe, chief executive at Impala Rustenburg said: "This investment in our operations improves our efficiency and created opportunities for the communities around us. We remain committed to providing safe, sustainable and value-adding mining practices while also investing in the local business community to ultimately create a better future for all our stakeholders." ■

## Orezone closes C\$16.5 million private placement

TSX-listed Orezone Gold Corporation has announced the completion of 13 million common shares at a share price of C\$1.27 for gross proceeds of C\$16 510,000. The offering was arranged with a large and well-established institutional fund, the company said.

The net proceeds of the offering will be used to advance several strategic initiatives, including accelerated project development at Bomboré ahead of the Phase II sulphide expansion; additional targeted exploration drilling; and advancement of Orezone's cor-

porate growth strategy in the region.

Orezone is focusing on mining and processing the Phase I near surface free-dig oxides at a planned annual throughput of 5.2 million tonnes. The company believes that Bomboré has a significant underlying sulphide resource to support a substantially larger Phase II expansion. The company has recently completed a resource definition drill programme, and plans to issue an updated mineral resource, reserve and life of mine plan, as part of this Phase II expansion. It is expected that the pending study



Orezone has raised funds to advance several strategic initiatives.

will be completed in Q3-2023 to be followed by a production decision. ■



Your uptime partner

See how our machines and services can help you be successful at  
<https://mining.komatsu/en-za/room-and-pillar>

**KOMATSU** 

12 Commercial Road, Wadeville, Germiston | Tel. +27 11 872 4000



# Enaex targets Southern African market, eyes

Santiago Stock Exchange listed explosives manufacturer, Enaex – the world’s third-largest explosives company, founded in Chile more than 100 years ago – remains steadfast in its vision of expanding its African footprint, Enaex Africa CEO Francisco Baudrand tells *Modern Mining*.

**F**or Enaex, a company with manufacturing plants in eight countries, including South Africa, USA, France, Australia, Chile, Peru and Brazil, Africa is a key part of its strategic growth plan; but it was only in 2016, aligned with its vision of becoming the preferred explosives supplier in the world’s top mining regions, that establishing a footprint in resource-rich Africa became Enaex group’s target.

Enaex Africa was established on 1 July 2020 through a joint venture with petrochemicals giant, Sasol and Afris. In 2017, Sasol commenced a detailed asset review where the explosives business was identified as having substantial growth potential that could be unlocked through partnering with a world-class explosives brand. In June 2019, after a stringent evaluation process, Enaex S.A. was selected as Sasol’s preferred strategic partner to build a joint venture. Since July 2020, the new organisation has been conducting business under the name Enaex Africa.

“As Africa is a mining region with massive growth potential, we identified South Africa as the ideal gateway into the rest of the continent. In fact, we were fortunate in that just after we made the decision to enter the African market, Sasol, which established its explosives business in 1984, was considering divesting from it. Enaex inked the partnership with Sasol in November 2019 and began operating as Enaex Africa in July 2020,” says Francisco Baudrand.

Over the past two-and-a-half years, Enaex Africa



has grown considerably, becoming one of the most important subsidiaries for the group.

The explosives manufacturer, which has an established presence at mines in South Africa, Namibia, Lesotho and Botswana, and is beginning operations in Zambia, remains upbeat about growth opportunities, anticipating new business to come to fruition this year.

“Enaex Africa is one of the top three explosives manufacturers in South Africa and, aside from focusing on local opportunities, we are also on a growth trajectory outside of South Africa,” Baudrand says.

Although the company is focused on growing its Southern African footprint in the short term; its

*“As Africa is a mining region with massive growth potential, we identified South Africa as the ideal gateway into the rest of the continent,” says Francisco Baudrand.*

First Day of Enaex Africa.



# West Africa



medium to long-term strategy sees the explosives manufacturer firmly set on expanding its footprint to the West African market, which is an important source of gold, cobalt, copper, diamonds and rare earth metals. The region is also rich in aluminium, nickel, phosphate, manganese and zinc, among others.

With its growth aspirations tied to resource rich African countries that offer political stability, Enaex Africa's strategy is to partner with local entities, that can add value to the business, in identified target countries.

"However," explains Baudrand, "if we don't feel comfortable with the level of political and economic stability in a particular country, we may choose to trade product instead of establishing an in-country subsidiary, given we would like our shareholders to be comfortable in the areas in which we operate."

In 2021, the company established a subsidiary with a local partner in Botswana. The short-term objective is to grow and become the leading explosives supplier in that country. The same strategy of partnering with locals, has been considered in Zambia for the new venture.

However, underpinning the BBBEE Level 2 certified company's growth strategy, is its focus on improving its safety record.

According to Baudrand, the company is aligned with meeting and surpassing its safety record. "We have improved our safety record significantly from 2021 to 2022, including decreasing our lost time injury frequency rate by 80% and always putting safety first in everything that we do," he says.



## Delivering innovative solutions to the mining sector

According to Baudrand, the Enaex group is leading the way in innovations related to teleoperated mines and is pioneering robotics in blasting. It has, since 2019, been offering remotely operated robotic solutions. Enaex's purpose is to "humanise mining" by improving mining complex working conditions and decreasing risk to employees on-site. The main focus of the robotic innovations is to achieve three objectives namely:

- ❑ Reduce exposure to risk to our employees, improve working conditions and ultimately enhance their life quality.
- ❑ To offer a solution for high-risk operations, always seeking to improve people's safety levels, by taking them out of the danger. This will make mining resources viable where, given the level of risk, a traditional operation is precluded.
- ❑ To implement remote and automated operations, modernise the traditional mining method, generate a technological leap, and advance productivity.

"We have completed the development of the first

Above: Enaex undertaking blasting at Grootegeluk mine.

Left: Prillex Plant in Chile - largest explosives-grade ammonium nitrate production complex in the world.

*"If we don't feel comfortable with the level of political and economic stability in a particular country, we may choose to trade product instead of establishing an in-country subsidiary, given we would like our shareholders to be comfortable in the areas in which we operate," explains Baudrand*

Enaex MMU's in operation at Manungo Mine.





Bulk Emulsions plant in Secunda.

100% teleoperated trial, in an underground mine, in Chile. In terms of technology related to opencast mines, Enaex has successfully implemented the first teleoperated explosives pumping truck MMU (mobile mixing unit) at some mines in Chile. The MMU can now be teleoperated 1 km away from the mine to load the blasting holes with explosives,” says Baudrand.

The first teleoperated MMU was pioneered at Anglo American’s *Los Bronces* mine in Chile, with the explosives manufacturer now aiming to bring the technology to local mines.

Further to this, Enaex is busy with explosives innovations targeting the coal mining industry, which remains challenged by the high temperatures of underground burning coal. The company recently developed a bulk emulsion solution able to resist hot holes, with temperatures of up to 150 degrees Celsius.

“The blasting process in South Africa’s coal mines with hot holes is a real challenge as the temperatures in the holes exceed 130° C. This creates a risk of unplanned detonation when the product is pumped into the hole. By adopting Enaex’s innovative bulk emulsion solution, the customer is able to load more holes in a drilling pattern as the product can handle higher temperature requirements, which translates to better blasting and larger blasting areas.” he explains.

Enaex and its African subsidiary are working closely to get the product into the market, expecting that it will be available during 2023.

Meanwhile, with ESG firmly on the agenda, the explosives supplier, which operates the world’s largest ammonium nitrate plant, is in the process of building a pilot plant to produce green ammonia. This will use hydrogen as an energy source, and the hydrogen will be produced using solar energy.

“Our ambition is to have the plant developed by 2030 and to ensure that all our



Enaex Africa’s focus is to reduce exposure to risk to its employees.



Enaex Africa busy at Royal Bafokeng’s underground operations.

green ammonia-related products are produced in-house,” says Baudrand.

### Enaex Africa sets the bar high

In line with enhancing female talent in the communities in which it operates, Enaex Africa rolled-out programmes aimed at increasing the number of women in the company. Considering that only 17% of the employees in the mining industry are women, there is a big opportunity here.

“In the explosives manufacturing space, we want to take the lead in encouraging and offering opportunities to women – in fact, we have initiated a programme to include newly graduated female engineers into our organisation. They will be trained and able to take up challenging roles within the next 18-24 months.”

Also, in support of rural mining communities, Enaex Africa is investing in a programme to improve the quality of the education for children between the ages of 10 months and five years. “We believe that investing in Early Childhood Education is crucial for children to learn to read in Primary School and hopefully become professionals one day. We have already invested in support of this initiative, in a pre-primary school of 90 children in the Steelpoort area of Limpopo, to upgrade infrastructure, upskill the teacher’s knowledge and include technology,” says Baudrand.

“We believe that when you touch the lives of children by providing them with the building blocks for development, you enhance their growth and play a key role in their future career paths,” concludes Baudrand. ■

## Enaex

- Enaex Africa produces and distributes a variety of explosives and value-added solutions, providing all the products required to execute the entire blasting process, including several types of bulk emulsions, cartridge emulsions, boosters and conventional and electronic detonators, among others.
- The products are used in blasting for opencast and underground mining operations, quarries and civil construction.
- Enaex Africa, which is headquartered in Sandton, has manufacturing sites in Secunda and Rustenburg; and regional offices in Northern Cape, Rustenburg, Witbank and Swakopmund (Namibia).
- The company also has subsidiaries in Namibia, Lesotho, Botswana and Zambia.



# Global Presence Local Touch

**Mining Explosives,  
Technologies &  
Blasting Services**

Enaex Africa is a premium blasting solution partner in all main mining regions, with a clear purpose to humanize mining. In Africa, Enaex produces and distributes a wide variety of explosives and value-added solutions, providing all the products and services required to execute the entire blasting process, including several types of bulk emulsions, package explosives, boosters, and conventional and electronic detonators, among others. These products are used in blasting for opencast and underground mining operations, quarries, and civil construction. Enaex is committed to embracing global and local sustainable development initiatives and have placed renewed focus on a safety, health and environment plan that reflects commitment to make sure our impact is – and will always be – a positive one. Enaex stands for Stronger Bonds - let's work together, grow together.

# Copper's prices rally, falter

By Tom Price, Head of Commodities Strategy at Liberum

Copper bulls have had a sensational start to 2023 as the metal's price has rallied 25% from its October-lows, to over US\$9 000/t- \$4.0/lb. This 12-week sustained lift occurred on the fading of two bearish global macro-policies – the end of China's strangely severe covid-related lockdown, and the slowing in the US Fed's aggressive rate hike policy – with some help from mine supply troubles. For now, copper's price rally has stalled – as the market awaits China's post-lockdown demand kick.

## China's recovery vs copper trade

Consuming over 12 mtpa of copper (52% of global total), China is the largest national consumer of this metal. Also, over 80% of China's copper supply is imported – making the trade an important global metal price driver.

While 2022's lockdown in China hit consumption hard, activity in its vast metal-processing industry remained relatively stable. It follows that we should not expect a particularly strong lift in China's copper import/conversion rates, since they are already close to normal levels now.

But what of China's copper demand? High-frequency industry signals for China's economy indicate a marked lift in China's credit liquidity, trade flows and production rates – early in 2023. Popular investor view is that this upswing in signals reflects a post-lockdown recovery response. However, it is more likely to be China's post-winter seasonal restock in play here, and that this is receiving some support from the post-lockdown recovery event. Any substantial growth stimulus would create upside risk to China's import demand and copper's global price.

Copper bulls have had a sensational start to 2023.



Tom Price: head of commodities strategy at Liberum.

## Importance of Fed policy

Since March 2022, the US Federal Reserve has been leading most other major central banks worldwide with a sustained lift in rates, to curb inflation. As commodities do not offer buyers and investors a yield, rising rates effectively increase the 'opportunity cost' of holding them. Basically, these investors can secure a better return on almost any other US\$-asset ex-commodities.

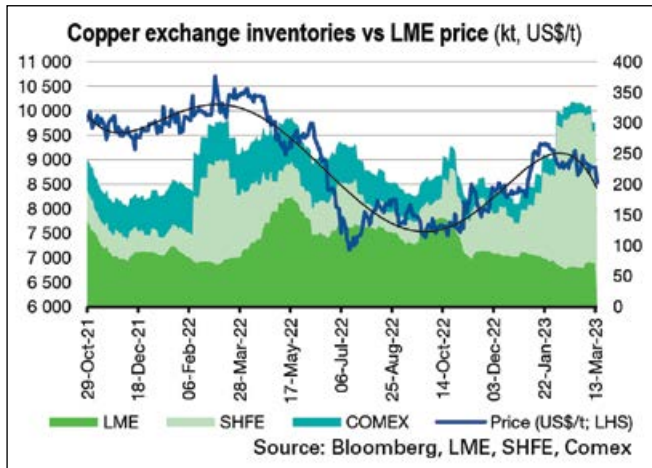
In fact, we are now convinced that most of the general decline in commodity prices during 2022 can be attributed to the US Fed's inflation-targeting cash rate policy – the policy effectively flushed out the speculators of mostly metal markets, including copper.

It follows that at year's end, when the Fed decided to moderate this policy, the speculators returned, knowing that buying commodity exposure carried reduced risk of a rate hike.

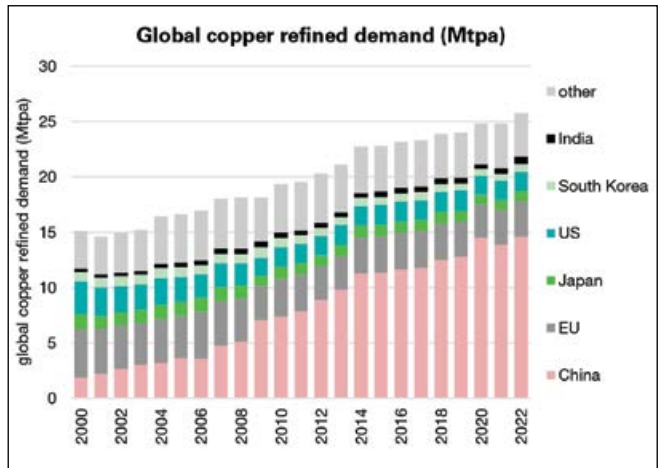
## Mine supply grief

Another bullish theme for copper this year has been the series of mining industry's supply-constraining





Copper price/inventory.



China's share of global demand.

issues: declining production rates in Chile, the largest source of exported metal; national protests in Peru; forced mine closure in Panama (now resolved), etc.

Chile's copper mining industry (25% of global mine supply; 2022 Cu production of 5.3 mt; 2023e, 5.5 mt) is reporting multiple pressure points: a decade-long drought (key input for processing); aging mines; declining grades; power supply issues; on-going uncertainty over Chile's constitutional reform. We forecast a perennial decline in Chile's production, despite Codelco's funding plans to underpin its own production rate over the coming decade (Codelco's 2022 output fell 10%YoY to 1.55 mt Cu).

In Peru, political conflict emerged last December, with nationwide protests agitating for the replacement of the new government and for ousting former president Castillo. The country reported a marginal decline in total copper output in January (12 mines; 2.4 mtpa contained Cu; 11% of global mine supply).

### Electrification vs. Conventional

Two key elements of a popular bullish copper investor view, are:

1. New EV driver: longer-term copper demand is underpinned by the emerging global EV sector (via harness; batteries; re-charge network).
2. Conventional end-uses stable: existing copper consumption rate, particularly in China, is at least broadly unchanged, into the long-term.

While EVs represent a new, important longer-term demand driver of copper, we remind investors not to regard the EV demand driver in isolation, but together with all other end-uses, particularly if there are possible changes in the growth rate of major, conventional demand.

For example, China's economy is now reporting an intensity of copper-use that corresponds with other major economies. Arguably, these data are broadly consistent with evidence that growth in China's infrastructure and property sectors (takes 45% of China's total copper supply) has stabilised in the past 4-7 years. It is likely that downside risk to

China's copper intensity-of-use is already building, despite the rise of EVs.

### Copper's price outlook? 2024 price floor

Even after copper's robust 25% rally from Oct-22's lows (spots US\$8,600/t-\$3.90/lb), we remain copper bears. We expect the US Fed's on-going inflation-targeting cash rate policy to cap speculator-led upside price risk during 2023.

Passing speculator interest in this metal market, together with subdued metal demand, should take copper's price to US\$7 000/t by 2024, at which point the hike cycle will be replaced by supportive fundamentals. Features of copper's medium-term demand outlook include stabilising growth in China, and the early stage of US infra-build.

Copper's longer-term fundamentals, beyond 2024, are price-supportive: mine supply growth is weak (source of 90% of all Cu units); China's on-going high dependency on imports (75% of total supply; feeding mainly into power sector; property) competing increasingly with the rest of the world's own demand, including on-going government-backed EV/recharge growth. ■

EVs represent a new, important longer-term demand driver of copper.





Trevor Raymond, CEO of the WPIC.

# Strong demand growth outstrips constrained supply

The World Platinum Investment Council (WPIC) recently published its Platinum Quarterly for the fourth quarter of 2022, full year 2022, and a revised forecast for 2023. After two years of significant surpluses the platinum market is forecast to move to a material deficit in 2023, the industry body said.



Platinum bar and coin demand are forecast to jump by 100% in 2023.

The change from the 776 koz surplus in 2022 to the forecast deficit of 556 koz in 2023 is over 1.3 moz. This reflects total supply remaining close to the weak level in 2022, up only 3% to 7 428 koz (+201 koz), and strong demand growth of 24% to 7 985 koz (+1 534 koz).

## Supply down 12% in 2022 and expected to remain weakened

Total supply was down in both Q4'22 (-18% year-on-year to 1 739 koz) and full year 2022 (-12% to 7 227 koz), as prevailing headwinds in both mining and recycling supply severely curtailed output.

For 2022, total mining supply declined 11% year-on-year (-659 koz) and is forecast to remain broadly flat in 2023 (+28 koz). Refined mine production in 2022 also declined 11% year-on-year (-718 koz) almost entirely due to lower output from South Africa. Output here declined 24% (-300 koz) year-on-year in Q4'22 as a result of smelter maintenance, operational challenges, and the impact of the country's well-documented electricity supply issues. Meanwhile, Russian production in Q4'22 declined 10% (-18 koz) year-on-year due to logistical challenges impacting the flow of material between Russian and Finnish processing facilities.

Global recycling in 2022 fell 17% year-on-year (-349 koz) on reduced availability of end-of-life vehicles and lower jewellery recycling. Autocatalyst



Platinum jewellery demand is set to increase as restrictions in China ease.

recycling declined because of new vehicles' low availability, meaning cars are being driven for longer. This was compounded by changes in consumer behaviour as a result of cost-of-living concerns and lower mileage due to remote working. Jewellery recycling was down, primarily due to slower jewellery sales in China impacting sell-backs. Global recycling is expected to recover by 10% in 2023 to 1 856 koz, driven by an increase in the availability of spent autocatalysts, with autocatalyst recycling forecast to recover by 12% to 1,391 koz.

*The global automotive market remained on an improving path during much of last year, showing resilience despite the lingering chip shortage, cost-of-living concerns, the impact of the Russia-Ukraine war, and the severe lockdown in China.*

The platinum market is forecast to move to a material deficit in 2023.



## Automotive demand growth trajectory continues into 2023

The global automotive market remained on an improving path during much of last year, showing resilience despite the lingering chip shortage, cost-of-living concerns, the impact of the Russia-Ukraine war, and the severe lockdown in China. Automotive demand for full year 2022 increased by 12% year-on-year (+311 koz), reaching 2,957 koz.

Despite vehicle production remaining short of pre-pandemic levels, a combination of factors is boosting platinum automotive demand growth. Firstly, in 2022, there was a 28% increase in the manufacture of hybrid vehicles, which typically require higher loadings in the aftertreatment system.

Secondly, tighter emissions legislation, particularly in China, also resulted in higher loadings (especially in heavy-duty diesel vehicles). Lastly, there was growing platinum for palladium substitution and, significantly, the increase has meant an upward revision to the substitution estimate by close to 100 koz, to 540 koz for 2023.

With these trends set to continue, global automotive demand is expected to increase by 10% in 2023 to 3,246 koz (+288 koz).

### Industrial demand in 2023 forecast to match the strongest on record

Industrial demand for platinum is expected to be an area of stand-out strength in 2023, up 12% year-on-year to 2,505 koz (+262 koz), and just 26 koz below the level in 2021, the strongest year on record. This strong demand growth will be driven by the construction of new LCD capacity installations in Japan and from China's project pipeline as the country's Covid-19 restrictions ease.

Within the glass industry, platinum demand will increase by 55% to 737 koz, offsetting modest declines forecast in the chemical (-2%), petroleum (-4%) and electronics (-6%) sectors.

### Jewellery demand set to increase as restrictions in China ease

With China, the largest platinum jewellery market, in lockdown for much of 2022, jewellery demand declined by 3% (-59 koz) to 1 894 koz for full year 2022. As restrictions ease, and consumer confidence returns, 2023 is forecast to see a 15% (+73 koz) demand increase in China.

Growth is also expected in Japan and in India. Meanwhile, declines are anticipated in Europe and North America on account of fewer weddings and recessionary fears. In all, global jewellery demand is expected to improve by 2% (+42 koz), growing to 1 936 koz in 2023.

### Investment demand recovery forecast in 2023 – improving by over 900 koz

Investment demand is expected to improve significantly in 2023. Platinum bar and coin demand is forecast to jump by 100% to 450 koz in 2023, a three-year high, reflecting improved product availability in North America and Europe and net disinvestment in Japan swinging to net investment.

Meanwhile, outflows in ETFs (-132 koz) and exchange stocks (-20 koz) will continue to slow, with some renewed interest in South Africa for platinum ETFs in preference to mining equities. The result will mean net investment demand of 298 koz in 2023.

Trevor Raymond, CEO of the World Platinum Investment Council, commented: "From a macro perspective, 2023 is expected to be a difficult year, with an uncertain economic environment, inflationary headwinds, and a global energy crisis. And yet, going



against the grain, the platinum market is forecast to be in deficit after two consecutive years of significant surpluses. This year's forecast deficit is unlikely to be a one-off, either, with challenges to supply expected to continue and future demand growth, supported by the needs of the hydrogen economy, likely to result in deficits continuing for a number of years.

Although power supply risks and operational challenges are included in forecast mining supply for 2023, a worsening of electricity supply shortages in major producer South Africa or sanctions-related operating challenges in Russia present downside risks to supply. In contrast, although demand forecasts include the negative impact of inflation and lower global economic growth, their downside is well protected. Here, strong demand growth results mainly from ongoing platinum for palladium substitution in automotive applications, already committed glass capacity additions, robust bar and coin demand, and the significant outflows from ETFs and exchange stocks having largely run their course.

Since 2021, we have observed the massive platinum imports into China – which were far in excess of identified demand – much of which have not been captured by our published data. Whether this will reflect actual demand – as we are seeing with the glass capacity expansions in 2023 identified in the recent report – or stock held in China, it may not be available to re-enter Western markets to address the deficit in 2023 due to domestic export controls, and so will lead to further market tightening.

Looking beyond the quarterly report we continue to highlight the strong link between platinum and the hydrogen economy. While hydrogen-related platinum demand is relatively small, it is expected to grow substantially in the medium term; as hydrogen demand becomes meaningful platinum could become a proxy for investors looking for exposure to hydrogen. An emergent new end source of demand for a commodity is a relatively rare occurrence and somewhat unique to platinum at this point in time, which only strengthens the investment case for platinum, particularly in a deficit market". ■

Strong demand growth outstrips constrained supply.

*With China, the largest platinum jewellery market, in lockdown for much of 2022, jewellery demand declined by 3% (-59 koz) to 1 894 koz for full year 2022. As restrictions ease, and consumer confidence returns, 2023 is forecast to see a 15% (+73 koz) demand increase in China.*

# Lifezone Metals unlocks opportunities for the

Modern metals company Lifezone Metals has a majority interest in the Kabanga Project, an exploration-stage initiative located in north-west Tanzania. It comprises one of the world's largest and highest-grade nickel sulfide deposits and is fast gaining traction as the world clamours for more nickel to feed the clean energy frenzy. *By Nelendhre Moodley.*



BHP recently invested \$50 million for an increased stake in the project.

**T**he clean energy drive, underpinned by the global push for a lower carbon footprint, is seeing an uptake of clean energy solutions, which in turn is driving demand for energy metals such as cobalt, nickel, platinum group metals and copper.

According to logistics and supply chain solutions provider, Fitch Solutions, global annual nickel production is set to reach 3.15 mn tonnes (mt) by 2031, up from 2.24 mt in 2021.

Battery-grade Class 1 nickel is set to experience a



major demand boost from the green transition, with the main supply risk and impediment facing battery players being sufficient Class 1 supply.

The Kabanga project will be a mine-to-metal mining operation producing high-purity nickel, copper and cobalt, with the company targeting manufacturers in the automotive and battery space.

Lifezone Metals CEO, Chris Showalter, explains that the company's strategy is to unlock and secure world class deposits of metals, and to license its patented technologies. "These are essential to clean energy and GHG emissions reductions as the world

Kabanga drill site.



# green economy



combats climate change. We are also building a scalable, low-emission processing solution that will set new standards in metal production.”

According to Showalter, the company has made significant progress over the past few months, including developments related to its partnership with leading global mining company BHP, which invested \$50 million for an increased stake in the project. BHP’s direct equity interest in Kabanga Nickel Limited (Kabanga Nickel) increased from 8.9% to 17%.

The new tranche of funding follows BHP’s initial investment of US\$40 million for an 8.9% equity interest in Kabanga Nickel, announced on 10 January 2022. With the initial tranche, BHP provided a US\$10 million equity investment to progress Lifezone Metals’ patented hydrometallurgical (hydromet) processing technology. BHP also has an option to further increase its direct equity interest in Kabanga Nickel to 60.7%.

Meanwhile, in line with its strategy of taking the project up the value curve, Lifezone Metals appointed Gerick Mouton as its chief operating officer in January this year. Mouton, a mechanical engineer and professional project manager with 25 years experience in strategic mining and mineral processing development, capital raising and execution of multifaceted capital-intensive mining and mineral projects, was identified as an ideal candidate to take the project up the value curve and into production.

## Bringing Kabanga Nickel Project into production

Established in 2022 on the back of the development of its innovative hydromet technology, Lifezone Metals acquired the Kabanga nickel project in 2021.

With more than \$293 million already spent by prior owners Glencore and Barrick to accurately delineate the ore body, Kabanga’s updated feasibility study can be produced on an accelerated timeframe.

Initiatives around the Kabanga nickel project are currently focused on drilling aimed at firming up the resource.

Earlier this year, Lifezone reported the publication of a Technical Report Summary that highlighted a total resource attributable to Lifezone of 40.4 mt, including contained metal of 2 925 mlb NiEq<sub>23</sub> grading at 3.28%, 2,325 mlb nickel grading at 2.61%, 311 mlb copper grading at 0.35% and 171 mlb cobalt grading at 0.19%.

Showalter explains that the publication of the technical report summary for the Kabanga project is an important step forward in the development of the project. “Drilling and test work on the Kabanga project continue as we increase our understanding of what we believe is one of the world’s most important new sources of sulfide nickel supply for global battery metals markets,” he says.

“We believe Lifezone Metals’ proprietary hydrometallurgical processing technology is key to unlocking the value of the Kabanga project and the

Lifezone Metals has a majority stake in the Kabanga Project.

## Hydromet technology

The hydromet technology is a hydrometallurgical alternative to smelting of concentrates, ores or residues containing precious, rare and/or base metals, such as nickel, copper and cobalt.



Drilling and test work on the Kabanga project continues.

potential to significantly reduce carbon emissions in battery metals refining compared to traditional smelting and refining – ultimately contributing to the production of cleaner battery metals.”

The drilling programme includes the resource definition drilling on the North and Tembo portions of the Kabanga orebody to support the geological resource model and mine planning for the definitive feasibility study.

More recently, Tembo Nickel Corporation signed a MoU with Tanzania Electric Supply Company for the supply of electricity to the Kabanga project and the Kahama refinery.

Showalter adds that the definitive feasibility study has commenced for both the Kabanga mine and the Kahama base metals refinery and will determine the development requirements of the project, including capital and operating costs.

“Our current estimated annual production rate is 2.2 mtpa of feed producing around 220 ktpa of concentrate,” he says, adding, “we expect to be able to grow Kabanga’s expected life through exploration and drilling programmes to incorporate further resources into the operations at the

Kabanga site - drill core shed.



Kabanga project over time.

MTL Consulting has completed updates to the Kabanga Environmental Management Plan and registered it with the National Environment Management Council in Tanzania. The Kahama refinery Environmental and Social Impact Assessment studies have also been advanced, with detailed studies underway.

Planning for Kabanga’s early works programme is in progress and includes an aerodrome and internal roads infrastructure as well as early site works, such as camp upgrades.

Work with other key Tanzanian infrastructure providers is progressing, including discussions with Tanzania National Roads Agency regarding upgrades to support the planned transport of concentrate from the Kabanga mine to Kahama refinery.

### Technology

Having established the combined technology and Kabanga asset into one company in 2022 on the back of its hydromet technology, which was conceptualised in 1996 by founder Keith Liddell, Lifezone is now working on the full commercialisation of the technology, which is expected to come online in the next two to three years.

In fact, given the success of its revolutionary technology, the developer of cleaner battery metals recently inked an agreement with NYSE-listed GoGreen Investments, which will see the company become the first nickel resource and green technology company listed on the NYSE. Upon completion of the proposed transaction, the combined company will operate under the ‘Lifezone Metals’ name and be listed on the NYSE under the ticker symbol LZM.

According to Showalter, the hydromet technology uses less electricity, has competitive water consumption and produces lower greenhouse gas emissions than traditional metals smelting processes.

The proprietary processing technology has the potential to eliminate carbon-intensive smelting from nickel production while eliminating harmful sulphur dioxide emissions from the process altogether.

According to estimates of the US Department of

Energy's Advanced Research and Projects Agency-Energy, metals smelting is responsible for 7% of all global CO<sub>2</sub> emissions.

"We believe our hydromet technology also allows its users to recover higher amounts of metals than traditional smelting technology," says Showalter. "In addition, when compared to other hydrometallurgical processes, our hydromet technology does not use cyanide or release effluent into the environment. Further to this, we believe the technology requires less energy and has lower CO<sub>2</sub> emissions, and is not sensitive to the typical impurities in the feed that impact traditional smelters negatively."

In the case of feedstocks containing precious and base metals, the hydromet technology includes three basic sequential unit operations, all of which are proven and commonly used in the metallurgical industry and provide high recoveries of base metals and precious metals:

- ❑ Pressure oxidation to leach base metal sulfides.
- ❑ Thermal treatment of the sulphate leach residue, if required, to condition the relevant minerals.
- ❑ Atmospheric leaching of the relevant metals in chloride media. The metals are subsequently separated, purified and converted into final metal or other products. In the case of feedstocks containing base metals but negligible precious metals, pressure oxidation is used to leach base metal sulfides and the metals are subsequently separated, purified and converted into final metal or other products.

Hydromet technology treats low-grade as well as high-grade concentrates, and recovers both base and precious metals into separate product streams.

The final products from the base metals flow sheet may be London Metals Exchange (LME) A Grade copper cathode, LME Class 1 nickel cathode and cobalt rounds, and the final products in the PGM circuit will be refined platinum, palladium, rhodium and gold metal sponge powders.

Highlighting the success of the technology, Showalter points to Future Metals, an ASX and AIM listed PGM development company, as an example.

Future Metals is exploring the potential to further process its high-grade concentrate using a hydrometallurgical process to produce upgraded metal products. The company partnered with Lifezone Metals to further explore the amenability of using hydromet technology.

In February 2023, Future Metals announced that an initial assessment of the Lifezone hydromet technology suggested the technology would be a low capital flow sheet addition with significant operating and economic benefits.

Future Metals also announced that its Panton Project's very high grade PGM3E concentrate would allow for a small, low-capital process plant employing Lifezone's hydromet technology, which would significantly enhance the economics of the Panton



Project, located in the East Kimberley Region of Western Australia.

Kabanga core samples.

In addition to industry success, Lifezone Metals recently announced that as part of ongoing work to produce the definitive feasibility study for the Kabanga project, test results from the Kabanga nickel concentrate show it is amenable to processing using its hydromet technology with pressure oxidation (POX) leach extractions for non-optimised test results equal to and over Ni 98.5%.

This is good news for the company as it will enable its Kabanga project to unlock enhanced project economics.

### Lifezone Limited

Through its wholly owned subsidiary, Lifezone Limited, the company owns a family of patents for hydrometallurgical metal beneficiation.

"Lifezone Limited's business model is to own interests in and/or operate processing refineries that use its patented technology and accumulated IP and skills to economically beneficiate metals to produce refined products for sale with potentially significantly reduced carbon footprint and cost compared to traditional smelting and refining methods. These include the Kabanga hydromet technology, which is under development. Lifezone Limited also expects to generate income from consulting fees and the licensing of its proprietary technology to other parties in return for royalties," concludes Showalter. ■

## Lifezone Metals

Lifezone Metals is a modern metals company supporting the clean energy transition.

- ❑ An emerging supplier of responsibly-sourced, low-carbon and sulphur dioxide emission metals to the battery and EV markets.
- ❑ Lifezone Metals' hydromet technology has the potential to largely eliminate smelting, the most polluting phase of metals production, from the production process
- ❑ The company operates across mining and processing, with potential for hydromet to be used in metals recycling



## Milestone reached on Palabora shaft-sinking

The ventilation shaft being sunk by Murray & Roberts Cementation at Palabora Copper Mine has reached a depth of 800 m – a significant milestone as this represents two thirds of the final depth of 1 200 m. The mine is owned and operated by Palabora Mining Company (PMC).

The shaft, which has a diameter of 8.5 m (including the concrete lining), forms an integral part of PMC's Lift II project, a new mining block which will eventually replace Lift I and extend the mine's life by more than 15 years. Founded in 1956, PMC runs underground and surface operations and the extension of the life of the mine will increase shareholder value and sustain the jobs and livelihoods of the surrounding communities.

The scope of the contract encompasses only shaft sinking as no station construction or lateral development is required. Blind sinking is being undertaken to a depth of 1 190 m before a 10 m drop raise completes the shaft.

Originally an open-pit mine, Palabora – which is currently South Africa's only primary copper producer of any significance – moved, with the commissioning of Lift 1, to being an underground block cave operation in the early 2000s. The new block, Lift II, is being constructed 430 m below Lift I, and is already in the very early stages of production although Lift 1 remains the main source of ore.

Murray & Roberts Cementation's contract to sink the ventilation shaft was awarded in February 2019 and, according to Fred Durand, senior project

manager, should be fully complete by the end of the first quarter of 2024. "Current progress on the contract is good and we are regularly achieving 40 or more lined metres of advance every month," he says.

He adds that the excellent relationship between PMC and Murray & Roberts Cementation has been a highlight of the contract. "We work as partners and share a common vision for the project. They obviously engage strongly with us but they also respect our expertise when it comes to shaft sinking and we appreciate this."

The blind sinking method is being used to sink the shaft. "Studies undertaken prior to the project going out on tender looked at alternatives, such as raise-boring and slype-and-line, but ruled them out as ground conditions are not favourable for these methods," explains Jas Malherbe, Murray & Roberts Cementation's on-site project manager. "Blind sinking was the only real option available."

Malherbe, who was with PMC prior to joining Murray & Roberts Cementation to manage the vent shaft contract, says the project has been challenging because of the ground conditions. "The nature of the rock mass is such that blasting tends to produce large rocks, which are difficult and time-consuming



Above: A view showing the location of the ventilation shaft project at PMC.

Left: PMC's Lift II project, a new mining block which will eventually replace Lift I, will extend the mine's life by more than 15 years.

the lining requirements – is undertaken in two phases. During the lashing cycle (traditionally one of the riskiest tasks in shaft sinking), the operator, working from within the machine's protective cab, is the only worker at shaft bottom.

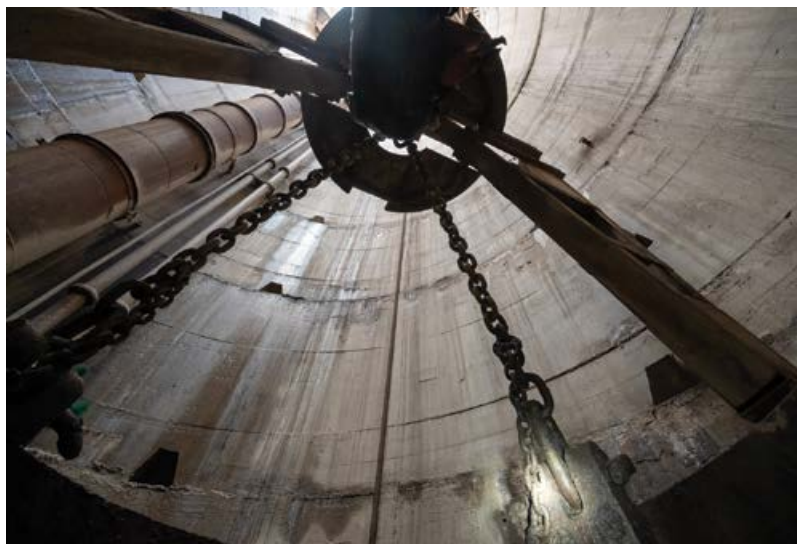
Within five minutes, the excavator can be equipped with a hydraulic breaker via a quick coupler to allow it to break up the bigger rocks prior to them being loaded into the 11-tonne kibble used to transport the blasted material to surface. Because there is no temporary support, the excavator also rakes the side walls after each blast to ensure that they are safe.

Unusual features of the project include the use of a self-contained emulsion machine – or 'pod' – which charges up the shaft bottom in preparation for blasting, and the use of slick lines, as opposed to kibbles, to deliver concrete to the shaft bottom from the batch plant on surface.

The concrete mix being used has been specially designed for the needs of the project. "The mix gives us 3 MPa within four hours which is essential given the way we've sequenced our operations," says Malherbe.

According to Malherbe, the methods being used at Palabora represent an adaptation of the Canadian shaft sinking method that Murray & Roberts Cementation pioneered in South Africa at its Venetia Underground Project (VUP) for De Beers.

Concrete lining of the 8.5 m diameter ventilation shaft.



## contract

to handle," he says. "However, careful attention to our blasting techniques has allowed us to manage the problem successfully."

He adds that the difficult ground conditions also resulted in Murray & Roberts Cementation taking the shaft lining right to the bottom of the shaft. "Consistent with conventional shaft sinking practice, we tendered on the basis of lining the shaft to within 12 to 18 m of shaft bottom and we envisaged using split sets and mesh as temporary support, but this did not prove effective," he explains.

"We therefore took the decision to dispense with temporary support and line right down to the blasted face. Some of our shaft-sinking veterans were doubtful that we could do this successfully, but we've proved them wrong!"

The key production machines deployed on the project are two twin-boom Komatsu jumbo drill rigs specially acquired for the contract, and which can be remotely operated. The jumbos are slung down the shaft from surface and nested in the four-deck stage for drilling the shaft bottom, a procedure that is repeated for each 48-hour blast-to-blast cycle, including a 3 m shaft concrete lining. Before each blast, the stage is raised to a safe position.

Another vital piece of equipment is a Komatsu excavator with a 0.3 m<sup>3</sup> bucket (roughly equivalent to a handling capacity of 750 kg). It is lowered from surface through the stage to shaft bottom and is used for lashing, a procedure which – to accommodate



An excavator busy lashing at the shaft bottom with shaft lining being carried out on the face.

The method, developed by Murray & Roberts' sister company in Canada, reduces the number of workers needed for shaft sinking operations and is regarded as being safer than traditional shaft sinking.

"The different conditions we face have led to some changes in the methodology – without any compromise on safety – but many elements remain the same, particularly in terms of the shuttering system," he says. "As was the case at VUP, we also use sling-down jumbos, the main difference being that our machines are electro-hydraulic rather than pneumatic-hydraulic."

The number of Murray & Roberts Cimentation personnel deployed per shift is 25. This figure includes all drivers, bank assistants, operators,

Murray & Roberts Cimentation achieved 500 LTI free hours on 1 July 2022.



surface engineering crew and assistants. In the shaft itself, there are normally only between seven and ten workers, including the miner and shaft boss. The total labour complement on site is currently just over 120 people, 46 % of whom are recruited from local communities.

Durand says that commitment to safety is non-negotiable with Visible Felt Leadership playing an important role. "We believe active and visible participation by managers and supervisors not only identifies and addresses potential issues but also goes a long way to building a culture of safety throughout the organisation."

Highlighting Murray & Roberts Cimentation's community and social initiatives on the contract, Durand says the company – working very closely with PMC – has concentrated primarily on assisting local schools. The facilities provided (to a value of near R2 million) have included ablution facilities, fences, water storage tanks and boreholes.

"We also have a training initiative underway, and this has seen young community members attending our Bentley Park Training Academy near Carletonville," he says. "Already, almost 80 individuals have completed the programme with a further 20 currently undergoing training. Although neither we nor PMC guarantee jobs to these youths, they are learning skills that are in high demand in the mining sector and could be life-changing for them."

Durand says the contribution that Murray & Roberts Cimentation is making to the communities surrounding the Palabora mine reflects the company's long-standing commitment to working in a socially responsible and sustainable manner. "Our company has a long record of engaging with and assisting local communities in the areas in which we work, and the Palabora contract is continuing this proud tradition".

Furthermore, PMC which is located within Phalaborwa in the Limpopo province in South Africa, is adjacent to the world-renowned Kruger National Park and the copper producer has initiated several wildlife management programmes to minimise the impact of its operations on the environment and to promote the harmonious co-existence of people, industry and wildlife. ■

**KREBS®**  
**millMAX-e™ Pumps**  
 Advanced slurry pump technology

For more info:  
 Scan the QR code

**ALWAYS  
ALWAYS  
ALWAYS**



The proven, trusted industry leader for unrivalled performance and innovation – always. When it comes to specifying your next pump or pump upgrade, it's not a question of whether you can afford Warman®, it's whether you can afford not to. [alwayswarman.weir](https://www.alwayswarman.weir)

Copyright© 2022, Weir Minerals Australia. All rights reserved.



**WEIR**

**Minerals**

# Atlas Copco and IPR affirm focus on customer applications

The partnership between global brand Atlas Copco and local dewatering pump specialist IPR breaks the mould by focusing on innovation and product development to meet specific customer needs.

Last year, IPR became the master distributor for Atlas Copco dewatering pumps in most of southern Africa. In a recent visit to IPR's headquarters in Johannesburg, senior Atlas Copco managers and IPR leadership explained to *Modern Mining* the significance of the IPR appointment, and outlined the strategy going forward. The partnership between Atlas Copco and IPR looks set to underpin an exciting growth phase in the dewatering pump segment for both companies.

Fauzi Belgharbia, Atlas Copco's General Manager Power Technique for Southern Africa, highlighted the growing role of the pump and flow products within the Atlas Copco offering, alongside its leading air compressor and generator ranges.

"Pumps have been identified as one of the most important pillars for strategic development within the business globally," said Belgharbia. "The international market for pumps is certainly very large, and our intention is to develop our market share."

With its product development experience going back more than 100 years, Atlas Copco designs and develops highly efficient and environment friendly dewatering pumps. This range includes wet prime and dry prime diesel driven pumps, as well as submersible pumps for the three key pumping categories – dewatering, sludge and slurry. The diesel driven pumps range in capacity from a 30 m to 150 m head, with flow rates from 50 to 1500 cubic metres per hour. The submersible range of Atlas Copco pumps extends from 0.4 kW to 54 kW power.

"We have excelled as an innovative solutions



Atlas Copco submersible pumps have an established reputation for reliable operation in harsh conditions.

provider, designing and manufacturing pumps that deliver optimal performance for customers at the lowest possible energy consumption and cost of ownership," said David Stanford, Atlas Copco's Business Line Manager Power Technique for Southern Africa. "We also want to be close to the customer, and the best strategy for doing this depends on where we are in the world; in Southern Africa, given IPR's considerable existing market footprint, we will leverage our relationship with IPR to achieve this."

IPR's master distributorship with Atlas Copco begins with a focus on eight countries: South Africa, Namibia, Botswana, Zimbabwe, Mozambique, Angola, Madagascar and Mauritius. While mining will be one of the leading markets for the dewatering range of pumps, other important sectors will be

Centre: The Atlas Copco range of dewatering pumps includes submersible and diesel driven skid and trailer mounted pumps.

Below: The PAC H boasts a number of features that help customers to reduce the cost of ownership through shorter repair times.



feature

construction, oil and gas, and agriculture.

Belgharbia emphasised that, in growing its local market, Atlas Copco wanted a partner that brought strong relationships within the market, and that shared its working culture and its passion for the dewatering business.

“IPR is therefore our ears and eyes in the market,” he said. “This means not only selling and servicing the Atlas Copco range of solutions, but also giving us the feedback we need to constantly improve our products.”

This is a significant aspect of the relationship, agreed IPR Managing Director Lee Vine, as IPR has extensive engineering expertise and insights developed over years in service of customers.

“Not only have we delivered a standard range of pump solutions in dewatering, dredging and hydro mining – but our skilled engineering team has also custom designed and manufactured bespoke solutions,” said Vine. “This gives us considerable insight into customer applications, and where the Atlas Copco range can add further value.”

Stanford concurred that the dewatering environment was dynamic, and needed a hands-on approach to identify opportunities where pumping solutions could be improved to better serve customer requirements.

“IPR and Atlas Copco both prioritise the need for detailed consultation with customers, to fully understand the nature of their challenges,” he said. “This is a vital aspect of identifying the right pump for the job – and we were impressed by the professional manner in which IPR undertakes these consultations.”

He highlighted that effective communication with customers formed the foundation of building firm relationships and reputable brands. This customer-centric approach ensures that the focus is on the particular application, rather than on the product.

“This makes it vital that we get quick feedback from our partners in the market – to make sure



IPR's new facility has a dedicated servicing and repair shop.



A global team from Atlas Copco held practical training sessions at IPR.

we understand what works best, and what needs improvement,” said Stanford. “This needs us to be ‘comfortable with the uncomfortable’ sometimes, to meet the requirements of the customer.”

Vine emphasised the technical expertise and market knowledge that IPR has developed since it launched in 2015.

“Our goal is to work with Atlas Copco as partners, bringing to the table our understanding of customers’ applications and challenges,” he said. “The collaboration with Atlas Copco is a perfect fit for us, and adds considerable value for our customer base.” ■

The Atlas Copco diesel driven skid mounted dewatering pump sets are available for sale or rent.



feature



Marnus Koorts, General Manager Pump Products at Weir Minerals Africa.

## Close linkages in pumps, valve range adds value to solutions

Customers benefit not only from the sheer range of pumps, valves and related equipment that Weir Minerals Africa offers, but from their careful integration – and the way they work together in process plants.

According to Marnus Koorts, general manager pump products at Weir Minerals Africa, the diversity of products in a single company's offering is only one contributor to successful solutions. As important is the fact that they interact with each other – and can all be considered in designing the optimal flowsheet.

"In a typical plant, the pumps and valves are within a few metres of each other – impacting directly on one another's performance, lifespan and total cost of ownership," explains Koorts. "A professional approach views all these items in relation to each other – that is, in an holistic way."

Over the years, Weir Minerals has made a concerted effort to ensure that its product portfolio comprises equipment lines that have a direct positive impact on each other in the working environment, he says. This has been an important aspect of the company's global strategy to develop its all-of-mine capabilities.

"With our pump range being among our core products, it is also important for us to understand how this equipment interacts with items immediately upstream or downstream in the flowsheet," he continues. "For instance, the selection and operation of pumps must take into account the adjacent pipework and the types of valves you use – as these all affect the friction factor at play in the arrangement."

Selection and operation of pumps must consider the selection of valves for optimum efficiency.

He highlights the impact of valves, bends and elbows on the net positive suction heads (NPSH) available and the pressure that needs to be produced on the discharge. All these factors must be included in the necessary calculations when choosing a pump. The type of valve being considered is integral to the selection of the pump.

Professionals and technicians at Weir Minerals spend much of their time developing pump systems with customers, often working closely with plant engineers during the planning and specification process. Among the layout decisions to be made are those relating to the positions of the valves and bends relative to the pumps.

"For instance, the customer needs to be aware that the distance between a valve and a pump must be at least one and a half times the diameter of the pump inlet – to avoid turbulence," he says. "This turbulence could have a negative effect on the pump's efficiency, and will also increase wear."

Not only does Weir Minerals understand the intricacies of the pumps and valves in its portfolio, it also offers the rubber bellows that can be installed between these pumps and valves. The bellows are useful in dealing with misalignment and with expansion in the pipework from changing temperatures. Importantly, they also help absorb startup or shutdown shock that could crack or break pipes.

"Our in-depth expertise on each of these products gives us insight into aspects like friction factors, which inform our recommendations on pump sizing and selection," says Koorts. "There is often not enough appreciation of the various issues to be considered in pump selection if the solution provider is not involved in all these different components."

In a recent installation, a customer required a third pump to be added to an existing two units in a sump on a large mineral processing plant in Africa. Weir Minerals Africa ensured that the third pump, a Warman® MCR was installed in a seamless integration that allowed the customer to operate any combination of the three pumps. Achieving this outcome, however, was far from simple and required a high level of expertise and planning.

"Using a dump valve in our design, we also enhanced the safety of the installation, so that several tonnes of slurry can be drained into the sump before any maintenance work on the pump



is conducted,” he says. “In addition to the dump valves, the solution involved isolation valves, Isogate Autoball check valves and an array of hoses – all making up a safe and flexible solution to facilitate an extra pump into the system.”

Underpinning these solutions are Weir Minerals Africa’s diverse skill sets to analyse and understand customers’ sites and requirements. The company’s engineers can conduct 3D scans of the working locations where equipment is required. This facilitates 3D modelling that the company’s engineering office can use to ensure optimal designs and layouts.

“When installing pumps, valves and associated equipment into existing plants, interfacing is one of the most challenging aspects,” he says. “Often the available plans are no longer accurate, so it is optimal to scan the whole area as a starting point.”

Having these spatial elements in the planning process is vital to inform decisions about where exactly the pumps can be located. In this project, Weir Minerals Africa’s hydraulic experts also used finite element analysis to visualise the flow and hydraulics inside the sump – to check for equal distribution to



all three pumps. The process is iterative, he explains, and requires close collaboration with the customer to achieve the best result.

“Our engineers need to interface the pumps, valves and pipework in ways that suit the customer’s priorities while optimising cost efficiency and performance,” he says. “The iterative process involves progressively more input – from our pumps team and engineering team to our valves team and pipes team.”

Projects like these showcase Weir Minerals Africa’s diversity of skills and products, he notes, which is enhanced by the close linkages between the different lines of equipment and their interaction in the process environment. ■

Above: Weir Minerals offers a wide range of pumps that integrate with valves and other mill circuit products produced by the company.

Left: A Warman mill circuit pump in operation at a customer site in Africa.

feature

## WE PROVIDE GIW® SLURRY PUMP SOLUTIONS



**Wear Resistant, High Performance -  
Locally manufactured.  
Global Quality Mining Pumps.**



KSB Pumps and Valves (Pty) Ltd • Tel: +27-11-876-5600

[www.ksb.com/en-za](http://www.ksb.com/en-za) • Level 1 B-BBEE Supplier



# Schurco Slurry – a partner in mining

Schurco Slurry is a heavy-duty centrifugal slurry pump manufacturer, dedicated to giving the end user a cost-effective solution; integrating the latest technology to meet and exceed customer's needs. The company recently celebrated its 48th birthday on the 1st of March 2023, with roots that date all the way back to 1975.

Schurco Slurry pump designs cover a wide range of applications with diverse materials, seals, and hydraulic performance for the most rigorous duties. Each pump series has distinct design features to deliver maximum performance, reliability, and longevity for a customer's particular application.

When purchasing a Schurco Slurry product, the customer receives a holistic service offering where its experts provide hands-on support. As an OEM, the company is able to provide full technical support and maintain a high level of inventory, resulting in major cost-saving benefits for its customers.

"Our robust materials are carefully tested and selected based on their ability to withstand the corrosive and abrasive nature of the substance being pumped, without the need for frequent maintenance. These pumps are specifically designed to handle the harsh conditions encountered in mining, such as high temperatures, high pressures, and heavy loads," the company said.

The Schurco U-Series is an unlined and cost-effective pump with a solid bowl metal wet-end, presenting a simple design for easy maintenance. These pumps present various metallurgical options and the large impeller diameters provide durability, strength, and long service life.

The Schurco Z-Series is perfect for dredging or large particle pumping, delivering extreme performance in large solids pumping applications offering exceptional NPSHr characteristics.

Schurco's business model is simple; it maintains a high level of inventory and delivers high-quality spare parts. Its streamlined procedures have resulted in optimised logistics, time-efficiency and cost-savings, delivering the lowest possible Total Cost of Ownership to its customers.

"Our passion is our drive to support our clients. Without passion, you don't have any energy, and without energy, you simply have nothing," says CEO, Emile Fourie. ■






**YOUR  
PARTNER  
IN MINING.**



+27 (0) 86 100 5386  
Sales.africa@schurcoslurry.com

# RMI's intensive testing supports high-pressure pump safety, quality globally

Mines and industry rely on critical high pressure pump technology to keep operations safe and efficient, which makes rigorous testing of this equipment an essential part of the manufacturing process.

According to Kathryn Poke, director of engineering at RMI Pressure Systems, dedicated test cells in the company's Manchester production facility support a range of technical tests to ensure final product quality. RMI Pressure Systems is a leader in high pressure and high-volume fluid pumping stations, with over a century's experience in designing, manufacturing and supporting this technology. With a primary manufacturing facility in the UK, the company has operations in China, the US, India and Australia – supporting equipment in countries around the globe.

Poke said that RMI Pressure Systems' quality and testing regime means new equipment and components can be put through as much as two million pump cycles – over periods of up to 160 hours – to prove their integrity.

"In robust and continuous applications such as longwall coal mining, our customers rely on our high pressure reciprocating pumps to deliver optimal uptime and safety," she said. "Similarly, our steel industry customers look for quality and reliability in de-scaling and forging applications."

In these demanding and often hazardous environments, pump pressures can reach 350 to 400 bar – making any leaks or defects potentially disastrous. She highlighted that RMI Pressure Systems' meticulous testing regime has been critical in building the company's quality reputation for over a century.

"Before delivery, all our equipment is put through its paces in our test cells," she explained. "These well-resourced facilities measure and record temperatures, pressures, speeds and other indicators – generating data that is carefully reviewed and analysed by our engineering team."

She emphasised that the test cells run alongside the company's manufacturing processes, which are accredited in terms of ISO9001 quality standards. This ensures that the extended periods of testing do not compromise RMI's production rates. The test facility can accommodate three RMI high pressure pumps at a time.

"This means that our customers are confident that RMI equipment is ready to go when it is installed and commissioned on site," said Poke. "There is no run-in time or bedding down to be done, so the



Above: RMI Pressure Systems' meticulous testing regime has been critical in building the company's quality reputation.



Left: Dedicated test cells in RMI Pressure System's production facility ensure final product quality.

pumps' contribution to productivity and uptime will be immediate."

Experts from RMI Pressure Systems are available to assist with installing and commissioning the equipment, giving customers peace of mind, and ensuring optimal performance. The company's manufacturing quality is also enhanced by its careful selection of suppliers and components; these are chosen for their excellence, and regular quality assurance processes are applied. Cycle testing of components is also conducted to ensure a quality finished product.

"Our inspection team tests new components extensively against the conformance criteria before giving it the thumbs up," she said. "Staying up to date with technology allows us to improve designs, software and materials of construction wherever possible; each improvement, though, needs to be thoroughly tested before we introduce it to the market." ■

## RMI

The company's manufacturing hub in Manchester, England, serves its operations in the UK, US, China, India, and Australia – as well as markets in Europe, the Middle East and Africa.



# Technology leading the mines of the future

By Vaughn Naidoo, Acting Executive: Centre of Excellence at MTN Business

**Of the billions of dollars invested into technology by miners over the past few years, a significant portion went into South African mining operations. This is creating new opportunities – and challenges – for the local industry.**

The mining industry has traditionally been conservative when it comes to investments in new technology. From the new mechanised digging tools that were introduced during the industrial revolution to modern automated innovations, miners have allowed early adopters to deal with any bugbears, implementing new technologies only once they were able to provide a definitive value.

This is slowly starting to change as rapid expansion in operating and planned mines, alongside declines in demand over the past decade, have pushed miners towards a renewed focus on more efficient and lean operations. At the same time, mining companies have faced demands for better environmental performance and transparency, driving the sector towards a new role in the world's transition to a more sustainable economy.

Technology is helping miners modernise to meet these needs, gaining the reliability, predictability, and efficiencies they need to remain profitable and relevant. The Equinix Mining Technology Report 2021-22 revealed that mining companies are investing heavily in connectivity, telecommunications, automation, and data technology. A survey carried out as part of the report found that 93% are increasing overall spending on technology, and 44% reported they are significantly increasing investment.

## Staying ahead of operational requirements

Several recent technologies have made a positive impact on mining operations, including predictive asset maintenance,

autonomous trucks, IoT sensors, Machine Learning (ML), robotics and automation, as well as AI and analytics. Most of these have yet to reach their maturity, but all are already allowing miners to reap real rewards.

Autonomous vehicles, for example, have slowly started replacing human-operated vehicles. The first of these was introduced in 2008, when Rio Tinto Alcan began testing the world's first commercial autonomous mining haulage system in the Pilbara iron mine in Western Australia. Since then, miners across the globe using autonomous vehicles have seen a rise in productivity of approximately 20%, a reduction in human error, as well as uninterrupted operations as these vehicles can work 24 hours a day, seven days a week.

Similarly, other technologies are allowing mines to realise a significant increase in productivity and a decrease in expenditure. Using equipment such as drones that can be manoeuvred into unsafe areas and difficult locations, mining companies can send fewer miners underground while extracting a higher output, with low risk to their employees.

The same applies to IoT sensors allowing miners to perform predictive maintenance, ensuring there is little to no downtime and reduced repair costs. AI and analytics, too, are allowing mining companies to stay ahead of their demanding operational requirements, allowing them to plan better while getting more out of their ventures.

## Connectivity at the heart of operations

The one thing all new and emerging technologies have in common is connectivity. Without connectivity, none of these technologies would be able to function, much less achieve their goals. As a result of their remote locations, most miners struggle with the kind of high-speed access that organisations rely on for connectivity to the services required by modern businesses, including the cloud, analytics, and IoT.

5G has fast become the answer to the connectivity requirements of mining houses across the world. Using highly reliable and secure private 5G networks that can perform mission-critical tasks, miners are enabling automation and improving safety while enhancing efficiency and productivity. According to analysts, 5G private networks have the potential to provide opportunities to the mining industry such as automation and remote operations due to improved coverage, lower latency, and higher reliability at every stage of business operations, creating safer, more efficient, and more productive mines.

MTN 5G Private Network's high-speed data transfers and reduced network congestion are ideal to help mines resolve their



Miners can use equipment, such as drones, in unsafe areas and difficult locations.



MTN Business, Huawei, Minetec, and Miniandante Mining Company recently signed an MoU for 5G technology equipment and connectivity.

connectivity issues and transform their operations while implementing effective use cases such as real-time operational data analysis, automation, and Occupational Health and Safety (OHS). In short, 5G networks are key to modern mines of the future.

These mines will be built using a combination of technologies to create reliable communication between personnel operating the mines, machine-to-machine communication, and information gathering, to enable greater levels of efficiency and safety. In fact, Accenture and the World Economic Forum (WEF) have found that digital initiatives can help South Africa's mining industry alone create R213 billion (\$14 billion) in value by 2026.

In the past, Wi-Fi networks were suitable to a certain extent, but they have their limitations. Now, with the availability of private networks and networks-as-a-service, it is important for the mining industry to collaborate to explore the value that can be derived from the enhanced use cases 5G networks offer. On the journey toward enabling the first 5G mine in South Africa and modernising the mining sector, March 2022 saw a memorandum of understanding signed by MTN Business, Huawei, Minetec, and Miniandante Mining Company for the provision of 5G technology equipment and connectivity.

### Transforming the mining industry

While the mining industry is trying to navigate the opportunities and threats brought about by these factors, companies in the sector have started relying on solution providers like MTN and their industry partners to fill the gaps and enable the benefits emerging technologies bring. From IoT to cloud-based analytics solutions, to secure their networks and applications, miners are turning to technology to advance digital operations.

However, few service providers can deliver a complete end-to-end solution. MTN Business, which saw an opportunity to leverage its expertise in telecommunications and technology to help transform the mining industry in South Africa and Africa, has developed a suite of solutions and guiding principles designed for its 5G Private Networking to address the challenges faced by the industry and to unlock new opportunities for growth and innovation.

Forming partnerships with leading companies in the mining industry, such as Canyon Coal, as well as technology partners such as Ericsson and Huawei, MTN Business has developed and implemented customised 5G Private Networking solutions that address the needs of the mining industry. Starting with their specific needs and requirements, MTN Business works closely with mining companies, and industry bodies and regulatory agencies, to understand



Miners are turning to technology to advance digital operations.

and develop customised solutions that address their challenges.

This is not a one-size-fits-all approach, nor is it a technology company hoping to get recognition for one or two projects. MTN Business plans to scale its digital solutions by partnering with more mining companies across the African continent and expanding its network infrastructure to reach remote locations. The company also plans to invest in research and development to stay ahead of industry trends and emerging technologies.

MTN Business has developed a blueprint for the deployment and architecture of the solutions that will contribute to solving the critical challenges mines have been experiencing, regardless of their technological requirements. In collaboration with its various partners, including Huawei Technologies South Africa and Minetec Smart Mining, MTN Business is working to help the mining industry navigate the significant, important technological changes and the transformation of traditional processes. ■



VoltVision MD, Manoli Yannaghas.

# VoltVision's technology helps African

Technology to produce big data abounds, but what worth is loads of data if it cannot deliver opportunities for efficiency and improved productivity, asks technology specialist, VoltVision, which is on a mission to help African mines unlock value from big data. By *Nelendhre Moodley.*

**M**odern Mining recently spoke to co-founder and MD, Manoli Yannaghas, about the company's product offering to Africa's mines.

VoltVision is a company that digitises high and medium voltage industrial power networks, transforming raw power data into actionable information.

According to Yannaghas, VoltVision's focus is underpinned by the tagline: 'If you can't measure it, you can't manage it'; which means the company's success at mines is backed by facts and figures.

"Our vision is to help miners access and process raw HV and MV data into something relevant to their operations. Mining operators increasingly understand that improving power performance is essential if they are to meet their sustainability and profitability agendas."

Yannaghas has spent most of his career working in and around Africa, and the African mining sector is the first vertical market VoltVision is targeting, after which it is looking to expand into other parts of the world and other heavy industry sectors.

"Some problems, associated with the accessibility and reliability of power, are relatively consistent across Africa. For mines to operate successfully, the sector requires massive amounts of power and in many cases has been tied to the use of fossil fuels. The mining industry is now working to reduce its reliance on fossil fuels, while continuing to balance the underlying lack of power security and profit, and this, I believe, presents VoltVision with an ideal



Installed V-CUBE at client site.

opportunity to help the continent unlock its potential," Yannaghas explains.

Yannaghas' two-pronged strategy targets the mining majors first and then the rest of the market, which includes mid-tier and junior miners.

Given that mining giants such as Anglo American, Barrick Gold and Rio Tinto have already invested heavily in their own data science teams and cloud platforms, their interest in VoltVision's intelligent cloud platform, ViViD, is minimal.

"However," says Yannaghas, "they do need raw HV and MV high-resolution data, which they are struggling to access. This is because of the requirement for central monitoring of all their assets, and to get the raw data they need untethered data that can be accessed off-site, which is hard to get. I see VoltVision's V-CUBE, an IoT data extraction Gateway, as a key enabler to help mining majors access this data for use on their own platforms.

"Our end-to-end product combines access to raw data with our ViViD cloud platform and targets the rest of the market. The solution combines data extraction plus the visualisation, alerting and analysis that is provided by the ViViD platform. It gives companies the ability to see how the power side of their operations is being run across all parts of the business, thereby maximising efficiency and addressing the key issues of profitability and sustainability."

## VoltVision in South Africa

The UK-based specialist recently opened a global power analytics centre in Johannesburg, which it will use as its Africa hub to build its profile and client base across the continent's mining sector.

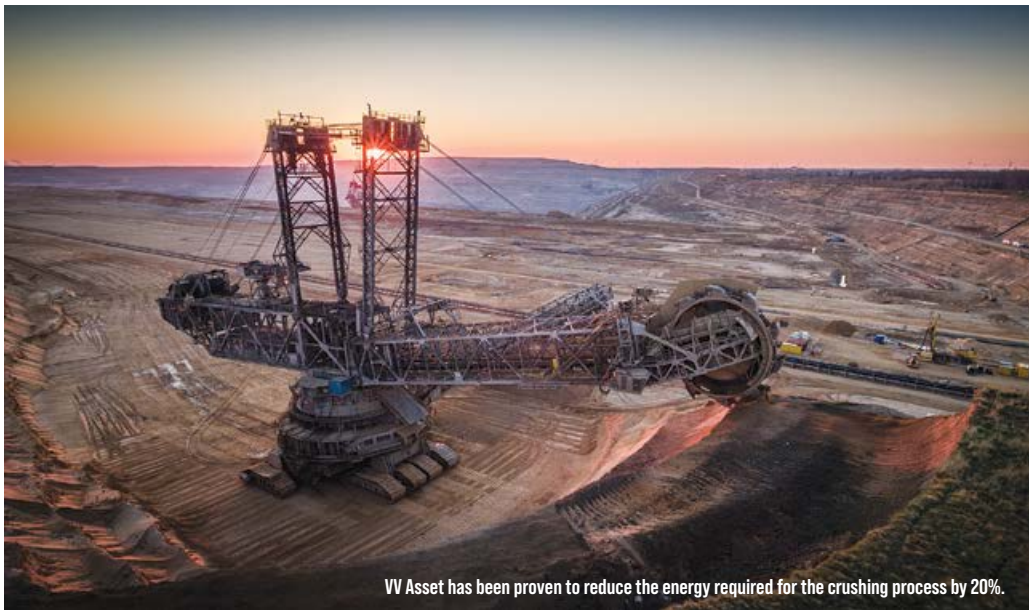
The company has already rolled out several initiatives in Africa and is in the early stages of providing its skill set to power-starved South Africa, which continues to be hit by frequent loadshedding.

ViViD platform on an iPad.



# mines unlock value from big power data

“Having recently opened our South African office we see a huge opportunity to help the domestic mining and industrial operations sectors,” Yannaghas explains. “There is not a lot we can do about the level of load shedding taking place in South Africa, but we are able to help the industrial sector maximise its efficiency and manage any power transition (to solar for example).” VoltVision is currently helping Anglo American at its Mogalakwena platinum mine, located in Mokopane, Limpopo Province, to manage the power networks on its prototype hydrogen electrolyser, which is set to generate the hydrogen needed to power its new hybrid mining trucks.



VV Asset has been proven to reduce the energy required for the crushing process by 20%.

Further to this, the technology specialist recently completed the first phase of a programme to digitise the power networks at Endeavour Mining’s six West African gold mines (Ity mine in Cote d’Ivoire; and Hounde, Mana, Karma and Boungou mines in Burkina Faso as well as Sabodala-Massawa, the largest producing gold mine in Senegal) and it is busy with Phase 2 of the project.

Phase 1 of the project was designed to help maximise the efficiency of Endeavour’s electrical power systems, enabling it to improve power quality, increase uptime and reduce CO<sub>2</sub> emissions, while lowering energy consumption and operating costs.

Endeavour has identified significant power efficiency gains with both CAPEX and OPEX cost savings as the project has been rolled out. VoltVision has progressed to Phase 2 of the roll-out, which is focusing on condition monitoring, failure prevention and further power reduction analysis.

“This is the only retrofit digitisation solution commercially available for high and medium voltage power networks in the mining industry,” says Yannaghas. It can be installed, operated and managed remotely, and requires no site visits from VoltVision representatives and no shutdowns. “This,” Yannaghas emphasises “is not only a highly innovative feature but one that is ideal for mines situated in remote and extreme environments.”

He adds that because the technology is plug-and-play, Phase 1 was installed successfully by Endeavour’s own engineers, without any site visits from VoltVision or any disruptions to production, proving its suitability for remote and hostile environments. ■



VoltVision Power helps companies reduce their static power and CO<sub>2</sub> emissions by up to 10%. VV Net Zero allows you to measure these CO<sub>2</sub> reductions accurately.

## VoltVision technology

- ❑ VoltVision’s IoT, data extraction Gateway, the V-CUBE, is a key enabler helping mining houses, large and small, to access power data for use on and off-site through their own, or VoltVision’s ViViD, cloud platform.
- ❑ VoltVision’s digitisation programme works by retrofitting its V-CUBE IoT data extraction gateways to existing electrical protection equipment (regardless of age or manufacturer).
- ❑ The V-CUBE extracts detailed system and/or asset performance data 24/7, which is then stored in the cloud, saving millions in the high cost of in situ historian databases.
- ❑ VoltVision converts HV and MV data into actionable information, which is made available on its ViViD platform through dashboards, reports and alerts for use by operations and management teams, and which is available to them anywhere in the world.

feature



# Shell helps miner's lower their carbon footprint

Petrochemicals giant, Shell recently attended the Investing in African Mining Indaba, where it showcased its latest products and services offering and its drive towards sustainability and the environment.

According to services manager, Mpho Mokwena, the event offered a great networking opportunity and allowed Shell to highlight its move to becoming an end-to-end solutions provider, helping its customers operate efficiently in line with their sustainability objectives, while maintaining or improving their overall primary business objectives of improved productivity and thereby profitability.

## Driving the green agenda

Like its peers, the petrochemicals giant is working to accelerate its transition to net zero by 2050 and, as such, continues to innovate.

According to Mokwena, by adopting the latest technology, Shell can significantly reduce its carbon



Shell lubrications expert at an operation in South Africa.

emissions and help its customers to do the same.

“In fact, our processes are designed to reduce our carbon footprint throughout the entire value chain, all the way through to product packaging.”

With Shell viewing its clients as partners, the company works to understand its customers’ needs and their sustainability objectives, which it integrates with those of its customers’ programmes.

Shell provides mining customers with tools and products to improve their efficiencies.



feature



Shell team at the Investing in Mining Indaba.

Further to this, in line with Shell's Enterprise Supplier Development strategy, one of its key pillars is supporting local communities and, as part of its enterprise development initiative, the company has programmes geared towards supporting communities in areas in which it operates, especially initiatives related to skills transfer.

"We invite small-to-medium enterprises within the local communities to take part in our skills upliftment programmes and, where possible, we try to integrate the communities into our procurement systems. Essentially by upskilling the communities where we do business, we improve the environment in which we operate."

### New products on the market

Shell, one of the biggest oil and fuel suppliers to the mining industry, recently launched two new products into the market - Shell Remote Sense, a data driven real time oil condition monitoring tool and Shell ADBLUE, a product designed to reduce emissions and the overall carbon footprint.

Shell Remote Sense was introduced to South Africa last year and has since been well received with several customers currently trialling the product.

The product improves on traditional lab-based oil analysis as the oil is continuously monitored, allowing the client to catch potential problems before they cause damage to equipment.

Shell Remote Sense helps customers avoid costly unplanned downtime by providing actionable insights on the condition of lubricants used by Shell clients. Insights are then delivered in real-time via the Shell Remote Sense website and email alerts. These can be integrated with existing monitoring and telemetry systems via Application Program Interface connections.

"The tool is currently in use at some of our key mining customers and we strongly believe the technology will revolutionise oil condition monitoring. One of our customers is trialling the product on its



mobile equipment with another customer trialling it on stationary gearboxes. They have seen improved performance in terms of extending the oil drain intervals. The biggest value add of Shell Remote Sense is the ability to extend oil drain intervals. Historically, customers have worked according to a maintenance schedule, which often calls for the disposal of oil, even if it is in relatively good condition. But with Shell Remote Sense, customers can make informed pre-emptive maintenance decisions, which also works to reduce unplanned downtime. This tool helps mining customers to improve their efficiencies and save by reducing the total cost of operations."

Although different OEMs have different requirements, overall customers have improved their oil drain intervals by about 100 to 200 hours, beyond the historical 500 hours, which has presented a great saving in terms of productivity, given that the machine is available for longer period as a workhorse.

Aside from South Africa, Shell has introduced Shell Remote Sense to resource rich Australia, Peru, and Brazil – other strong mining destinations.

Most recently, Shell Lubricants South Africa, launched SHELL ADBLUE, a water-resolvable fluid, developed to treat fumes and help vehicles conform to emission norms. The product, which is mixed with fumes to break the NOx-emission in the SCR-catalyst, is stored in a separate tank on the truck and is sprayed in metered doses into the exhaust stream of the vehicle. AdBlue reacts with the exhaust gases from the engine and helps to convert oxides of nitrogen emissions into harmless gas and water vapour.

Most heavy-duty vehicles that comply with Euro 4 or Euro 5 regulations use AdBlue.

All our products are geared towards helping our customers reduce their emissions and Shell ADBLUE is the latest addition to the product line," concludes Mokwena. ■

Shell products are geared towards helping customers reduce their emissions.



Shell-Lubricant-AdBlue.

# Africa growth continues for SA's modular pioneer

Two decades ago, Pilot Crushtec pioneered a modular approach to crushing and screening plants in South Africa, and the company continues to pursue ambitious growth plans to take the concept all over Africa, and beyond.

With over 300 modular crushing and screening plants already in operation, the company will be more active in promoting the benefits of modular options this year. This is according to Francois Marais, sales and marketing director at Pilot Crushtec, who spoke to Modern Mining.

“Rising commodity prices have already spurred sales of mobile crushers to contractors, especially in southern Africa,” says Marais. “In the past six months we have also seen the demand for aggregate growing significantly. We believe our modular range is perfectly tailored to their requirements.”

## High point

Among the high points of the last year was an order for the largest modular plant Pilot Crushtec has produced in its 33-year history. This is destined for a large-scale aggregate project within a mining operation in the Democratic Republic of Congo; the mine will be using the stone for its own haul roads and other on-site applications. The solution will include multiple crushers, screens, conveyors and surge bins. By early 2023, the first tranches of equipment had already been dispatched, and the final installation should be complete before the middle of the year.

“That is the beauty of the modular option,” Marais emphasises. “The necessary components can be shipped to site within a short time frame and – within six months of placing the order – the customer can be installing and commissioning the plant.”

## Export growth

The demand in the region is coming not just from mines, quarries and contractors, he explains, but from some large government infrastructure projects north of South Africa's borders. This is giving the construction sector in countries like Zambia a significant boost, as roads are improved to facilitate trade in the region. Beyond Africa, there has also been exciting demand from Australia for vertical shaft impactors (VSIs).



Pilot Modular conveyor systems provide efficient transfer of a wide variety of materials.

“The result is, the value of our export orders in 2022 almost exceeded that of our local business in South Africa, where Pilot Crushtec has its traditional market,” he says. “With demand from other countries growing, in the year to come we will continue to push that trend.”

With the depressed state of the South African economy, many quarries are making valuable use of modular solutions, explains Marais. It has allowed them to replace just those weak crushing stations within their operation, rather than commit to larger replacement programmes.

“If a cone crusher needs replacing at secondary crushing stage, for instance, we have seen clients opting for a skid-mounted modular installation – a simple plug-and-play solution,” he says. “On the domestic front, this has been the preference in favour of complete plants. The modular solution can be deployed quickly so the plant can continue to process material.”

This makes sense for the domestic market, he emphasises, especially given the high levels of competition in the local market relative to demand. Without the necessary revenue to expand, it is important to utilise existing infrastructure to its fullest capacity.

## Modular pioneer

To contextualise Pilot Crushtec's experience in the modular approach, he recounts the company's role as a pioneer in the early 2000s. It was then that it began incorporating jaw crushers and cone crushers into a modular primary, secondary and tertiary crushing circuit, complete with a screen module and conveyors for materials transfer.

“When we came up with preconfigured modules, the concept was so unusual that it was ridiculed in certain quarters,” he explains.

“Ten years after we began this trend, however, almost all the brands had a modular option in their offering.”

The dominant view 20 years ago was that any plant needed six to 12 months of preparation time involving design engineers and draughtsmen to develop a bespoke solution to suit the site. To this design time was added the manufacturing stage, followed by the often-lengthy installation period on site and the final commissioning. Of course, there are many mines and aggregate producers who would still require specific solutions through designing their systems from scratch, he acknowledges. At the same time, the preconfigured solution meets the needs of a wide range of applications – and can do this quickly and cost-effectively.





Above: The Pilot Modular range includes world renowned Metso Outotec jaw and cone crushers and certain screening modules.

Left: Pilot Crushtec's Pilot Modular range consists of ready-to-use semi-mobile, skid mounted crushing, screening, washing and stockpiling equipment.

### Rapid deployment

"In addition to having the existing designs, Pilot Crushtec also stocks the components, which further speeds up the process," he says. "In some projects, we have been able to deliver and set up the modular plant on the customer's site within three months of getting the order."

The cost savings inherent in the modular solution are not even the main financial consideration, he points out. In fact, the value of the time saved comes through in its rapid return on investment, as the plant can start work earlier and be generating revenue for the owners much sooner.

As the southern African distributor for Metso Outotec for the past seven years, Pilot Crushtec today uses imported Metso Outotec crushers and screens in its modular solutions. The components around these key items have evolved and been refined with time.

### Sophisticated designs

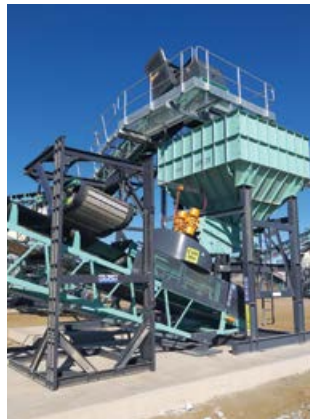
"Our designs have become more sophisticated, and we learn constantly about how to meet changing requirements in the field," he says. "Stringent mine safety standards, for instance, are embodied in our designs to a very comprehensive level – such as galvanised walkways and handrails, and the use of angle iron instead of round tubing."

Importantly, Pilot Crushtec offers customers all the backup and support they need, he notes. Many of its customers in Africa have had experience of importing crushing and screening equipment, which came without the necessary service levels and spare parts availability.

"Many have come to us afterwards, with an appreciation of both our high-quality products and the strong support levels for which Pilot Crushtec is renowned," he says. He highlights that company's expansion strategy leverages its reputation for quality, experience and responsiveness – and drives this home with numbers that do not appear on procurement quotations.

### Numbers that matter

With over 170 modular cone crushers – and more than 200 modular jaw crushers – commissioned and installed by Pilot Crushtec, there



Above: The high performance, self-cleaning belt magnet is 900 mm wide with stainless steel cladding.



Above right: The Twister VSI crushers are ideal for use as tertiary and quaternary stage crushers in quarrying, mining, recycling, infrastructure and construction applications.

Right: Pilot Modular equipment comes standard with inclined staircases, galvanised walkways constructed from angle section and fully guarded drive arrangement.



is an extensive population of equipment to be supported.

The ready availability of parts is a key aspect of its offering, so it keeps approximately 93 000 individual items in stock – including 2 500 wear parts for crushers and impactors. The parts department is manned by 20 dedicated parts personnel, and is available 24 hours a day and seven days a week.

"In total, Pilot Crushtec has more than 4 000 modular and mobile pieces of equipment commissioned and supported," says Marais. "Over the years, our equipment has processed around five billion tonnes of material – a testament to its reliability and robustness."

He concludes that the company's continuous investment in its capacity to serve its growing market is a core aspect of its offering. The innovation and quality of its modular solutions – backed up by the extensive support network – ensures that customers achieve the uptime and production they expect.

"Meeting their production commitments is what our customers rely on for their reputations and their growth," he says. "Our modular solutions help them deliver on these promises." ■

# South Africa's mining underperformance is bad for everyone



Ross Harvey, director of research and programmes at GGA.

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

Just-released data from Statistics South Africa reveals a mining production contraction of -1.9% year-on-year to January 2023. It is the twelfth consecutive month in which the year-on-year contraction has been negative. Platinum group metals (PGMs) contributed most of the decline, being 15.2% down itself year-on-year and thus contributing -3.5 percentage points to the overall figure. Diamond production was also down, accounting for about -0.9 of a percentage point to the aggregate.

At a benchmark of 100 for mining production in 2019, the only minerals and metals to have increased in production volume since then are chrome ore, manganese ore, and diamonds. Gold, iron ore, copper, PGMs, nickel, coal and others have all fallen. Despite falling production, year-on-year overall sales in the industry have increased by 6.8% to January 2023, though the trend cycle is slightly downward off a peak reached between May and July 2022.

These figures are discouraging, not least because they display early warning signs of not being able to capitalise, for the third time in recent history, on a structural global commodity boom. The demand for critical raw materials to power a green energy transition is not fictitious daydreaming on the part of environmentalists. Increasingly, global capital will flow towards firms that demonstrate their



Transforming gold into jewellery is an example of downstream beneficiation.

sustainability credentials and avoid greenwashing. This is because the drive for net zero emissions is not only about the environment: it's also about sovereign energy security in an increasingly uncertain world.

The global multilateral order that emerged after the fall of the Berlin Wall in 1989 is fracturing, as demonstrated in a recent note by the Economist Intelligence Unit. "Over the past year the number of countries actively condemning Russia [for having invaded Ukraine] has fallen from 131 to 122, as some emerging economies have shifted to a neutral position." Those signalling neutrality, now 35 countries, represent more than 30% of the world's population, of which China is obviously the largest. The changes also highlight "Russia's growing influence in Africa."

Russia's invasion of Ukraine exacerbated pre-Covid trends of global divergence. It also changed the energy map forever. While some western countries resorted back to heavy fossil fuel usage in the short run (leading certain African countries to accuse them of hypocrisy), the long-term trends towards net-zero in western countries is unlikely to be hampered. Of course, global agreement at the UN COP28 later this year is not looking promising, with emerging economies becoming more

South Africa has many raw materials to feed the energy transition.



strident about their need to continue using fossil fuels to electrify homes and businesses. Nonetheless, we have seen a move towards more individualised or autarkic energy security positions. Germany swivelled away from its dependence on Russian gas in a phenomenally short space of time, boosting US gas sales. More broadly, though, Europe and the US are doing everything they can to secure a steady supply of clean raw materials to feed the energy transition.

South Africa has many of these raw materials – PGMs, chrome, manganese, copper, nickel and so forth are all critical ingredients in technologies such as wind turbines, solar panels and electric vehicles. But we cannot keep the lights on, run our ports properly or address logistical challenges such as freight rail requirements. Corruption and deeply embedded organised crime at numerous state-owned entities, not only Eskom, are the ultimate drivers of our inability to capitalise on the new commodity boom. I have written previously of changes to mining legislation that could also speed up investment into exploration in South Africa, but these suggestions are unlikely to shift the needle against the backdrop of infrastructure, energy and corruption challenges.

South Africa's inability to capitalise on a new commodity super-cycle is not a simple matter of missing another boat. It is a major part of the reason why the country will only achieve a 0.3% growth rate in 2023. This is because mining is a bell-weather for economic health. It remains a major employer despite increasing mechanisation. If it were integrally connected to a workable industrialisation strategy (which requires abundant, inexpensive energy), it could be a source of labour-absorptive growth too. This is because of its ability to act as a flywheel for manufacturing.

Industrial strategy tends to inappropriately emphasise downstream beneficiation – adding value, for instance, to gold by transforming it into jewellery. Obsession with this form of beneficiation often blinds policymakers to seeing other opportunities and is typically unwise as countries like South Africa are not going to be competitive against the likes of India when it comes to jewellery manufacturing. Other opportunities often exist side-stream or upstream of mining itself. South Africa used to be a world-class producer of mining equipment, for instance. This makes economic sense because of the savings on transport costs. It also makes sense to encourage, from a policy perspective, because



there are new technologies entailed in manufacturing mining equipment that could create positive spillovers. In other words, new technologies could spawn other industries.

The classic example is Finland, which did not blindly pursue furniture manufacturing simply because it had an abundance of forests (which it does). Rather, Finland invested in ensuring it could cut those trees efficiently. The technology spillovers led to the creation of Nokia. South Africa must start thinking like this, not least because the latest employment figures show how desperate we are for labour-absorptive growth.

In the fourth quarter of 2022, our official 'expanded' (counting those who would like to work but have given up looking for work) unemployment figure stood at 42.6%, slightly improved from the quarter before. Nonetheless, nearly half of the labour force cannot find work. Given the strong relationship between dignity and meaningful work, and the desperation that ensues from its absence, it is no surprise that large parts of South Africa are susceptible to organised looting.

With the current governing cabinet, one has to doubt whether South Africa can recover economically and kickstart mining growth again. Pundits looked forward to a cabinet reshuffle in March, naively hoping that the president would find a backbone now that he does not have to consider how to win a second term anymore. At this stage, it looks more like a lame duck presidency than a decisive one. A pervasive attitude appears to have become entrenched that one should be 'practical' and 'allow some people to eat' – a euphemism for allowing a bit of contract skimming at Eskom. Until that attitude changes or is removed, the hard work of addressing infrastructure backlogs, energy and corruption can hardly start. ■

The country used to be a world-class producer of mining equipment.

---

*South Africa's inability to capitalise on a new commodity super-cycle is not a simple matter of missing another boat. It is a major part of the reason why the country will only achieve a 0.3% growth rate in 2023. This is because mining is a bell-weather for economic health.*

## Hitachi Construction Machinery begins parts remanufacturing in SA

Hitachi Construction Machinery Southern Africa president, Tomoatsu Toki, has



Hitachi Construction Machinery begins parts remanufacturing in SA.

announced that, in March 2023 at Hitachi Construction Machinery Southern Africa, the construction machinery manufacturer embarked on the production of remanufactured parts for construction machinery, such as medium to large sized hydraulic excavators and medium sized wheel loaders.

In addition to parts remanufacturing for mining machinery, conducted in Zambia from 2012, the target will be expanded to construction machinery to strengthen its parts remanufacturing business in Southern Africa.

“We will also contribute to reducing environmental impact and realising circulating society through further reduction in CO<sub>2</sub> emissions and industrial waste. Our customers in South Africa can purchase remanufactured parts with warranty and thus reduce component procurement costs. The supply of remanufactured parts within South Africa shortens lead time to delivery and keeps down transportation costs. In the future, the remanufactured parts will be supplied to neighbouring countries as well.” ■

## OTRACO gains Level 1 B-BBEE accreditation



André Bode, OTRACO's MD.

OTRACO Southern Africa, a leader in off-the-road (OTR) tyre management solutions and a subsidiary of Bridgestone Southern Africa, has been accredited as a B-BBEE Level 1 supplier. André Bode, OTRACO's managing director, says the accreditation is an important milestone in further enhancing the company's ability to deliver specialist tyre management solutions to the mining and construction industries.

“We have always regarded transformation, and thus B-BBEE, as a business imperative because it will drive South Africa's future economic growth — a view that is fully aligned with Bridgestone's,” he says. “Our clients in the mining and other heavy industries are also on a transformation journey, and their suppliers need to be in lockstep with them.” ■

## Condra manufactures unique suspension crane

Crane manufacturer, Condra, is set to manufacture a 15-ton suspension crane of unusual configuration as one of two overhead cranes ordered for underground use at a Botswana diamond mine. The second machine is of conventional overhead design, the company said.

According to Condra, the arrangement of the suspension crane is rarely seen: two I-beams defining its area of movement will be bolted to rock-bolt flanges anchored in the roof of a mine chamber after blasting, excavation and preparation as a service workshop. The Ibeams will hang from the chamber's ceiling, whereas they are more usually the topmost side components of a fixed gantry constructed from the ground up.

Condra designed this crane to specifications supplied by the project's consulting engineers. By suspending the crane, it will deliver the greatest possible lifting height, reducing the volume of rock needing to be blasted and excavated to form the cham-



Typical overhead crane under test in Condra's factory.

ber. After installation, the 11-metre span, 15 ton crane will have a lifting height of 9 m.

The cranes are scheduled for delivery in 2024. ■

## Multotec celebrates 10 years of operating in Mozambique

Multotec Services Mozambique Lda, recently celebrated 10 years of operating in the Southern African country, where it established a branch to service clients in the coal fields in the Tete Province. In addition, the company also services clients involved in graphite, mineral sands and precious stone mining in other parts of the country. ■

## Index to advertisers

Barloworld	IFC
Enaex	OFC
FL Smidth	22
Invincible Valves	OBC
Kaltire	3
Komatsu	7
KSB	27
Maptek	5
Schurco	28
Vega	IBC
Weir Minerals	23



WE DON'T DO A HUNDRED THINGS.  
WE DO ONE THING RIGHT!  
**THE 6X<sup>®</sup>. OUT NOW!**

We have known this for over 60 years. That's why this new radar level sensor is not available in 100 different versions, just one perfect one. The VEGAPULS 6X is highly versatile, absolutely reliable and works in any process and environment. The only thing it doesn't do is stress.

**VEGA. HOME OF VALUES.**

[www.vega.com/radar](http://www.vega.com/radar)

**VEGA**



# TRUST IS WHAT MAKES OUR NAME OUR PROMISE.

Major industries in South Africa and globally trust Invalve Valves to continually innovate and invest in valve solutions for their industries.

With in-house rubber lining services for valves, pipes, fittings and vessels, we are able to offer complete service, maintenance and reconditioning services with exceptional service, pricing and quality standards.

The bond we have with our customers, coupled with world-class facilities means that the Invalve Valves team is able to continually provide customers with our enhanced services that leads to their profitability.

**+27 11 822 1777**  
**enquiries@invalve.co.za**  
**invalve.co.za**

**LEVEL 1  
BBBEE**

GENERAL INDUSTRY | MINING | PETRO-CHEMICAL | POWER GENERATION | WATER | SEWERAGE

**If its not INVAL, it's not Invalve**

