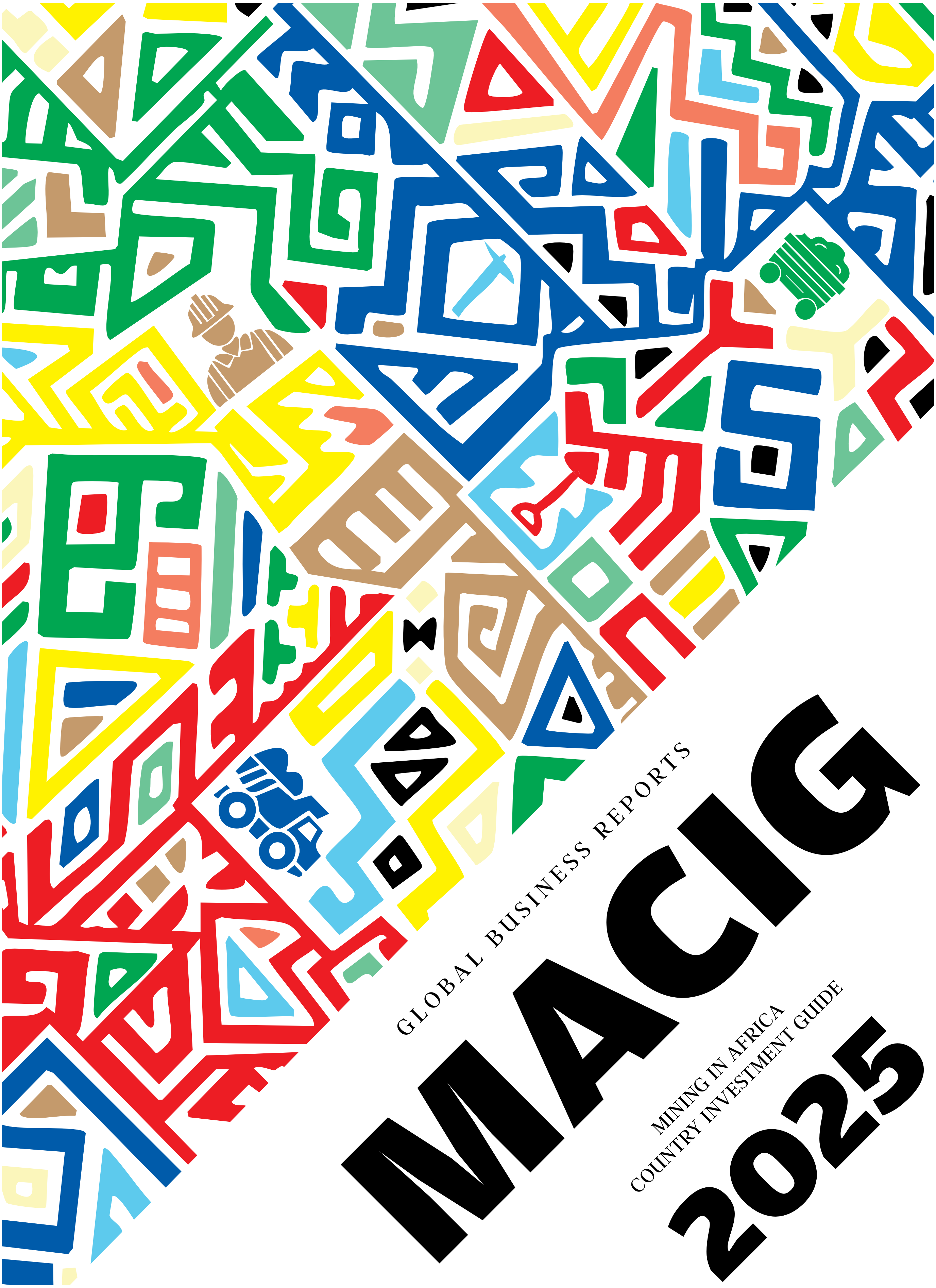


GLOBAL BUSINESS REPORTS

MACIG

MINING IN AFRICA
COUNTRY INVESTMENT GUIDE

2025

Dear Readers,

Welcome to the 11th edition of *Mining in Africa Country Investment Guide (MACIG)*, a book we are proud to see established as the incontestable first source of African mining intelligence, and an indispensable companion to a better understanding of the continent.

For this edition, we have focused on making this large report as practical and easy to navigate as possible. The first part of the book deals with a primordial question: How investable is Africa in 2025? Drawing from interviews with mining operators and financial institutions, we conclude that Africa is probably riskier today than it was a decade ago, when GBR compiled its first MACIG report. However, the rewards – and the stakes – are also higher, and Africa's prime geology and its relevance to current geopolitical trends have helped offset higher jurisdictional risks.

The second section charts Africa's positioning in eight key commodities: gold, copper, uranium, coal, manganese, nickel, graphite and lithium. While gold and copper are the clear winners in terms of price gains, we also find the uranium market brimming with anticipation, while the battery cluster grapples with the inescapable Chinese price effect; we assess whether this group can break out of the cycle through a potential green/source premium and the African continent's role in the green energy transition.

In the third section, we are cartographing 12 of Africa's mining jurisdictions, by region: Southern Africa (South Africa, Namibia), West Africa (Ghana, Burkina Faso, Mali, Côte d'Ivoire), Central Africa (Zambia, the DRC), and East Africa (Tanzania, Rwanda, Uganda, Ethiopia). Juggling the tricky politics of omission and inclusion, we make a point of going beyond reporting on the usual suspects – the well-known mining countries – and we test new grounds, particularly in the East African section.

Lastly, we wrap up our extended 'map' of the industry with an analysis of the supply chain. Articles on logistics, power, equipment and technology are woven into a larger discussion about value addition on the continent. We study the perennial question of how to turn Africa's value deficit into a value surplus through meaningful investments and what constitutes such investments.

MACIG would not be possible without our interviewees. 150 leading executives, a large-scale sample of the market, have contributed to the 2025 edition of MACIG, and we take this opportunity to thank them for allowing us some of their valuable time, while also hoping that the time they spend reading the pages that follow will prove equally valuable for them.

Alfonso Tejerina
Director and General Manager
GLOBAL BUSINESS REPORTS

Use QR codes in this book to access extended content online.

CONTENTS

INTRODUCTION

COMMODITIES

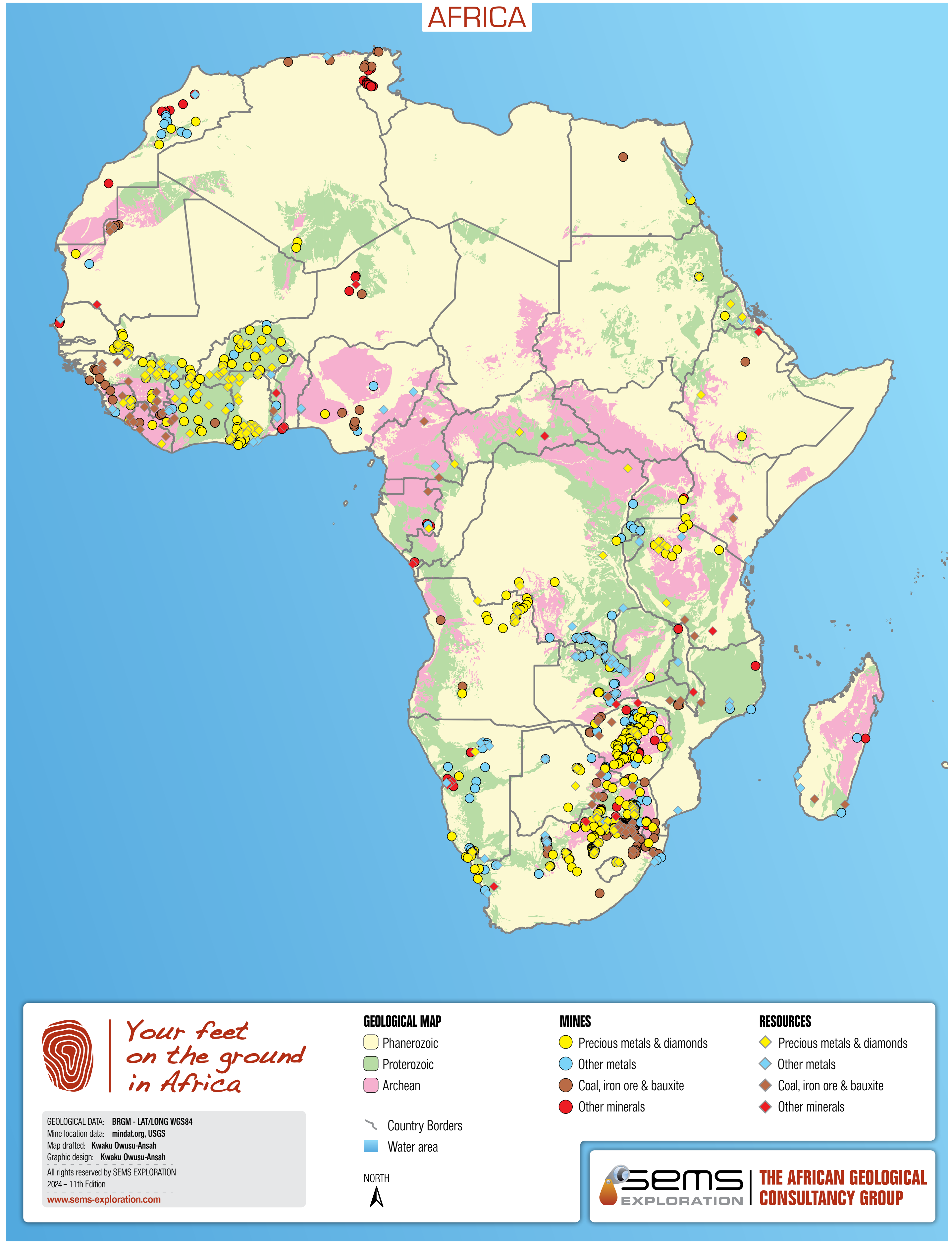
COUNTRIES

SUPPLY CHAIN

All interviews for the book were conducted between July and December, 2024.

Research conducted by Lorena Postelnicu-Stancu and Salma Khaila. Edits by Mungo Smith. Graphic Design by Kaori Asato

A Global Business Reports Publication
For updated industry news from our on-the-ground teams around the world, please visit our website, where you can subscribe to our newsletters, and follow us on Linkedin and Twitter: @GBReports



INTRODUCTION

"The geopolitical dynamic of risk for the past decade has been that of a scramble for security of supply. China has been highly tolerant of risk, and that is forcing America and Europe to also take higher risks. This has resulted in many transactions at high premiums."

Vusi Mpofu, Sector Lead: Mining and Chemicals,
NEDBANK

Image by Sean Robertson at Unsplash

Welcome to Africa

Investability in the continent

Any foreigner who has visited Cairo has probably been greeted by a local passersby with a friendly, recurrent salute: "Welcome to Egypt." The Egyptian government can be said to bid a similar welcome to foreign investors in mining, in a more figurative way. It has joined other countries in Africa that want to either grow or start their mining sectors. How welcoming – and how investable – Africa has become today for the foreign mining investor is the subject of the following paragraphs.

The main point of attraction to the continent is obvious: Africa is the most resource-abundant continent - yet investment decisions are rarely driven by geology alone, or else, Africa would be the main beneficiary of exploration dollars. However, according to S&P's most recent 'World Exploration Trends' (2024), Africa's combined exploration budget of US$1.27 billion lags behind places like Latin America (US$3.38 billion), Canada (US$2.44 billion), Australia (US$2.2 billion), and the US (US$1.62 billion).

A decade ago, Africa took a bigger share of global exploration budgets, accounting for 14%, yet, today this has shrunk to 10%, an indication that Africa is losing out. For a company like BHP, the biggest mining group by market cap, the resources world is its oyster. However, the world narrows down to a couple of hotspots once BHP's exploration team applies a series of conventional criteria to identify the places where they can search for their next Escondida or Olympic Dam-like top-tier deposits. Africa is finally back on BHP's list, 10 years after the major exited the continent. Africa's geology and opportunity of scale were surely known to BHP all along, but the above-the-ground conditions in Southern Africa needed to change. Recent improvements have convinced BHP to return to the continent through two investments in Botswana as part of its BHP Xplor accelerator program, as well as taking a stake in Kabanga Nickel, a subsidiary of Lifezone Metals, in Tanzania.

A lot has changed over the past decade since GBR completed its first edition of MACIG (2014), but if we are to paint Africa in large brushstrokes for a generalized overview, the continent is probably riskier today than it was a decade ago. Nivaash Singh, head of International Mining Finance at Nedbank, a South African bank, agrees: "I think Africa has become riskier if we look back at the Arab Spring and the regime changes it catalyzed in North Africa, and also the devastating effects of Ebola on West Africa, and the series of coups before and after the pandemic."

Let's identify some of the major risks investors must take note of.

A rendition of current risks

Nationalistic policies are on the rise: In a survey by AON, the top risks identified by companies in the natural resources industry were business interruption (over 51% of respondents) and regulatory/legislative changes (over 42% of respondents). More countries in the continent, including Namibia, Zimbabwe, Ghana, Nigeria and Botswana, reverted to restricting the exports of unprocessed minerals in recent years, whereas many West African countries, including Mali, Burkina Faso, Niger, Chad, Sudan and Gabon, have seen military interventions; the new regimes manifest tendencies to increase state ownership of mineral resources. In extreme cases, governments have removed licenses or even imprisoned mining executives over tax irregularities, as we have most recently seen in Mali. A 'crackdown' on mining has been observed primarily in the Sahel, while other countries have taken softer approaches, though with the same intent of maximizing returns from the industry.

The nationalistic trend is only partly a reaction to an upswing in commodity prices. "Windfall profits tend to trigger windfall profit taxes," said Kathryn Khamsi, partner for international arbitration firm Three Crowns, warning: "There is a domino risk of windfall in profit tax arbitrations."

Disputes are likely to emerge over breaches of existing agreements. According to risk consultancy Verisk Maplecroft, government interventionism in the natural resources sector has been rising post-pandemic, probably also as a result of higher levels of national indebtedness.

The other cause of the renewed wave of nationalistic policies is rooted in Africa's troubled colonial history. Local populations and their leaders are sensitive to the idea of foreign exploitation of resources. The Sahel is again an example of that, countries like Mali distancing themselves from former colonial Western powers and leaning more towards Russia or China. But this is also prevalent in South Africa, whose history of apartheid remains a recent memory. "Mining is an emotional issue for many people, stirring feelings of national pride and ownership over natural resources. Communities often oppose foreign ownership of assets," explained Sipho Nkosi, chairman of South African-based venture capital firm Talent10 Holdings.

Indices of governance, rule of law, economic freedom and transparency remain broadly flat in Sub-Saharan Africa and lower than the global average: The average mark for economic freedom in 2023 across 51 African countries was at 51 index points, significantly lower than the global average at 59 index points. This measures the Rule of Law; Limited Government; Regulatory Efficiency and Open Markets. Africa has the highest concentration of corruption levels according to the Corruption Perception Index.

Political instability and wars: Africa is currently the continent with the most wars (conflicts with more than 1,000 deaths/y). The number of annual violent events caused by militant Islamist groups has increased three-fold in the last decade, according to the Africa Center for Strategic Studies. The most impacted region is the Sahel. If 10 years ago, this was the region facing the fewest deaths linked to violent extremism, it is now the region with the most. For Simon Meadows Smith, managing director for SEMS Exploration, a Ghanaian company servicing the broader West African region, the security deterioration in the Sahel is the most obvious change in the past decade: "This is most noticeable in Burkina Faso, which was the busiest mineral exploration country in the region, 10-12 years ago. Sadly, Burkina is a long way from that now," he said.

> *"The traditional model of digging the material up and shipping it to China for refining is getting challenged with multiple African governments demanding local processing. These dynamics could potentially turn projects worth a couple of hundred million dollars into multibillion-dollar projects."*
>
> Greg Hayes, Senior VP Project Development, Minerals & Metals, **Wood**

In a ranking of the world's most dangerous countries by the Security Journal, Burkina Faso, the DRC, Mali, Ethiopia, Nigeria and Sudan make the unfortunate cut.

Availability of infrastructure, local supply and energy: In landlocked countries and remote mining sites, or in jurisdictions with a nascent mining sector, the local supply chain is undeveloped, making mining operations fully dependant on imports for everything from equipment to reagents and other consumables, as well as lacking connections to the power grid.

The poor state of roads leads to lower utilization rates and a shorter equipment lifespan, as explained by Ghassan Husseini, managing director of Crown Transport Logistics: "If an average truck does an average of 15,000 km/month in Europe, that same truck will complete about half that distance in Africa. Covering a distance of over 10,000 km would mean crossing over from Ghana to Chad – and that would take much more than a month due to road conditions, as well as border policies and regulations."

Inadequate infrastructure can both delay projects, increase costs, or render projects inoperable, and the question of who should pay the infrastructure tab is often a source of acrimony.

Greater ESG scrutiny and the rise of reporting standards: Mining has seen bigger pressures on ESG aspects, but these have so far been disparate and hard to trace. However, regulations are formalizing into global standards that everybody must implement to the same degree. The best-known example is the formalization of the Global Industry Standard on Tailings Management, which sets a precedent for the industry. Risks to unwanted exposure to illicit value chains grow bigger in countries where there is an ongoing war, such as the eastern DRC, where the trade in gold, tin and tantalum has been linked to fuelling the conflict.

Offsetting risks: geology and geopolitics

Less than 1% of exploration projects end up becoming a mine, a depressing statistic. If exploration is an inherently risky business, why add to the risks by doing it in Africa?

There are over 600 mining projects in Africa's pipeline, according to SRK Consulting. Based on TNM Marco Polo's global database, a total of 385 exploration projects (from prospects to advanced) are in just seven African countries: Tanzania (65), Namibia (61), Burkina Faso (61), Mali (57), South Africa (53), Côte d'Ivoire (45), and Botswana (43). These numbers are a far cry behind places like Canada (4,169) or Australia (2,458). However, counting the world's resource endowment tells a different story, and that is that Africa holds 30% of the earth's valuable minerals. That makes the continent a top contender for securing the world's growing mineral supply.

It is said that mining is a patient industry. Current demand projections are not. Demand for minerals deemed 'critical' is set to increase almost fourfold by 2030, according to the UN. Demand for nickel, cobalt and lithium is predicted to double, triple and rise ten-fold, respectively, between 2022 and 2050. Researchers at the University of Michigan and Cornell University have found that the world will need to mine more copper between 2018 and 2050 than it has mined throughout history.

2050 is also the deadline to curb emissions before reaching a point of 'no return.' Like mining, climate change is also cyclical; the globe has gone through various climate changes before humans could either contribute or intervene in these phenomena, unlike today. The IEA estimates we need US$800 billion of investment in mining for critical minerals by 2040 to limit global warming to 1.5°C. The pace of mineral demand and the consequences of not meeting it force the industry to act fast and take more risks. Mining cannot afford to be a patient industry anymore. The scramble for supply drives miners back to geological credentials, and therefore to places like the African Central Copperbelt.

"The need for low-carbon products is changing existing operations. Industries are moving toward producing low-carbon steel, 'green' platinum for catalytic converters and hydrogen fuel cells, and clean fuels and sustainable aviation fuels (SAF) to meet the needs of global markets."

Vivek Natarajan,
Vice President, Sub-Saharan Africa, **Worley**

There is no doubt mining is economically crucial for many places in the continent, accounting for as much as a third of GDP in countries like Zambia and the DRC. Single projects can have significant impact, like Ivanhoe Mines' Kamoa-Kakula complex in the DRC, alone contributing to 6% of the country's GDP in 2023. But today, Africa has become crucial for the global mining industry: According to the IMF, Sub-Saharan Africa could produce US$2 trillion of metals required for the energy transition by 2050. African countries are therefore better placed to dictate their own terms.

"The entire continent boasts enormous mineral wealth at very high grades that will compensate for its riskiness. Take copper: If you are looking for a high-grade copper deposit, you have to be in Zambia or the DRC, but you have a risk premium that offsets the grade. Vice-versa, South America is less risky but grades have been declining. Investors must ask themselves: Do they want a dividend yield at a discount and, if so, will that put them in a net better position than being in a less risky jurisdiction with lower grades? Only they can answer this," said Nivaash Singh, head of international mining finance at Nedbank, a South African bank.

Africa boasts some of the world's biggest mines across the mineral spectrum. These include Barrick's well-known Kibali gold mine and Ivanhoe's Kamoa-Kakula copper project in the DRC, De Beers' Orapa diamonds mine in Botswana, Kumba Iron Ore's Sishen mine in South Africa, Kenmare Resources' Moma Titanium Minerals Mine in Mozambique, and the upcoming Simandou iron ore project in Guinea. Crucially important for the world's demand for lithium, graphite, manganese, uranium and REE are other projects that have received less global attention. For instance, Trinity Metals operates some of the largest tin and tungsten mines in Rwanda, while Deep Yellow's Tumas uranium projects are among the few predicted to come into production before 2030. Peak Rare Earth's Ngualla REE project in Tanzania is also one of the most advanced in the rare earths space.

Who will finance these projects is the big question. Peak Rare Earths has a term-sheet agreement with China's Shenghe Resources that will cover the development costs of the project. As mineral supply becomes a weapon in the contest for power between East and West, we anticipate a greater risk appetite from Western countries as they try to get there first. As the holder of many of the coveted resources, Africa turns into the theater in this battle: "China has been highly tolerant of risk, and that is forcing America and Europe to also take higher risks to secure supply and counterbalance China, which already controls a disproportionate amount of supply. This has resulted in many transactions at high premiums," said Vusi Mpofu, sector lead for mining and chemicals at Nedbank.

On the African mining scene, Canadians, Australians and Brits are the leading actors, with 29% of annual exploration budgets spent by Canadian-owned companies, 26% by Australians and 18% by UK-based companies, based on data from the Deloitte Technical Mining Advisory. Chinese and African exploration companies contributed a much smaller 3% and 7%, respectively. However, China plays a bigger role in infrastructure developments in the continent, having partnerships with 44 of Africa's 54 states, according to the Atlantic Council. Following a lull in investment after the pandemic, China has revitalized its efforts in Africa, investment growing 114% in 2023 versus the previous year, noted Griffith University. A big chunk of that capital is going into the critical mineral sector, which China controls in proportion of 60% of production and 85% of processing capacity. Last year, US$7.8 billion out of the US$11 billion invested in the continent went to mining projects.

China's continued inroads into Africa is a defiance to the US and other countries' efforts to counterbalance the Eastern monopoly of supply. A higher appetite for risk, traditionally expressed by China and now gradually matched by the West, could bode very well for Africa's interests. ■

Sarvesh Suri

Africa Industry Director Infrastructure & Natural Resources
INTERNATIONAL FINANCE CORPORATION (IFC)

> *In Fiscal Year 2024 alone, we mobilized nearly US$14.5 billion for the continent, yet Africa's infrastructure gap is huge.*

What is the IFC's role in financing Africa's infrastructure gap and structuring critical public-private partnerships?
IFC is one of the largest development financial institutions (DFIs) in Africa and a leading investment vehicle focused on the private sector. IFC supports Africa to build a sustainable economy by investing in digital infrastructure, power infrastructure and transport, and by leveraging private expertise, management and finance. In Fiscal Year 2024 alone, we mobilized nearly US$14.5 billion for the continent, yet Africa's infrastructure gap is huge. Consider the power sector; nearly 600 million people (or 40%) in Africa lack electricity. We see similar gaps in other areas, such as transport and digital services. Since the onset of the COVID-19 crisis, the need for private equity has grown as national debts ballooned, leaving indebted governments unable to invest in infrastructure. The effects of climate change are putting enormous pressure on the continent. Our team at IFC facilitates private-sector investments and catalyzes opportunities to enable the continent to meet its agenda for sustainable infrastructure development.

What is driving IFC's record allocation of US$14.5 billion in Africa? Could you give us some examples of the kind of projects IFC plays a role in?
The US$14.5 billion is a combination of IFC funding and contributions from external partners and the private sector. Despite the record number, this covers only a small portion of the continent's investment needs. We do, however, see an upward trajectory of allocations in the future. Of the total allocation, about US$2.7 billion has gone into the infrastructure sector. For instance, in the off-the-grid energy space, we provided around US$100 million to Release by Scatec to develop a modular containerized solar solution holding between 1 to 10 MW in a 40 feet container. These containers can be transported by truck into remote areas. Transports were completed to Chad, Liberia and Sierra Leone, with each project delivered within nine months from start to finish—a significantly shorter timeframe compared to traditional solar generation projects that take three to five years.

Could you share more details on the mechanisms and progress of IFC's Mission 300?
Mission 300 is a joint initiative of the World Bank Group and the African Development Bank (AfDB) that aims to bring clean, affordable, and reliable electricity to at least 300 million more people in Sub-Saharan Africa by 2030.

We are currently working with 14 Sub-Saharan African countries to develop Country Compacts with business plans for governments to open the energy sector to private investors, including ensuring appropriate regulatory reforms.

We recently approved a US$200 million facility for distributed renewable energy in Nigeria, a program supported by the World Bank, AfDB, and IFC. With a US$750 million lending platform to the government, Nigeria can now provide grants to set up mini-grid projects across the country. IFC supports private companies with working capital that they can repay by tapping into World Bank grants through the government. Our ambition as part of this program is to connect 17.5 million Nigerians with electricity access.

What are the key trends in terms of private investment in Africa?
Since 2020, fragility and risk have increased in some parts of Africa, while other countries have benefited from upgraded risk ratings in global markets. Following the pandemic and Russia's invasion in Ukraine there has been a trend towards higher levels of national debt which intensifies the need for private investment. The role of institutions like IFC has become increasingly important to creating regulations that encourage FDI. MIGA, our sister institution in the World Bank Group acts as a platform providing guarantees and risk mitigation solutions to private sector investors. They also saw a record year with US$8 billion in global guarantees.

Do you have a final message?
At the interesting juncture with only five years left until 2030, IFC is uniquely placed to accelerate the progress towards achieving universal access to critical infrastructure services in Africa. With the entire world taking note of Africa, IFC's continued focus on the region, with an impressive track record of successful projects, highlights the incremental financial and socio-economic return these projects offer. We invite others to join us. As one of the largest investors in Africa, with presence in 40 countries on the continent, and investments in 44 countries in recent financial years, IFC is the ideal partner for those looking to expand and invest in Africa. ■

The Lawyer's Advice

Three Crowns, specialist international arbitration firm

"Disputes tend to arise when things change: Markets change, prices evolve, and regulators then tend to respond. Windfall profits tend to trigger windfall profit taxes, which in turn leads to a windfall in profit tax arbitrations (...) A more recent twist is non-mining companies, such as car manufacturers, entering the mining sector. This is a potential source for disputes because the mining and car industries operate in different ways and have misaligned commercial interests: the car company strives to secure the lowest price of a material, whereas the mining company wants to sell its product at the highest price."

Kathryn Khamsi, Partner

ENS, Africa's largest law firm

"South Africa has a robust legal framework when it comes to mining regulation, but there are shortcomings at the implementation and enforcement level, especially in terms of the long permitting times, which is curbing exploration. South Africa must look inward to identify how it can shorten the permitting process, primarily by addressing collaboration between government departments and current capacity constraints leading to backlogs. Investors naturally prefer the fastest and easiest application processes."

Ntsiki Adonisi, Executive, Head of Department, Natural Resources and Environment

Malan Scholes Attorneys, mining legal specialist in South Africa

"South Africa needs several things to increase its attractiveness. The most obvious is dealing with the high crime rate. If people are scared to visit South Africa, they will be even more scared to put their money here. Another aspect is corruption and the perception of corruption. The MPRD Act is a great piece of legislation to give effect to transformation, but its effectiveness is diluted by the fact that regulators make political decisions rather than administrative decisions. The next issue is deeply sensitive and unpopular, but we must drop the 30% BEE ownership requirements."

Hulme Scholes, Director

Mulenga Mundashi Legal Practitioners, local Zambian law firm

"The Zambian government has set a target to increase copper output to 3 million t/y by 2031, and this has triggered changes in policy and legal framework to make the business environment as investment friendly as possible. For example, the duty applied for importing concentrates into Zambia has been scrapped, mineral royalties are also now considered a deductible expense when calculating income tax, and we saw an amendment where timelines to get environmental approval from the Zambian Environmental Management Agency were reduced. A formal replacement of the 2015 Mines and Minerals Development Act is also in the pipeline."

Mike Chilufya, Partner

Investment

Pricing for risks

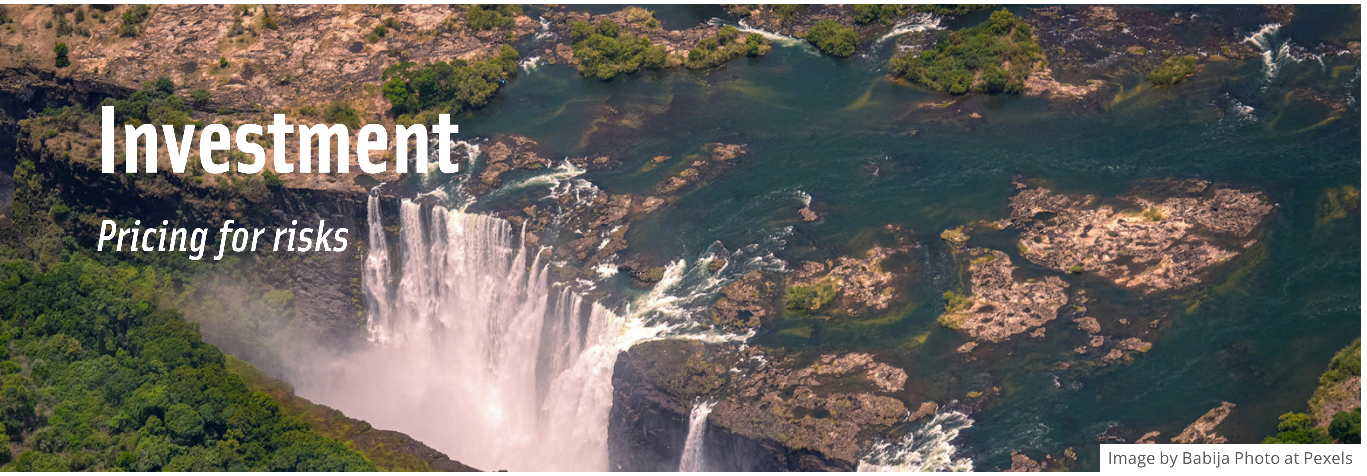


Image by Babija Photo at Pexels

10 years ago, a small junior with a market cap of around CAD10 million was looking for the same amount (CAD10 million) to finance a silver asset. This kind of proposition is rarely appealing to a debt provider, nor suitable for equity placements, yet the junior managed to secure a US$6 million loan with royalty on the production and raised the rest in equity. This junior is Aya Gold & Silver, now a CAD2 billion market cap company.

The initial loan was provided by the European Bank of Reconstruction and Development (EBRD). We spoke to Anass Joundy, associate director and lead banker for natural resources, South & East Mediterranean Region, at the EBRD about what went into the decision: "The hybrid structure of financing and streaming is something that not many financial institutions would bother with for a ticket lower than US$10 million. Still, we went ahead and the project was a success. Aya started producing and repaying the loan, their share price on the TSXV started to go up, the warrants gained value, and we began exercising those warrants, becoming a shareholder. Four years later, we reached record IRR and exited."

The past few years have been difficult for financing greenfield exploration. Globally, the aggregate market cap of mining companies has decreased in recent years due to volatility in commodity prices in 2023, which impacted financial and capital markets. According to S&P Global, the global junior and intermediate sectors raised a total of US$11.62 billion in 2023 – almost half compared to the US$21.65 billion raised in 2021, which is reflected in lower drilling activity and exploration budgets. Mining companies are also less willing to spend on greenfield exploration, preferring instead to spend on acquisitions of existing assets. According to S&P Global (2024), greenfield exploration has been declining sharply over the past decade, while M&A activity has picked up in compensation. Despite a rise in metal prices this year, S&P expects exploration budgets to decrease by 5% in 2024.

In the international financial markets, Africa is also disfavored. A higher risk perception premium translates to higher borrowing costs, both in the form of a higher coupon at issuance as well as higher refinancing costs in the secondary market. The IMF has looked into these claims and found that structural challenges, such as the development of the financial sector, the size of the informal sector, or the quality of the regulatory system, are key factors impacting the premium paid, emphasizing thus the importance of structural reforms.

> *"Streaming and royalty is ultimately a question about the cost of capital, and when you are comparing the cost of capital in a higher interest rate environment, this model is certainly appealing. For projects in Africa, it can be an ideal way of financing projects."*
>
> David Awram, Co-Founder and Senior Executive VP, **Sandstorm Gold Royalties**

Meanwhile, on the equity markets, listed firms with operations in Africa are familiar with the 'discount' their share price suffers due to the perceived risks, which makes their projects difficult to valuate. This is highest for early-stage exploration companies, said Sam Mokorosi, head of origination & deals, at the Johannesburg Stock Exchange (JSE): "Investors continue to be concerned about operational risk, especially in the junior sector. Buying shares of a mining company exposes investors to operational leverage that gives them both a steeper upside and a steeper downside; that operational risk is the highest with early-stage miners."

GBR interviewed a few private companies planning to IPO in the upcoming years, including Rwandan diversified miner Trinity Metals, tin producing, smelting and trading company Woodcross in Uganda, project generator Antler Gold with assets in Namibia and Zambia, early-stage gold junior Red Sea Resources with licenses in Egypt, and Zambian copper explorer Zamare Minerals. Roger Murphy, the managing director of Zamare, looks at the TSX, ASX and AIM as the exchanges most relevant to a junior explorer: "While we know that we will eventually go public, the timing will depend on when market conditions permit, as the last few years have been challenging for junior explorers."

All of these are juggling the old chicken-or-egg decision: consolidating first to be able to get good investment traction but needing investment to be able to consolidate and advance their projects. Other private companies are more inclined to look for a financing partner in the form of a debt, offtake or JV format. Akobo Minerals, a gold junior in Ethiopia, is seeking a partner to help it unlock the broader potential of the region beyond its current asset.

While investor confidence continues to improve, especially for high-performing commodities like gold, we note a growing importance of multilateral financial institutions, development banks, streaming and royalty firms, as well as private equity and venture capital firms starting to fill in the financing gaps in the junior and intermediate sector. Trinity Metals approached the US International Development Finance Corporation (DFC) and was granted US$3.86 million in technical assistance focused primarily on ESG initiatives at its portfolio of projects in Rwanda. Lifezone Metals has also announced the start of a financing process with DFC this year.

The Industrial Development Corporation (IDC) of South Africa has also become more active in the critical minerals space. Giyani Metals, a battery-grade manganese project developer in Botswana obtained a US$16 million convertible loan from the IDC this year. South African copper developer Orion Minerals also has the backing of the IDC for the financing of its Prieska copper project in South Africa, whereas another South African junior, West Wits Mining, secured a pathway for a loan of US$15.9 million from the South African Development Finance Institution (DFI) for its Qala Shallows gold project. While not directly financing mining projects, the Development Bank of South Africa (DBSA) is assisting with mining-related infrastructure; it recently provided ASX-listed Black Rock Mining, a graphite developer in Tanzania, with up to US$60 million towards upgrading the transmission line at the mine site, and is looking at three or four more critical mineral projects in Southern Africa.

"On the debt side, the appetite remains robust from institutions like AFC and other MDBs, especially in sectors where commodity prices have remained stable and where hedging solutions are available. However, political risk remains a key consideration when evaluating these opportunities. This growing interest signals positive momentum, but the need for strategic partnerships and careful risk assessment is essential to unlocking larger-scale projects," commented Franklin Edochie, senior vice president at the Africa Finance Corporation (AFC).

The AFC has announced its largest syndicated loan to date, at approximately US$1.16 billion, and is supported by mandated lead arrangers and bookrunners from across the world, including First Abu Dhabi Bank, Emirates NBD Bank, the Bank of China and Standard Chartered. Among its most recent investments, AFC put US$150 million into the development of the Kamoa-Kakula copper complex in the DRC, as well as providing greenfield exploration support to FG Gold's Baomahun gold mine, the first and largest commercial mine in Sierra Leone. The International Finance Corporation (IFC), African Development Bank Group (AFDB) and the EBRD are also participating more in Africa's resources sector, whether directly in extractive projects or indirectly through infrastructure support. This year, the EBRD has announced expanding for the first time in Sub-Saharan Africa. Annually, the EBRD provides between US$300 and US$500 million across 10-12 projects in the mining industry across its traditional jurisdictions in Europe, Central Asia, North Africa and the Middle East. The next expansion phase will include six new countries in Sub-Saharan Africa (Benin, Côte d'Ivoire, Ghana, Nigeria, Kenya and Senegal) and a bigger share of mining projects within the bank's portfolio.

Vusi Mpofu, sector lead for mining and chemicals at Nedbank, offers a final word from the perspective of a financier: "We are not a seasonal business. In the capital allocation framework, you cannot make decisions based on current macro conditions, but a longer timeframe that spans the life of project must be considered. The mining sector is endowed with a vast history of prudent capital allocation; it survives thanks to this history and culture of being able to make the appropriate capital allocation decisions in anticipation of a future that not everybody sees." ■

Dean McPherson

Head, Business Development – Global Mining
TORONTO STOCK EXCHANGE AND TSX VENTURE EXCHANGE (TSX & TSXV)

How have the TSX and TSXV performed over the past year?
2022 was an extremely difficult year in terms of financing activity and new listings, but the equity capital markets started to improve by the end of 2023, and 2024 kicked off on an upward trend with First Quantum closing a C$1 billion equity bought deal, the largest in Canada's history. This was followed by continued improvement in the mining financing space, particularly amongst the larger issuers, and as the year progressed, we started to see the increased activity spread to the junior, early-stage mining companies.

Can we expect the valuation of juniors to catch up to the high commodity prices we are seeing?
Once geopolitical tensions subside, coupled with the continued reduction in interest rates, no doubt the equity market will catch up to commodity prices' trajectory. Market confidence and increased risk appetite will close the gap.

Are you seeing more appetite for foreign investment in African mining nowadays from non-Chinese players?
The energy transition has certainly highlighted the demand for critical minerals. Africa is one of the most resource rich and underexplored mining jurisdictions. Despite the traditional challenges in many countries in Africa, investors are increasingly realizing there are significant opportunities which may outweigh jurisdictional risks, which may be managed or mitigated in many cases. The Chinese have certainly exemplified this approach in many cases around the world in the past 20 years. Perhaps the best example in Africa is the success of Ivanhoe Mines in partnership with Zijin Mining Group on the Kamoa-Kakula copper project in the DRC. As investors and indeed many Western governments play catch-up to the Chinese, I believe we will continue seeing increased interest and investments in the continent. ■

Kate Galpin

Senior Manager, Listings
AUSTRALIAN SECURITIES EXCHANGE (ASX)

What makes the ASX an attractive option for mining players?
ASX is a global resources hub, with more than 880 companies having a combined market cap of over AU$912 billion (US$611 billion). The resources sector is the largest sector on ASX. It represents about half of all listed entities by number and about one third of the AU$3 trillion (US$2 trillion) total market capitalization of companies listed on the ASX.

ASX is an attractive exchange on which to gain investor attention and raise capital; this is driven by a number of factors. There is a growing pool of capital in Australia which underpins the virtuous circle that helps drive ASX listings. The Australian pension system – locally known as superannuation – is the world's fifth largest with assets just shy of AU$4 trillion (US$2.7 trillion) which are forecast to grow to AU$11 trillion (US$7.4 trillion) in the next 20 years.

For Metals and Mining, ASX is ranked first globally by total market capitalization, IPOs and capital raisings. As a result, the ASX has a deep and highly sophisticated investor base for the resources sector and provides access to a global investor base.

Could you comment on your recent performance in terms of new listings?
There have been over 120 Metals and Mining IPOs on ASX in the past three years raising in aggregate over US$1.1 billion in IPO capital. The resources sector has continued to be highly active, even during the global IPO downturn. In the 24 months to September 2024, 65% of ASX IPOs and 60% of follow-on offerings were in the resources sector.

How is the risk appetite of Australian investors evolving in relation to African resource opportunities?
There are 113 ASX-listed mining companies that own or operate properties across Africa, encompassing a total of 266 properties. Key examples amongst gold miners are Perseus Mining and West African Resources. Both companies have successfully raised additional capital on ASX to fund their growth. ■

Tom Attenborough

Head of International Business Development, Primary Markets
LONDON STOCK EXCHANGE (LSEG)

According to S&P Global, the market cap of London-listed mining stocks has been declining in the past few years. Could you discuss the underlying factors and any initiatives by the LSE to address these trends?
Over 170 mining companies listed in London account for approximately 16% of the total market capitalization of listed mining firms worldwide. This includes a diverse range of companies across different stages of their growth - from the multi-billion-dollar market cap majors to junior miners with sub $100 million market caps. In 2024 we welcomed a number of new listings from Metals and Mining companies, including Rome Resources (a transfer from TSX), ACG Metals, European Green Transition, Helix Exploration and Pulsar Helium. Helix Exploration and Pulsar Helium are dual listings, continuing the trend over the past few years where international mining companies have chosen London as an additional listing venue, enabling them to grow their global profile, expand their investor base and boost liquidity.

The UK capital markets are undergoing the most dynamic set of reforms anywhere in the world right now, to ensure that they continue to serve their purpose of connecting companies with capital and support their growth journey.

Could you provide an overview of the performance of the IPO market in 2024, and outline your strategy for attracting IPOs and secondary listings, especially from African mining operators?
In 2024, we saw 17 IPOs and 360 follow-on issues on the London Stock Exchange, raising US$1 billion and US$31.5 billion respectively. This demonstrates London's continued ability to support dynamic companies across all sectors and from around the globe to raise efficient capital. We will continue to set out the opportunity in London for African miners in 2025, and are pleased to see that Anglo Platinum has announced the addition of a London listing as part of its demerger from Anglo American this year. ■

Sam Mokorosi

Head: Origination & Deals
JOHANNESBURG STOCK EXCHANGE (JSE)

Can you give us a brief overview of JSE's performance over the past year in terms of listings?
In 2023, we saw three new listings but also 15 de-listings. This year (to date), we already had three new listings, with two more approved, and another two or three in the pipeline, which sets us up for about 10 new stocks joining the JSE. The net delisting trend is fortunately starting to slow down in South Africa.

Delisting is a global trend and a result of the heightened concentration in the value chain: as asset managers and stockbrokers get larger and fewer, small-cap firms find it more difficult to get attention and raise capital on the exchange, therefore, they renounce it altogether.

How have fluctuations in commodity prices affected stock performances?
Low prices over the past year have been tough on the South African PGM miners. On the other hand, gold stocks have very good performances. However, investors continue to be concerned about operational risk, especially in the junior sector. We are also seeing more optimism for base commodities like iron ore, manganese and coal, as logistics challenges related to both port and rail are being tackled. Finally, in the critical minerals space, the challenge is that we do not have enough listed battery metal opportunities in South Africa. The JSE is engaging with that part of the market to originate new listings in vanadium, lithium, copper and rare earths.

Could you briefly tell us about JSE Private Placements (JPP)?
We launched this platform about two years ago to help fundraising in the unlisted space, especially for junior mining companies in the battery metals and rare earths space who are looking to raise money but are not ready for listing yet. The JPP has grown into Africa's largest marketplace, with over 12 billion Rand worth of investors. ■

Mohan Vivekanandan

Group Executive: Origination & Coverage

DEVELOPMENT BANK OF SOUTHERN AFRICA (DBSA)

Can you introduce DBSA to our international audience?

The Development Bank of Southern Africa (DBSA) is a South African government-owned national development bank operating under the Ministry of Finance. Its mandate is to develop and finance infrastructure across Sub-Saharan Africa. Over the last financial year, the DBSA financed nearly 1 billion Rand, primarily through long-term debt—both senior and subordinated—offered to private (corporate) and public entities. Recently, the bank launched an equity investment business.

Outside South Africa, the DBSA has expanded into new countries. Highlights include financing part of the Lobito Railway alongside the US DFC, a railway project in northern Nigeria and a hydropower project in Senegal. In Kenya, the DBSA fully financed the debt requirements for Sosian Energy's geothermal project.

Does the DBSA ever finance mining projects directly?

While we do not directly finance mining projects, we are investing in mining infrastructure. For instance, we recently financed the Mahenge graphite project developed by Black Rock Mining in Tanzania, providing between US$50 and US$60 million towards the transmission line upgrades and other infrastructure requirements. We are looking at critical mineral projects in Southern Africa (Tanzania, Botswana and South Africa). ■

Anass Joundy

Associate Director, Lead Banker Natural Resources, South & East Mediterranean Region

EUROPEAN BANK OF RECONSTRUCTION AND DEVELOPMENT (EBRD)

Aya Gold is one of EBRD's largest clients and a great success story. Could you share this story with our readers?

We met Aya Gold in 2013 when it was a small unfunded junior mining company. They were looking for US$9 million to develop the Zgounder asset into a small-scale production. In 2014, we provided a US$6 million loan plus royalty on the production and out of the money warrants, while US$3 million was raised in the stock market. Aya started producing and repaying the loan, their share price on the TSXV started to go up, the warrants gained value, and we began exercising those warrants. Today, Aya is the largest silver company in Africa and its market cap is C$2 billion.

This case illustrates how EBRD can act as a catalyst for project development since our stamp of approval influences others to also trust a promising mining project.

What is EBRD's strategy to expand to Sub-Saharan Africa?

The EBRD's shareholders approved the expansion to six countries in the region, namely Benin, Cote d'Ivoire, Ghana, Nigeria, and Kenya and Senegal. The mining industry will be an important share of our investment portfolio. ■

Franklin Edochie

Senior Vice President

AFRICA FINANCE CORPORATION (AFC)

Is there enough liquidity and appetite in the markets to finance mining projects?

Despite record performances in metals and mining assets, as well as rising commodity prices globally, junior miners are still facing significant challenges in raising equity capital. This financial challenge in the junior mining sector could have long-term implications for the supply chain of key minerals essential to global decarbonization efforts.

That said, strategic players from far east (China in particular) are stepping in strongly with the necessary equity to secure offtake agreements, particularly in critical mineral projects. Meanwhile, the AFC and other multilateral development banks are also stepping up to provide equity capital, but typically for smaller-scale projects in the US$200 to US$300 million range.

What are the main priorities at AFC moving forward?

Sustainability and development impact is central to our strategy. We prioritize projects that incorporate renewable energy sources, minimize environmental impact, and have a positive social footprint. We are especially focused on ensuring that our projects create tangible benefits for local communities, including social development programs and infrastructure that supports long-term growth for project-affected areas.

These key areas of focus—critical minerals, beneficiation, strategic assets, and sustainability—will guide AFC's growth as we continue to support development across the region. ■

Julian Grieve

Co-Head, Resources Sector Solutions

RAND MERCHANT BANK (RMB)

Could you briefly introduce RMB to our international audience?

Rand Merchant Bank (RMB) is a leading African corporate and investment bank and part of FirstRand Limited, one of the largest financial services groups in Africa. We offer advisory, funding, trading, corporate banking and principal investing solutions. RMB has a deal footprint in over 35 countries in Africa, as well as a presence in the UK, USA, India and China.

What sort of projects do you finance? Could you provide some examples?

Our strength lies particularly in unlocking hard transactions. For example, we helped Pan African Resources fund several of their tailing retreatment projects by creating the first sustainability-linked bond listed on the JSE, as part of a hybrid finance structure. Another project we were involved with recently was the phase 2 expansion of the Gamsberg mine, under Black Mountain Mining.

How do ESG standards influence RMB's capital provision strategy?

In the mining industry, our job is a little bit easier in this respect because mining companies have been ahead of the curve in terms of managing their social and environmental footprint. The industry is adding emissions reporting and monitoring as another metric into existing reporting standards. ■

Shirley Webber & Mizinga Melu

SW

MM

SW: Head of Natural Resources & Energy
MM: MD and CEO, Zambia

ABSA

Could you provide a brief introduction to Absa and your role in the mineral supply chain?

SW: Absa is a leading African bank that covers corporate and banking investment. From a commodities point of view, we have been very active in the precious metals space, like rubies in Mozambique and emeralds in Zambia, but also copper and cobalt, supporting multiple players in both Zambia and the DRC. We are also involved in the power sector – in South Africa, Absa has financed more than 55% of the solar and wind MW capacity installed, mostly as part of the government's renewable programs. We also want to play a bigger role in the critical minerals space.

Could you provide some examples of recent project finance that Absa was involved with?

MM: Absa has facilitated investments in First Quantum Minerals' S3 US$1.25 billion expansion which will be commissioned in 2025. On the energy side, we have also banked Genser Energy and Copperbelt Energy Corporation in Zambia, facilitating the inaugural US$200 million green bond in which Absa was one of the anchor investors. Absa was also the only African commercial bank to sponsor Ivanhoe's Kamoa-Kakula expansion in the DRC. ■

Nivaash Singh & Vusi Mpofu

NS

VM

NS: International Mining Finance
VM: Sector Lead, Mining and Chemicals

NEDBANK

Could you share some recent developments in terms of capital allocation over the past few years at Nedbank?

NS: Our portfolio spans precious metals, base metals and industrial metals. One recent trend in our business is the focus on uranium. Every year, we conclude between 15 to 20 structured debt financings, of which at least two will be for the financing of greenfield projects. The remainder are normally in the corporate finance space for existing producers looking to acquire assets or expand existing operations.

VM: Nedbank is also very active in the renewable space, especially in South Africa. Out of the 9.3 MW of projects in progress in South Africa, last year 7.5 MW was from the mining industry.

Has Africa become riskier for investors?

VM: The geopolitical dynamic of risk for the past decade has been that of a scramble for security of supply. China has been highly tolerant of risk, and that is forcing America and Europe to also take higher risks to secure supply and counterbalance China, which already controls a disproportionate amount of supply. This dynamic has resulted in many transactions going through at high premiums. ■

COMMODITIES

“The traditional commodities exported out of Africa are well recognized, but there are new commodities that will likely paint Africa’s future, including iron from the giant Simandou iron ore project, as well as the myriad new opportunities in lithium and other critical minerals."

Karl Cicanese, Managing Director,
LYCOPODIUM MINERALS APAC

Image by Peak Rare Earths

Gold

Playing catch-up with the gold price

> *We started 2024 at a gold price (spot) of around $2,000/oz – an unprecedented level – and yet we continue to see new records. There is plenty of noise in the market about a US$3,000 gold, which would no longer be surprising, but completely fathomable.*
>
> Dave Anthony,
> President and CEO, **Asante Gold**

Gold prices hit a new record at the end of October, reaching a dazzling US$2,788/oz. Supporting the gold rally are the general global instability stoking gold's role as a safe haven; an easing monetary cycle; record high demand for bullion from central banks, reaching 483 t in the first half of the year; and positive ETF flows in both American and European markets. Gold may be one of the best-performing asset classes this year, but mining stocks have yet to catch up to the gold price.

There are several reasons behind this seemingly perplexing disconnect between mining stocks and gold prices. Investors may have felt a price over the US$2,000 mark reached in 2020 is unsustainable. This has been disproved: Four years later, and a US$3,000 gold price looks highly likely. Other investors are seduced by the AI bubble, FTSE top stocks, or the so-called 'magnificent seven' stocks. Those who have followed gold stocks may have also been disappointed in their performance: According to Sprott, gold mining equities have underperformed the metal's price ever since 2011's peak. Another disincentive is dilution through repeat share issuance and poor allocation, which can be difficult for investors to track.

> *Sovereign risk and the penalty on sovereign risk are unfortunate, but that will not always be the case. Governments are starting to understand what it means to have a competitive commodity and investment environment. Investors will reward that maturity.*
>
> André Koekemoer,
> General Manager, **Capital**

But perhaps one of the biggest off-putting factors has been the impact of higher inflation on margins. A recent study by Bain & Company found major mining projects currently run between 15% to 20% over budget globally. Average all-in sustaining costs (AISC) for gold production have grown by 13.6% in the last decade, or from US$1,100/oz to US$1,250/oz, according to Sprott. The timeline between discovery and production – and therefore cash generation – has also increased from six to 10 years in the last decade, according to the same source. Higher risks, whether jurisdictional or emerging from climate change and the ESG paradigm, also contributed to an apathetic sentiment.

However, with gold reaching tipping points, the sentiment is likely to change and gold-stock gains could see an upturn very quickly. American investor Stanley Druckenmiller turned heads when he dumped stocks in Amazon and Alphabet (Google) for Barrick and Newmont. More generalist investors could be drawn in, believes Luke Alexander, president and CEO of Ghanaian gold junior Newcore Gold: "Producing gold companies are seeing a significant amount of free cash flow generation, with every move in the gold price going directly to their bottom lines. This is inevitably going to pull in generalist investors who may not have a consistent focus on the sector but are enticed by the return opportunity."

M&A cycle begins

Gold producers are sitting on a lot of cash, and while they pledge prudence in capital allocation to avoid unfortunate transactions such as those seen in the last cycle, the chronic underinvestment in the gold exploration sector leaves them without alternatives but to hunt for new assets. Bert Monro, the CEO of Mali gold explorer Cora Gold, believes an uptick in M&A has been delayed but will come: "Initially, companies take time to adjust to the price shift and they tend to focus on deleveraging and capitalizing on the higher gold price before committing to new exploration investments. While the gold mining sector is currently very strong and is expected to remain so, we anticipate a few more months of lag in exploration spending. However, I believe we will soon witness an uptick in deal-making and M&A activity as market conditions continue to improve."

A few large transactions have already broken news recently. The biggest gold miners were first to react: Newmont acquired Newcrest for US$19 billion in 2022, and this year Gold Fields purchased Osisko Mining for US$1.6 billion. Both Newmont and Gold Fields have operations in Africa and are diversifying their portfolios across Canada and Australia. AngloGold followed suit quickly, but unlike its two leading peers, it went for an African top-tier producer, Centamin, Egypt's sole gold producer. The US$2.5 billion transaction brings Anglo in possession of the 400,000 oz/y Sukari gold mine in Egypt and the Doropo gold project in Côte d'Ivoire.

One of the most acquisitive gold miners in Africa has been Australian company Perseus Mining, which has three producing mines (one in Ghana and two in Côte d'Ivoire), as well as a development currently on hold in Sudan and a freshly acquired project in Tanzania, the Nyanzaga gold project, which is nearing a final investment decision.

Jeff Quartermaine, Perseus' CEO and managing director, told GBR about the importance of responsible capital allocation: "There are always competing demands for capital, but our mission as a business is to generate fair and equitable benefits for all stakeholders, including

shareholders, our host governments, host communities, and our employees. (...) From a business perspective, delivering significant returns to shareholders is important, but we must also ensure we can meet our obligations and adhere to our long-term growth strategy in a volatile environment."

Perseus has also expressed interest for Newmont's Akyem mine in Ghana, but the asset went instead to Zijin Mining. The acquisition, worth US$1 billion, is the seventh for Zijin since 2020, according to Mining Technology.

In the quest for yield

In the quest for the biggest returns, Africa, and particularly West Africa, offers the highest upside promise in terms of undervalued stocks that are not reflective of the gold price and of promising greenfield targets turning into major mines. West Africa has delivered more ounces, at higher grades, in shorter times, than anywhere else in the world. Permitting times are also shorter, African governments being intent on seeing more mines being developed. 3L Capital noted that West Africa has had the shortest construction timeline since 2010, averaging at 1.7 years. For instance, construction at Tietto's Abujar project started in early 2022 with first gold poured a year later. EPCM firms like Lycopodium boast a consistent track record of on-time and on-budget projects delivered in the region. Lycopodium has worked on some of the top developments in West Africa, including Newmont's

"Gold producers in West Africa are maintaining all-in-sustaining costs in the triple digits, unlike other regions. Despite a 25% increase in gold prices over recent months, investment in exploration remains restrained. Political and security instability may contribute to this."

Martin van Gemert, Regional VP Africa,
Mincon

Ahafo North in Ghana, West African Resources' Sanbrado in Burkina Faso, Perseus' Sissingué and Endeavour Mining's Lafigué projects in Côte d'Ivoire, and Endeavour's Sabodala-Massawa expansion project in Senegal. Most recently, it was involved with FG Gold's Baomahun project in Sierra Leone.

Both discovery and operating costs have been reportedly lower compared to other jurisdictions. Endeavour boasts a discovery cost of US$12/oz for its newest mine in Côte d'Ivoire, Lafigué, which poured first gold this year. Lafigué will also produce at an AISC below US$1,000/oz, which is not uncommon in West Africa. In fact, four out of the top 10 lowest-cost gold producers operate in the continent: Perseus Mining and Endeavour Mining, both with mining operations exclusively in West Africa, are in the third and fourth place, respectively, whereas Barrick and Kinross have mines in West Africa and came eighth and tenth place, according to a report by Kitco News.

But the biggest returns are probably in the junior sector, where many companies are currently undervalued and can expect rapid appreciation in their share price as projects advance. For instance, Perseus came into the possession of 9.9% shares in Montage Gold through its acquisition of Orca Gold (previous shareholder in Montage) in 2022. At that time, Montage's shares were trading at around 60 cents/share. Today, the share appreciated to almost CAD2, providing Perseus with a profitable exit. Perseus swapped its 9.9% shareholding in Montage's Koné gold project in Côte d'Ivoire for a 19.9% stake in Predictive Discovery's Bankan gold project in Guinea. Perseus bought the Predictive shares from Capital. For Capital, Predictive was also a good vehicle for returns, Predictive's share price appreciating by 2,600% in the last five years.

"This kind of return is not easy to achieve in more advanced, supposedly de-risked assets. It is puzzling why there isn't more funding flowing into the early-stage sector, but I believe it will eventually happen. The mining sector is relatively small compared to other industries, so even a modest increase in capital could significantly lift the industry," said Martin Pawlitschek, the CEO of Sanu Gold, commenting on the recent Capital pull from Predictive.

Large projects with a high probability of being turned into mines are the market's favorites. West Africa has plenty of project opportunities in the 4 million oz plus resource range. Predictive Discovery's Bankan has an inferred resource of over 4 million oz – bigger than most in the region – and could become Guinea's biggest gold mine. Sierra Leone also surprised the market with a top-tier discovery, the impressive 5.81 million oz Baomahun project, developed by FG Gold. This would be the country's first commercial scale mine. Montage Gold, whose main shareholders include the Lundin Group and, more recently, Zijin Mining, is looking at 4 million oz in reserves from its Koné project in Côte d'Ivoire. The company is launching a 60,000 m drill program to continue expanding the resource base. Technical studies of many of these mines under development in West Africa estimate AISCs under US$1,000/oz.

"Once you have punched through that US$50 million to US$100 million market cap range, the investment size for institutions does not give you more than 5%-10% of your equity, since they have their own caps. You need a long-term vision to put together something of scale."

Andrew Chubb, CEO,
Awalé Resources

For those advanced explorers with smaller assets in the ground, increases in the gold price improve project economics and ultimately their valuations. For instance, Newcore used a reference price of US$1,850/oz gold for its 2024 PEA at the Enchi gold project, but with every US$100 increase in gold price, its after-tax NPV increases by US$50 million, while its payback time is also reduced. Enchi currently has 743,500 oz (indicated) and another 972,000 (inferred). In Mali, Cora Gold published its DFS in 2022 using a reference gold price of US$1,750/oz, for which its 1 million oz Sanankoro project would generate US$71.8 million in free cash flow in its first year of operation and US$234 million over its 6.8-year life of mine (LOM) at an average production guidance of 56,000 oz/y.

The right neighborhood

As per the latest figures published by the World Gold Council, the biggest 10 gold-producing countries in Africa are Ghana (135.1 t/y), Mali (105 t/y), South Africa (104.3 t/y), Burkina Faso (98.6 t/y), Sudan (72.5 t/y), Guinea (64.9 t/y), Tanzania (52 t/y), Côte d'Ivoire (51.5 t/y), Zimbabwe (46.6 t/y), and the DRC (45.4 t/y). This ranking has evolved considerably over the past years. The most dramatic change has probably occurred in South Africa, whose gold output declined from 170 t/y in 2012 to 104 t/y today; at the opposite end of the spectrum sits Côte d'Ivoire, whose gold output increased from a negligible 12 t/y to 51 t/y over the same period. While South Africa's gold mines are mostly brownfield and can go to a depth of 4 km (Harmony's Mponeng gold mine at 8.43 g/t grade holds the Guinness world record for the deepest mine), Côte d'Ivoire boasts close-to-surface deposits, typically at a medium-grade quality.

"Côte d'Ivoire is a place where big elephants are hiding," said Pe-

28 >>

Jeff Quartermaine

Managing Director and CEO

PERSEUS MINING

Can you comment on the company's performance in FY2024?

We had a strong year across all aspects of the business. Perseus produced nearly 510,000 oz of gold at AISC of just over US$1,000/oz, resulting in exceptionally high margins at current gold prices. We ended the year with a profit after tax of US$365 million, up 14% compared to last year, an operating cash flow of US$429.2 million, and approximately US$587 million of cash and bullion on the balance sheet. Our strong financial position enabled us to implement two key initiatives. First, we have steadily increased our dividend since FY21, when we first began paying dividends, with the total dividend this year at 5 cents per share. Secondly, we initiated an inaugural share buyback. These two initiatives combined generated a yield of 4.2-4.3% based on the share price at the end of last year, so our long-term shareholders have seen significant returns over and above material growth in the Company's share price.

Given Perseus's strong financial position, what are your primary focuses for capital allocation?

In recent years, Perseus has been fairly acquisitive, acquiring the Meyas Sand gold project in Sudan and, more recently, the Nyanzaga gold project in Tanzania. We aim to make an investment decision on Nyanzaga by December this year, with the goal of developing the project in early 2025 and commencing production in 2027. Additionally, we recently swapped our 9.9% shareholding in Montage's Koné gold project in Côte d'Ivoire for a 19.9% stake in Predictive Discovery's Bankan gold project in Guinea.

What attracted Perseus to Tanzania?

In our view, the country has turned a corner under President Samia Suluhu Hassan, who has done an outstanding job of rebuilding Tanzania's attractiveness for investment. Our experience so far has been first-class, with meaningful support from the government.

What should investors expect from Perseus Mining in the coming year?

With very interesting projects ahead of us, our shareholders can look forward to a steady stream of positive news from Perseus in the next year. ■

Peter Marrone

Chairman and CEO

ALLIED GOLD CORPORATION

Could you briefly introduce Allied Gold Corp?

Allied Gold is a mid-size gold-producing company with a production platform of between 375,000 to 400,000 oz/y of gold. However, our growth platform, both in terms of outputs and financial measures certainly punches above the weight class of a mid-tier: Our cornerstone assets, the Sadiola gold mine in Mali and the Kurmuk gold project in Ethiopia are world-class. Sadiola has a current guidance of around 200,000 oz/y, but once our plant expansion is complete, we can take it closer to 400,000 oz/y with an initial LOM of 19-20 years. Meanwhile, Kurmuk will start at between 250-300,000 oz/y for an initial LOM of 11-12 years out of the current Mineral Resource inventory of approximately 3.6 million oz, with immense exploration upside. I would not want to diminish the significance of our Ivorian assets, where we acquired two separate but adjacent mines, each with a production profile of roughly 90-100,000 oz/y.

Could you elaborate on the upside potential?

With the expansion of Sadiola and the development of Kurmuk, we are positioned to reach 600,000 oz/y by 2026 and over 800,000 oz/y by 2029. By mid-2026, Kurmuk will become our largest producer, but once the expansion of Sadiola is complete, the two mines will compete neck to neck as the leading producer and cash generator for the company.

Allied Gold Corp has signed a protocol agreement with the Malian government. Could you explain?

We took a sanguine look at this change on what this means for the economics of the project. Our position was that, instead of enforcing our rights within the existing convention available through 2037 and recourse to our arbitration or mediation clauses, we are better off finding a bonafide win-win between ourselves and the state to be able to move forward and develop more transparency and good faith. The agreement provides for the renewal of the mining permit for the Sadiola mine and the development of the Diba deposit, following the derogations of the new mining code (2023). ■

Praveen Baijnath

CEO

RAND REFINERY

"Rand Refinery is one of the world's leading gold and silver refiners and an operator of one of the continent's largest low-grade gold recovery smelters."

Could you please introduce Rand Refinery and its role in localizing the gold supply chain in the continent?

Rand Refinery is one of the world's leading gold and silver refiners and an operator of one of the continent's largest low-grade gold recovery smelters.

The refinery can refine and provide the necessary assurance for refinery deposits from 25% Au and upwards (typically mine dore and electrowinning sludge). Our smelter operations deal with complex low-grade materials (low-grade mine waste such as borax slag, gold-containing carbons, and refinery sweeps) ranging from 300 g/t Au upwards. Our history and experience in dealing with complex and different types of by-products and mine doré deposits are critical in the sampling and assaying processes, as precise content reflection for the depositing customer is of paramount importance.

Our products include Good Delivery bars, kilobars, minted bars, coin blanks, and value-added products, which are part of our signature offerings, including the world's most widely held and actively traded gold bullion coin, the Krugerrand (with Prestige Bullion). With value-added products from Rand Refinery used globally in jewellery fabrication and industrial applications, the consumers of these products are ensured that this gold is responsibly sourced – in some instances, provenance data is supplied to select customers.

Accordingly, our gold comes from responsible producers who have implemented ESG targets and sustainability principles. Not only do we ensure we meet the strictest standards we set for ourselves, but our Certified Gold's entire chain of custody is independently audited to heed the requirements set by independent bodies and recently enacted legislation.

What are recent developments and milestones?

As a further measure of our commitment to sourcing and producing ethically, we've developed the RandPure® mark. An iconic symbol of our pursuit of pure refinement, it guarantees the provenance, fineness, and exceptional quality of the precious metal it endorses.

What are the areas that Rand Refinery is looking at to reduce its carbon footprint, encourage recycled gold, reduce water consumption etc.?

One of the most significant steps Rand Refinery has taken is its shift towards solar energy.

We aim to exclusively use renewable energy sources (mainly solar) for our refining operations by 2027, except for the smelter, which will remain grid-operated.

Equally important has been our focus on water conservation. Our initiatives to reduce water use and enhance recycling processes demonstrate a commitment to preserving vital resources in an industry that consumes large quantities of water.

Recycling is a key business practice that shapes our approach. We have set a bold target to reduce waste by 50%, decreasing annual waste from 60 t/y to 30 t/y by enhancing the repurposing of recyclable materials.

Our approach to ESG also shares a robust focus on social elements. Between 2021 and 2023, we invested over R7.8 million in educational enhancements at local schools. The donations are part of a series of planned contributions focusing on academic support and community development projects.

We are deeply committed to the community in which we operate. The Gold Zone, located on our premises, functions as a dynamic hub for training the youth in jewellery design, manufacturing, and skills development. Known as the Jewellery Village, this area is home to several businesses engaged in jewellery manufacturing, providing employment and fostering the development of local beneficiation capacity.

Our Silver and Gold Mentorship Programmes, established in partnership with the Ekurhuleni Jewellery Project (EJP), NQ Jewellers, and the South African Diamond and Precious Metals Regulator, have seen remarkable successes since inception in 2021. Since 2022, the programmes have celebrated the graduation of 42 Small, Medium, and Micro Enterprises (SMMEs).

This year, we have enhanced the SMME curriculum and introduced personal coaching for sustainable start-up businesses. We remain committed to nurturing a diverse talent pool in a promising but underinvested industry.

Our participation in the London Bullion Market Association's (LBMA) Gold Bar Integrity programme and World Gold Council mine traceability is a significant step. These programmes aim to digitally monitor gold moving through the global supply chain by confirming provenance and providing transparency over the chain of custody.

The LBMA and World Gold Council have also introduced the Gold Industry Sustainability Principles, mandating refiners to show ongoing progress. Rand Refinery is currently set to achieve 80% of the requirements outlined in these established industry principles.

The international success of our RandPure gold bars, especially in a demanding market like India, highlights the competitive advantage of integrating ESG principles into core business strategies. RandPure gold is 100% ethically sourced and has completely traceable origins. ■

<< 25

> *"Unlike traditional junior explorers, our project generator model allows us to leverage partnerships and joint ventures to advance projects. We retain significant upside through equity positions, royalties, and other interest structures while minimizing dilution."*
>
> Christopher Drysdale, CEO, **Antler Gold**

ter Ledwidge, founder and managing director of Mako Gold, a junior explorer advancing the Napié gold project in the country. "One of the beauties of working in the region is that you can be in production within five to six years from the first discovery hole, something you will not find anywhere else. Also difficult to stumble upon in other jurisdictions are open-pitable deposits. Even in places like Kalgoorlie, Val-d'Or and Timmins, most discoveries are underground. In West Africa, exploration costs are lower, and if my audience was a room full of brokers, I would invite them to look at this African discount," he continued.

With Côte d'Ivoire maturing into a prominent gold producer with a higher concentration of interest and fewer licenses available, explorers are finding in neighboring Guinea a 'new Côte d'Ivoire' – an underexplored terrain full of potential. This potential was demonstrated by the 5.38 million oz Bankan project by Predictive Discovery, considered the largest gold discovery in West Africa in the last decade. Guinea has three main gold mines, Siguiri operated by AngloGold, Lefa operated by Nordgold, and Kouroussa, operated by Hummingbird Resources. The exploration sector is getting busier, however. Sanu Gold, Asara Resources (formerly Golden Rim) and Alma Gold are some of the new entrants.

Other parts of Africa are also luring in gold explorers. Often, it is the same companies spreading their risks through assets across multiple countries, something that the majors and mid-tiers have successfully been doing as well. Egypt, Sudan, Eritrea, Ethiopia and crossing over to the Arabian peninsula to Saudi, are believed to be the last large piece of underexplored gold geology, but companies in this part of Africa remain scattered. ■

Highlighted Projects

Image by Endeavour

Senegal — Thor Explorations' Douta and Douta West gold projects

"With the acquisition of the Douta West license in Senegal, we have a contiguous landholding where we have defined a 1.78 million oz resource - a significantly larger prospect compared to our Segilola deposit in Nigeria."

Segun Lawson, CEO, **Thor Explorations**

Ghana — Newcore Gold's Enchi gold project

"We have identified 25 exploration targets to date, of which only five of them are currently included in the PEA and MRE, leaving 20 additional targets for future growth. Our current deposits also all remain open along strike and at depth."

Luke Alexander, President and CEO, **Newcore Gold**

Egypt — Ankh Resources' Dara gold-copper concession

"Our preliminary findings indicate that Dara exhibits high grades of both copper and gold, suggesting substantial mineralization potential. While our results are still under evaluation, they may align with a robust mineralization system indicative of a Tier 1 discovery."

Mostafa Talaat, CEO, **Ankh Resources**

South Africa — Theta Gold Mines' Transvaal Gold Mining Estate (TGME) project

"The project contains 6 million oz of gold resources to date. In the first phase, we are targeting 1.2 million oz (from 6.46 million t @ 5.95 g/t Au) production for 12 years from four out of the 43 mines. We already completed a feasibility study and the required permitting, and we are now at a funding and project execution phase, having started on the final design works with the build teams on site."

Bill Guy, Executive Chairman, **Theta Gold Mines**

Côte d'Ivoire — Montage Gold's Koné Project

"We have 4 million oz of probable reserves with lots of room to grow, a production scale of over 300,000 oz/y in the first 8 years of the life of mine, and a low AISC of US$998/oz over a total mine life of 16 years."

Martino De Ciccio, CEO, **Montage Gold**

Copper

Conductivity to Africa

Image by BHP

No other metal can be said to enjoy such universal appeal as copper does today. Copper is used in everything from traditional fossil-fuel power plants to solar panels, windmill turbines and nuclear plants; from conventional internal combustion cars to components of the electric vehicle; and from the oldest applications in construction to the most high-tech uses in AI infrastructure. Copper fits in the future as steadily as it has fit in throughout its 6,000 years being used by humans, turning gradually into the third most used metal today. Now, copper is evolving past its relevance as a barometer of economic activity, securing a position as potentially the biggest winner of the energy transition as it has become indispensable for both an old and a new economy, an economy that is electrified and digitized. This universality makes demand less elastic to global cycles.

Analysts read copper's recent record performance, with copper futures hitting US$5.20/lb, as a harbinger of a supercycle. While speculators betting on higher values do influence the metal's price, copper is underpinned by matter-of-fact structural market conditions. The International Energy Agency (IEA) projects copper demand to rise by 50% by 2040 in a net-zero emissions scenario, with a market value of US$330 billion, the highest among energy transition minerals. According to the IEA, the world will require 40.7 million t/y of copper in 2040, outstripping the available supply of raw copper by 25.9 million t/y. The AI boom alone could amplify copper demand by 1 million t/y by 2030, according to an analysis from commodities trading group Trafigura.

What differentiates copper from other minerals linked to the energy transition, like lithium, is the size and nature of the supply market. Unlike lithium, which has a small volumetric demand and narrow supply base, triggering huge reactions in price (boom and bust), copper is one of the most mined metals by volume and has a diversified supplier base, defined by large, multi-generational assets managed by the leading miners. The capital-intensive nature of the business as well as the long lead times make it a slower, heavier industry with higher-entry barriers. When a deficit is in sight, it tends to be large and difficult to fill, which is why analysts speak of a supercycle rather than using more fleeting terms like 'bubble' or 'boom'. The IEA estimates the supply risk at 31% (medium). Recent closures, like First Quantum's abrupt mine close in Panama, or the ban on Russian copper deliveries on the London Metals Exchange and Chicago Mercantile Exchange heightened that risk. While the current refined market remains balanced, a squeeze seems imminent, at least in the longer term.

"For the past decades, we have always looked at China as the single most important driver for economic growth and therefore for base metal demand, however, demand for copper is shifting somewhat back to Western economies."

John Wilton,
CEO and President, **BeMetals**

The mining industry is eagerly turning to copper. BHP's offer for Anglo American's copper assets in Peru and Chile put the spotlight on the red metal. Anglo has since announced a massive restructuring, prioritizing its copper and iron ore assets while selling its coal and demerging its platinum and diamonds operations. Teck Resources has also sold its coal steelmaking business to Glencore for US$9 billion last year while doubling down on copper projects. Gold miners are also fixating on copper. The second-largest gold producer in the world, Barrick, announced it wants to double its copper output in the coming years. Barrick has since made a US$7 billion investment in a Pakistan copper project as well as a major expansion at its Zambian mine. In Africa, coal miner Exxaro and PGM South African players Sibanye Stillwater and Impala Platinum have shown interest in copper deposits.

Africa's copper pitch

Globally, copper supply comes mainly from Latin America (Chile, 23% and Peru, 10%), and Africa, the DRC taking the lion's share of the market at 14%, followed by Zambia at 4%.

Africa offers two key zones for copper mining. One is the Central African Copperbelt, which stretches from the Katanga Province of the Democratic Republic of Congo through to the Northwestern Province of Zambia. This Copperbelt is recognized by geologists as the largest mineralized sediment-hosted copper province. The second, less explored belt, is the Kalahari Copper Belt, trending across northern Botswana in a northwest direction into Namibia.

Within the Central African Copperbelt, the DRC has distinguished itself the most in recent years, with 65% of newly announced copper reserves identified worldwide in 2023 coming from DRC's Katanga Basin, according to S&P. The biggest discovery was Ivanhoe's Kamoa-Kakula, expected to produce this year between 440,000 and 490,000 t at a C1 cost between US$1.50 and US$1.70/lb. The addition of a third concentrator will catapult Kamoa-Kakula to more than 600,000 t/y – making it the third largest copper mining operation globally. Other major operations in the country include Glencore's Mutanda Mining (MUMI) and Kamoto Copper (KCC); CMOC's Tenke Fungurume; ERG's Comide and Frontier mines; China Molybdenum's Tenke Fungurume Mine (TFM); and MMG's Kinsevere mine.

Zambia has trodden behind the DRC, an uncomfortable change after once being the top copper producer in the continent. The government wants Zambia to regain that spot, with plans to grow the copper output to 1 million t/y by 2027, and to 3 million t/y by 2031. This may sound overly optimistic considering Zambia only produced 699,000 t/y in 2023, its lowest in 14 years. However, several multi-billion investments underway provide reason for hope. Barrick's current US$2 billion expansion at Lumwana will see the asset grow from 118,000 t/y to 240,000 t/y in 2028. In 2022, First Quantum also announced a US$1.25 billion expansion at Kansanshi, which would expand the life of mine until 2040. The Canadian miner accounts for most of Zambia's copper production. Its Sentinel mine produces over 200,000 t/y and Kanshansi over 130,000 t/y. Vedanta also wants to restart the Konkola underground mine, where operations had halted through a long legal battle with the previous government.

New actors are also entering the market. One development that made headlines is the recent discovery made by KoBold Metals, an AI-driven Californian startup backed by Bill Gates and Jeff Bezos, at the Mingomba copper project in Zambia. Zambia's president, Hakainde Hichilema told the press the company plans to invest US$2.3 billion to develop the project, which could produce 300,000 t/y of copper – the biggest in the country.

"It is encouraging to see that more exploration and development activity has sprung across the continent, in regions that did not previously command the same interest. The uptick in copper prices has also given rise to new JVs and partnerships, with more capital flowing into the continent."

Raksha Naidoo, CEO,
The Particle Group (AMIS & CDN)

"We see a new thrust of exploration interest, especially in Africa, which is emerging as an epicenter for critical minerals. Our country mapping programs will play a key role in opening new doors for exploration and rewriting the world's mineral map."

Ben Young, Business Development Manager (Africa and the Middle East),
Xcalibur Smart Mapping

Abu Dhabi-based International Resources Holding (IRH) also entered the Zambian copper scene after buying 51% of Mopani Copper Mines for US$1.1 billion last year. The miner made a subsequent bid for the Lubambe mine, also in Zambia. On the exploration front, Galileo Resources, Zamare Minerals, Be Metals, Midnight Sun Mining, and Mimosa Resources are looking at Zambian development projects.

The second region of copper exploration is the Kalahari belt, covering Botswana and Namibia. This is a region of mostly juniors, with only a few mines: Khoemacau and Motheo in Botswana, and Kombat in Namibia. The bidding for Botswana's Khoemacau copper mine last year drew in diverse interest from coal companies (Exxaro) and platinum companies (Implats, Sibanye Stillwater). Copper producer MMG eventually sealed the US$1.9 billion deal. Khoemacau produces about 60,000 t/y of copper and 2 million oz/y of silver. The new owners believe they could more than double copper output. Botswana's second mine, Motheo, is owned by a subsidiary of ASX-listed Sandfire Resources, which is looking at an expansion. Botswana has primarily attracted attention for early-stage opportunities: BHP shook hands with copper explorer Cobre, a successful participant in the BHP Xplor program, to look for copper-silver deposits in the country. Other explorers looking for opportunities in the country include Kavango Resources and Aterian, both at an early stage.

On the other side of the belt, Namibia is also seeing increased copper activity. The country, primarily known for its uranium riches, saw the restart of the Kombat mine after 14 years of closure under Trigon Metals, a Canadian explorer. Trigon acquired the Kalahari Copperbelt project this year, expanding its footprint in the country. Another TSX-V listed player, Koryx Copper, is also progressing with its flagship Haib copper project, previously owned by Rio Tinto and Teck Resources (the latter remaining an important shareholder). Koryx is focused on drilling to improve grades, currently at between 0.47% and 0.49% copper. Omico Mining Group is also working towards a BFS at the Omitiomire copper project in the country, while Consolidated Copper Corp has acquired brownfield assets that it plans to re-open.

Outside of these two major belts, South Africa is also home to copper prospects. Previously operated by Rio Tinto, Palabora is the country's only copper mine, held by HBIS. Two junior miners advancing new copper outputs in the country are newly JSE-listed Copper 360 and ASX-listed Orion Minerals. Meanwhile, Angola enters the conversation on African copper after Ivanhoe announced last year taking greenfield prospecting rights over 22,195 km² in the Moxico and Cuando Cubango provinces, which present Kalahari and Karoo volcanics similar to what they see at Kamoa-Kakula.

Within this plethora of opportunities, the most promising copper jurisdiction is probably the DRC, which boasts not only the most recent and sizeable discoveries but also very high grades, with Kamoa flaunting a 6% grade in the first five years, which is highly attractive in a market tormented with decreasing grades. The DRC also offers something that no other major mining jurisdiction does: the shortest lead times. According to S&P Global, the DRC's average interval between discovery to production is the second-shortest in the world (15

36 >>

Sonia Scarselli

Vice President

BHP EXPLORATION & BHP XPLOR

*Sonia is now EVP Exploration for Endeavour Mining

Could you provide an overview of BHP Exploration?

The role of BHP Exploration is to identify top-tier, multi-generational resources, similar to our current assets.

In Africa, where conditions on the ground are improving, we have already invested in two companies in Botswana through the Xplor program and are actively seeking additional opportunities. Commodity-wise, BHP has a solid foundation in iron, coal, nickel and copper, but our goal is to double our portfolio in future-facing commodities, namely copper and potash.

Could you introduce the BHP Xplor accelerator program?

In the game of exploration, you must be a first-mover, yet no matter how big or talented our global team at BHP Exploration is, it is impossible to track every geological idea and opportunity worldwide. This is how the Xplor program was born: We wanted to tap into a larger pool of experts with local knowledge outside of the areas we were most comfortable in, get there before anybody else, and build ourselves through partnerships to ultimately grow our portfolio. There are thousands of junior companies, and the Xplor program allows us to screen large amounts of opportunities (we have had over 750 applicants in the first two years of the program) and identify the best. More than that, by having the selected cohort join us for six months, we get a good window of time to understand how the company operates and how we can best work together. I think of the six-month accelerator as dating before you get married; at the end of the 'dating' period, we decide whether we will 'marry' or not. Most mining companies have been there, entering a JV that turned into a failure because of the missing cultural fit or other issues. ■

Marna Cloete

President

IVANHOE MINES

What are the updates at the Kamoa-Kakula's Phase 3 concentrator?

The Kamoa-Kakula's Phase 3 concentrator was completed ahead of schedule on May 28, 2024. The Phase 3 concentrator is expected to produce approximately 150,000 t/y of copper. With the addition of the Phase 1 and 2 concentrators, total copper production capacity at Kamoa-Kakula is projected to exceed 600,000 t/y, positioning it as the third-largest copper mining operation globally.

We are also in the process of constructing Africa's largest smelter, that will have the capacity to produce 500,000 t/y of >99%-pure blister-anode copper. The direct-to-blister flash smelter is being built adjacent to the existing Phase 1 and Phase 2 concentrator plants.

Could you comment on Ivanhoe's long-term strategy in terms of developing a diversified asset base?

Our tier-one assets in Africa will be strategic, long-life suppliers of critical metals for future generations. The DRC is quickly becoming a pivotal player in the production of critical green copper and Ivanhoe Mines is committed to unlocking the full potential of the DRC's endowment through our ongoing exploration efforts.

Our tier-one Kamoa-Kakula Copper Complex is one of the world's largest, highest-grade copper discoveries.

Next door sits our Western Foreland exploration licenses, where the exploration team is targeting Kamoa-Kakula-style copper mineralization. The Kipushi Mine, also located in the DRC, is one of the highest-grade zinc projects in the world.

South Africa's rich mining heritage and established infrastructure provide a solid foundation for the Platreef project's development. The diversification into PGMs aligns with the growing demand for these metals in various industrial applications, including catalytic converters and hydrogen fuel cells.

Ivanhoe Mines' long-term strategy of jurisdictional and commodity diversification is a robust approach to ensuring sustainable growth and resilience in the face of market fluctuations. ■

Carol Maile

Company Secretary

PALABORA MINING COMPANY

Can you give us an overview of the Palabora mine, the only copper mine in South Africa?

Palabora transitioned from an open pit to an underground (block cave) mine in 2003 through Lift I block, at 400 m below the pit. We are now moving further underground to access the ore through the Lift II block cave development to move another 450 m below the Lift I point and extend the life of mine of Palabora asset by another 15 years.

We are currently mining approximately 30,000 t per day from our Lift I underground operation, at average grades of 0.45% Cu eq. The ore goes through a concentrator for crushing and milling, resulting in a grade of 30%, before it goes through the smelting complex, where we produce approximately 480 t per day at 98% copper content. Anodes are then produced in the refinery, where we produce approximately 420 t per day also at 98% copper content. We also have a rod conversion, selling rods as a final product to the markets.

Can you elaborate on the socio-economic impact Palabora has on the Limpopo region?

Palabora has approximately 3,000 permanent employees of which 80% are from the five surrounding villages in the area, and, as part of the Lift II development, we hire another 4,000 employees on a contracting basis. As a commitment to empowering local communities, we established the Palabora Foundation, an NGO focused on developing people's potential by providing them with the skills and opportunities required to succeed through our four core programs: Business Development, Skills Development, Education, and Community Health. PMC makes financial contributions to the foundation every year. We also work closely with the municipality and have been involved in several infrastructure projects such as building roads and schools. Moreover, we established a local 24/7 clinic to give a first point of assistance to patients since the nearest hospital is 100 km from Palabora. ■

Moses Banda

Country Director

VEDANTA RESOURCES (KONKOLA COPPER MINES/ KCM)

Can you provide an overview of Vedanta's assets in Zambia?

Konkola Copper Mines is one of the largest integrated copper producers in Africa. We operate in four towns in Zambia. In Nampunduwe our Nampunduwe underground pyrite mine and concentrator is a central asset for the entire local economy. The rest of our assets are in the Copperbelt province, in Nchanga, where we have the Nchanga underground and open-pit copper mining operation, as well as two concentrators where we process most of the pyrite from Nampunduwe. In Chililabombwe is our Konkola underground mine and concentrator, as well as our Konkola Deep Mining Project (KDMP). Finally, our refinery and our Industrial Training Center are in Kitwe.

What are your perspectives on regaining control of KCM and the steps to rebuild trust with stakeholders?

In 2019, KCM was put under provisional liquidation, and the administration back then claimed that the relationship between Vedanta and the government had collapsed and that Vedanta had lost its social license. For the next four years, we engaged various stakeholders to explain the government's decision and their inadequate understanding of business considerations during a commodity downcycle. A low-price environment is not conducive to expansionary actions. Our actions were perceived as an abandonment of the assets. We spent a great deal of time talking to our employees, suppliers, and communities to help them understand we are not as we have been portrayed. We are working hard to restore our social license.

Could you update us on the work Vedanta is undertaking to reawaken the assets?

People tend to say that Vedanta managed to regain control of the assets, but in reality, the assets have been run down to the extent of becoming liabilities. Our work has been therefore to restore these mines into being assets. We are undertaking a strategic optimization study to ramp up production to 300,000 t/y in the next three years. ■

<< 33

years), after Laos. By contrast, Zambia has the longest lead times to production, at 34 years, followed by the US and Canada.

Stumbling blocks

On the other hand, atrophied infrastructure and fiscal uncertainty make the Central African region something of a wildcard for investors. Africa only accounts for 8% of the world's total railway length, and the majority (80%) of freight is transported by road, according to African Global Logistics.

Historically, the mining industry has been a strong catalyst for pit-to-port rail investment. Today, the West-East competition for mineral supply sends money to both westbound and eastbound railway lines. For instance, the US is funding a portion of the 1,300 km colonial railway revamp connecting the port of Lobito in Angola to the copper mines in Congo. The project is known as the Lobito Atlantic Corridor and operated under commodities trader Trafigura. While US investors want to ensure connections to Lobito, a getaway port for the Atlantic, China pledged US$1 billion to refurbish an east-bound railway going to the Dar es Salaam port in Tanzania, the getaway to China.

Energy is another big issue for copper projects. In the DRC, the grid is 95% powered by the country's rivers, which allows companies like Ivanhoe to reduce the total emission footprint. Zambia also draws a big part (80%) of its power from hydro plants, but climate change and weather patterns are threatening the country's water – and therefore energy - supply. 1,000 MW out of the country's 3,800 MW hydropower generation is taken down due to severe droughts and evaporation at Lake Kariba. Mining uses half of Zambia's power, according to the London School of Economics' International Growth Centre (IGC) report, so the industry must look for alternatives, either by importing electricity or investing in self-generation. This year, Zambia's largest miner, First Quantum, has entered a partnership with Chariot and Total Eren to develop 430 MW of solar and wind power for its two mining operations in the country. That sort of solution may not be available for a smaller miner.

Lastly, a complex ore body, a lack of continuity across multiple targets, tough mineralogy, or low grades are also important aspects harder to overcome by junior miners. For instance, at the Haib copper project in Namibia, former operators Rio Tinto approached the project like a Chilean porphyry deposit, conducting vertical drilling spaced widely. According to Pierre Léveillé, Koryx's executive director: "Haib is around 1.8 billion years old, having undergone many geological transformations, resulting in a complex structure with faults, shear zones, and quartz veins, which are less common in Chilean deposits. Rio Tinto's drilling was vertical with a wide spacing of 150 m, which likely caused them to miss much of the mineralization since most structures at Haib are vertical or sub-vertical. (...) By mapping these structures and drilling across them, we discovered extensions of 150 to 200 m with grades between 0.47% and 0.49% copper, and even up to 3.95% in smaller sections."

Technology can help too. KoBold used AI tools at its recent Zambian discovery. The company has agreed to provide its tech expertise to Midnight Sun Resources, as part of a JV for Midnight's Dumbwa license, where the company identified soil anomaly with good intercepts across a long strike but has not managed to connect the tonnage. KoBold offered to reinterpret the data using its technology.

Sonia Scarselli, former vice president of BHP Exploration & BHP Xplor, believes there is a great opportunity in the potential for technology to revolutionize exploration. Speaking from her experience in both the oil and gas industry and in metals, she said: "One of the industry's key opportunities is to adapt existing geophysical technologies from the oil and gas sector and apply them to mineral exploration, for example, using passive seismic methods for sedimentary copper deposits or high-grade IOCG-type deposits. At BHP, we have successfully applied these technologies in some of our discoveries in Southern Australia. We can utilize existing datasets to build predictive tools in areas where direct data may not be available (...) We are also creating machine learning tools that essentially train the system to act like a 'mineral system brain,' capable of interpreting information and identifying regions with the highest potential for large-scale mineral discoveries." ■

Highlighted Projects

Image by Radwan Menzer at Pexels

South Africa — Orion Minerals' Prieska project

"We introduced the concept of early production, which will bring us into production up to 3 years earlier than originally anticipated. The finance secured from the Industrial Development Corporation and Triple Flag Streaming Finance allowed us to establish the site with all the services required to run a startup mining operation."

Errol Smart, CEO, **Orion Minerals**

Namibia — Koryx Copper's Haib project

"Following the 2024 drilling program, we announced an updated resource statement: 414Mt @ 0.35% Cu for 3,216 Mlbs Cu at 0.25% cut-off indicated resource. We plan another resource estimate in March 2025, followed by an updated PEA in April. By October 2025, we aim to have a PFS with reserves for parts of the deposit."

Pierre Léveillé, Executive Director, **Koryx Copper**

Zambia — Zamare Minerals' Ntambu, Dongwe, Kalene Hills, and Murundi projects

"Our assets are located on the Zambian side of the Central African Copperbelt, the world's largest and highest-grade copper-cobalt province, with each asset exhibiting different mineralization styles and characteristics. Ntambu is our most advanced asset and is located in the Western Domes region. Ntambu is contiguous with First Quantum's Sentinel and Enterprise mines."

Roger Murphy, Managing Director, **Zamare Minerals**

Battery Metals

Nickel, Lithium, Graphite, Manganese

Moving the needle

When it comes to the supply of minerals into the battery value chains, there is China and there is the rest of the world. Even for minerals overwhelmingly concentrated in specific countries, like the DRC, home to 70% of the world's mined cobalt, or Indonesia, mining 50% of the world's nickel, China still has the upper hand, refining 73% of cobalt and 68% of global nickel. China also accounts for 59% of lithium refining and 90% of both manganese and graphite refining. Battery-grade refined materials like lithium carbonates, manganese sulfates or graphite anode materials outside of China are a needle in the haystack of Chinese supply.

Very few mining companies can provide a decoupling alternative from a Sino-centric battery supply chain. Some of these are in Africa. In the copper space, Ivanhoe is building Africa's largest smelter, a 500,000 t/y of 99% pure blister-anode copper, coming online by the end of 2024 at the Kamoa-Kakula copper mine in the DRC. In graphite, Australian-listed Syrah Resources offers an alternative to Chinese anode material. Syrah operates the largest integrated mining and processing graphite mine, the Balama mine, in Mozambique. 80% of graphite shipments from Balama have been feeding into the anode industry (mostly to China), but Syrah launched this year an anode material facility in Louisiana, US, becoming the only natural graphite anode material facility integrated with an upstream mine outside of China. In manganese, a resource found across Europe, Africa and the Americas, there are currently only two companies outside of China producing manganese sulfate monohydrate (HP MSM), the material feeding directly into battery space. These are Nippon Denko in Japan and Vibrantz Technologies in Belgium. However, African companies are starting to rise to the challenge, with two African players positioned to provide alternative HP MSM; Giyani Metals in Botswana and Manganese Metal Company (MMC) in South Africa.

Except for MMC, all the African-based companies mentioned above started from the resource before moving downstream. However, we are starting to see a refinery-first model taking off. MMC is the best example. MMC is the only high-grade electrolytic manganese metal (EMM) outside of China and the largest supplier of manganese units for LIB's type precursor cathode active material (PCAM) production outside of China. It processes manganese from South 32's mine as part of a long-term agreement. Now, the company is looking to move a step further and produce HP MSM, building a 6,000 t/y manganese sulfate plant for Western manufacturers.

According to Louis Nel, the CEO of MMC: "A very small portion of manganese ore goes into batteries and there is no need for finding more resources. More than enough manganese is being mined already. I think starting with the ore body is a fundamental mistake."

Another company that is set up as a refiner is Kobaloni Energy, poised to become the first cobalt refinery in Africa. Backed by Vision Blue Resources as a majority equity shareholder, Kobaloni is at the feasibility stage for a 6,000 t/y cobalt metal contained in sulfate, the equivalent of between 800,000 and 1 million batteries/year, depending on the battery chemistry. Once the debt portion of the financing is secured, Kobaloni expects to be in production within 14 months.

The advantages of refining in Africa are obvious, from reducing the environmental impact of transporting ores to China to adding value within the continent and providing an alternative for Western auto manufacturers. But the challenges are commensurate. The biggest one is cost-competitiveness against China, of course. Despite multiple MoUs signed between the DRC, Zambia, the EU and other parties for the establishment of a regional EV value chain and a special economic zone in the Copperbelt region, investments has failed to follow. "We are grateful for the tremendous support from both the Zambian and American governments: we are the first movers in the refining space since the signing of the MoU between the US, Zambia and the DRC to build battery capability in the region more than three years ago, but this begs the question of why don't we see others," said Johnny Velloza, the CEO of Kobaloni Energy.

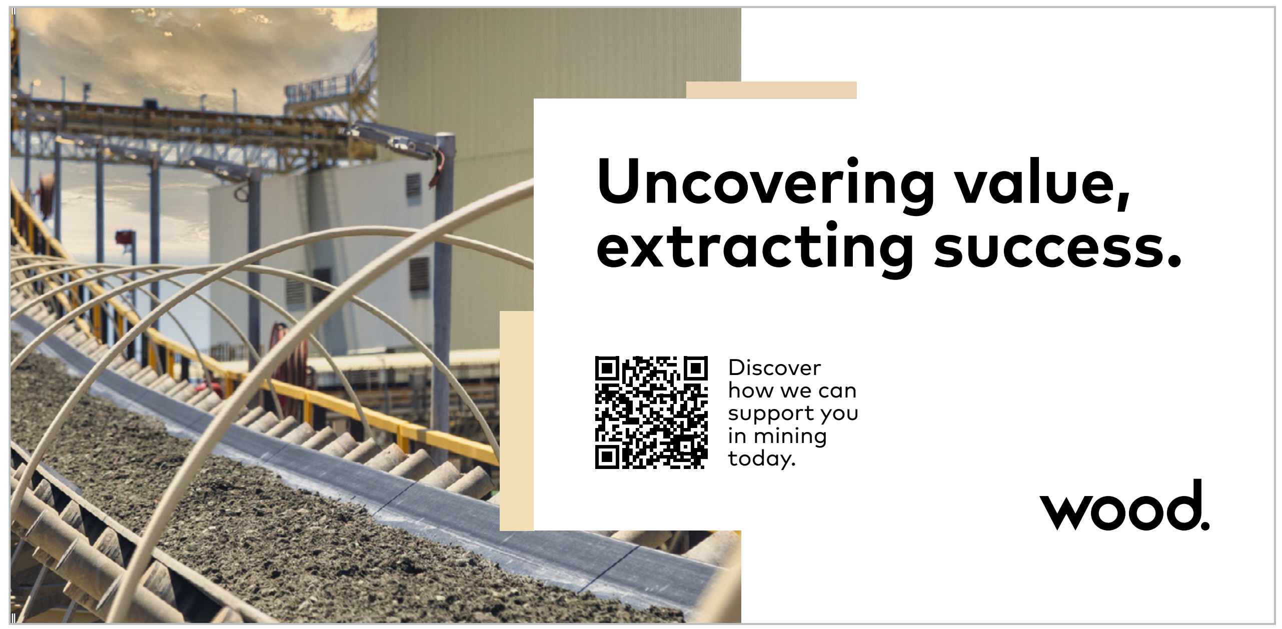
Outside of these examples, most of Africa's mined battery minerals have either landed in the Chinese EV production machine, with most of the Congolese cobalt mines and Zimbabwean lithium mines being owned by the Chinese, or are still in the ground, at an exploration or development phase. Lithium projects are found in the DRC (Tantalex Lithium Resources), Namibia (Lepidico), South Africa (Marula Mining), Mali (Kodal Resources and Ganfeng), Ghana (Atlantic Lithium), Côte d'Ivoire (Firering). Graphite sources are also rather dispersed, with Mozambique taking the center position (Syrah Resources is the largest producer, with EcoGraf and Magnis on the junior side), followed by exploration and development projects in Madagascar (NextSource Materials), Tanzania (Black Rock Mining, Walkabout Resources, and Volt Resources).

Stuck in a supply glut

2024 has been a difficult year for most of the battery mineral players listed above due to tumbling prices. Lithium, which earned the moniker of 'white gold' after lithium carbonate prices appreciated by over 1,000% in just two years between 2020 and 2022, has shed all those gains and more since. Lithium carbonate dropped to CNY 76,000/t in November, down from CNY 597,400/t two years ago. The share prices of explorers also slipped considerably, Lepidico losing 67% of its share price value, while Atlantic Lithium suffered a -41% change (year-to-date). Nickel and graphite have also been trending downwards, though less dramatically compared to lithium. The cobalt market has also been bearish, while for manganese things look less drowsy.

To some extent, this performance can be put down to slower demand for EVs, combined with uncertainties over breakthroughs in pyrometallurgical and hydrometallurgical battery metal recycling, which would significantly reduce the need for primary ore material. PwC predicts that up to 60% of the materials used to make batteries in Europe could come from a recycled source by 2040. In such a scenario, the mining of minerals for battery manufacturing could peak by the mid-2030s, suggested American think-tank RMI.

But the price of most battery minerals today is too soaked in a supply glut to reflect the strong demand case ahead of them. Despite the lower-than-predicted uptake of EVs and the potential implications of a more circular battery supply chain, demand for the entire Li-ion battery supply chain continues to ascend, fast. McKinsey suggests this would expand from 700 GWh in 2022 to 4.7 TWh by 2030 – resulting in the quadrupling of the market value of the sector, from US$85 billion in 2022 to US$400 billion in 2030. The price slump is more a result of over-production than under-consumption. China has been both intentional and predatory in flooding the lithium market so it would drown everyone in it, including its domestic players. In



graphite, the source of the less expensive electron in the battery cell, China produced so much synthetic graphite that it drove the price of synthetic anode material below those of natural graphite, wrote Benchmark Minerals. Typically, synthetic graphite is mixed evenly with natural graphite in the anode, so that the battery benefits from complementary properties; the price of synthetic graphite is usually higher than that of mined graphite.

Meanwhile, for nickel, the pricing power is driven by Indonesia, which is the largest source of nickel ore. China has changed the game there too, developing a highly polluting High-Pressure Acid Leaching (HPAL) technology to process lower-grade laterite nickel ores into battery-grade materials, whereas traditionally it was only nickel sulfide deposits that would be processed. This essentially creates an almost limitless supply of low-cost Indonesian product.

However, these dumping tactics, meant to kill competition, could also be suicidal for China and Indonesia's domestic industries, and therefore cannot be maintained indefinitely. Nickel production in Indonesia is expected to decline from an astounding 24% CAGR growth between 2018 and 2022 to about half that growth between 2023 and 2027, estimates Mining Technology. Chris Showalter, the CEO of Lifezone Metals, the developer of the Kabanga nickel project in Tanzania together with BHP, believes Indonesia is recognizing the self-defeating point to adding new supply that hurts the entire sector: "Indonesia is starting to focus less on market share gains and more on supporting the price to make sure its operations stay profitable going forward."

> *"Major companies are less likely to venture into newer fields like lithium, a sector dominated by juniors. We also see a shift in the profile of investors, with downstream companies directly investing in upstream projects."*
>
> Sifiso Siwela,
> Principal Consultant and Africa Lead,
> **Environmental Resources Management (ERM)**

The same view is shared by players in the lithium and graphite spaces. Trevor Barnard, the CEO of Kuvimba Mining House, operating the Sandawana lithium project in Zimbabwe, thinks lithium prices have gone from unsustainably high to unsustainably low, and that will result in the weed-off of many lithium players who cannot continue in the current market. Shaun Verner, the CEO of Syrah Resources, which operates the 350,000 t/y Balama mine in Mozambique, also believes Chinese synthetic producers are losing money and selling below cost. "The question is how long they can go like this," he said.

Waiting for China and Indonesia to slow down outputs or for the weakest players to die off so that supply is rebalanced is not enough. Battery minerals players are hoping for a split between the Asian price and the Western price, a stratification seen in the oil industry to some extent, with West Texas being priced differently to Mexican basket or Sweet Crude Oil. The emergence of a premium price would be the thing to really move the needle on an ex-China battery value chain.

From demand and supply to geopolitics and ESG

Based on purely commercial fundamentals, there are few countries that can compete with China, which more than fulfills existing demand. A premium price would be justified by a different kind of demand, driven by two factors. One is fears over the security of supply, both at government and corporate level, which would determine a 'source premium'. And the other is sustainability, resulting in a 'green premium.'

To start with, nationalist policies are already creating a market for non-Chinese battery mineral supply. The most famous of them, the IRA, is to prohibit EVs containing critical minerals extracted, processed, or recycled by 'foreign entities of concern' (FEOCs) from qualifying for tax credits of up to US$7,500 from 2025 onwards. Though it is yet unsure how strictly this would be enforced, the measure would theoretically bifurcate the global market in two – those paying the extra costs of IRA and the rest. In the EU, the Critical Raw Materials Act is also targeting import dependencies on any single country. Regulations take an even more serious tone with direct tariffs applied on imports. Starting in 2026, the US is said to introduce a 25% tariff on natural graphite as well as anode material from China.

> *"The Chinese came into the continent earlier, but today, the race between the East and West to secure critical minerals for the energy transition is driving a greater presence of both Europe and the US in Africa."*
>
> Joe von Aulock,
> Industry Manager, Mining, Minerals, and Metals,
> **Endress+Hauser (E+H)**

China is not resting on its laurels, and is introducing restrictions on graphite exports and other critical metals.

Such retaliatory measures escalate anxieties for both politicians and businesses, creating the strongest impetus for a premium price. Besides the West-East throwing restrictions at one another, there is a third nationalistic thrust coming from African countries restricting raw material exports and forcing in-country processing – with unclear impacts so far. For instance, Zimbabwe, the only lithium producer in Africa and a top 10 lithium producer globally, has introduced measures to curb exports of unprocessed lithium concentrates, hoping to see more in-country beneficiation. The same is observed in other African countries rich in critical resources. Chris Showalter, the CEO of Lifezone Metals, a which has an in-house hydrometallurgical processing technology applicable across multiple metals, said: "Every host country with naturally endowed sovereign metal is going to be policy-oriented to maximize the value of its resources in-country."

These geopolitical shifts have already led to a bifurcation of the battery mineral markets. When the IRA was launched, South African manganese metal producer MMC was suddenly inundated with requests from North American customers for manganese sulfate. According to Charles FitzRoy, the CEO of Giyani Metals: "Multiple yet unofficial sources insinuate up to three times higher prices for European manganese at around and above US$2,000/t – and that premium constitutes a major driver for projects outside of China."

The other driver for a price premium is sustainability, by demonstrating a better ESG profile as opposed to standard priced battery product, in compliance with both self-imposed and mandated targets. To make such an argument, the origin of the product, be it Chinese or African, is less important. The difference is made by the extraction and processing technologies as well as the source of energy to produce the battery material. For example, Syrah Resources highlights that China's synthetic graphite has about three times the carbon intensity of its natural graphite-to-anode production from the Balama mine to the Vidalia anode facility.

Indonesia's nickel is also highly problematic from an ESG perspective. Showalter explained: "Indonesian nickel has between 60 to 100 t of CO_2/t of nickel as a result of the highly power-intensive thermal heat treatment steps to get to battery-grade nickel sulfates from low-grade nickel, not to mention the impact of cutting through rainforests and decimating those natural ecosystems. By comparison, by using our Hydromet technology at Kabanga and producing locally without the Scope 1, 2 and 3 emissions associated with transport, we can provide nickel with ultra-low levels of CO_2 emissions. (...) Battery manufacturers and car manufacturers may not want to take Indonesian nickel but they do not have an alternative. However, if you look at Tesla's annual report, about 33% of the CO_2 associated with a Tesla vehicle is attributable to the nickel in the battery cathode."

Companies paying the costs for environmental compliance are justified to ask that their products be priced at a premium, but it is probably bad timing to speak about a premium in the current context of slower EV uptake, strong competition from Chinese EV OEMs, and very low prices on raw materials. The costs of a price premium would be passed on to consumers and there is little evidence to indicate end-users would want to pay that premium for a non-Chinese or greener car. "If governments want to decouple from China, they cannot leave it up to pure commercials because we cannot compete with China on costs; nor can they leave it up to the end-users, for there are few countries where people will pay a premium for a non-Chinese car. Government support is key," said Louis Nel, the CEO of Manganese Metal Company (MMC).

The push must come from regulations or from government incentives. Besides matching China in quid pro quo trade tariffs, governments looking to develop the ex-China battery supply chain should also start matching the Chinese in supporting the industry directly. "Chinese suppliers are heavily supported through government incentives and subsidies, and we are starting to see similar policy support in the US and Europe to counter these Chinese moves. What was once a market based on supply-demand fundamentals is now being significantly influenced by geopolitics," said Shaun Verner, CEO, Syrah Resources.

Development finance institutions have already started playing a bigger role. Lifezone announced this year the start of a finance application process with the US Development Finance Corporation; Giyani also benefited from financing from the Industrial Development Corporation (IDC) of South Africa. Various critical metal projects have seen the support of Japanese parastatal JOGMEC too in recent years (including Be Metals in copper and Namibia Critical Metals in REE). ■

Trevor Barnard

CEO

KUVIMBA MINING HOUSE

Could you introduce Kuvimba Mining House?

Kuvimba Mining House is owned by Zimbabwe's sovereign wealth fund, the Mutapa Investment Fund, which holds all state companies in the country. We run Kuvimba as a private business divided into four clusters: gold, base metals, energy metals and PGMs. A significant number of the mines in our possession were on care and maintenance before Kuvimba came in with the resources to restart these operations. Our model is to develop high-quality projects (that were once in trouble) into world-class assets and create wealth within Zimbabwe.

Could you provide an overview of the four clusters?

Under the gold cluster, we produce around 300 kg/month mainly from three entities: the Freda Rebecca mine (FRGM), the Shamva mine, and the Jena mine. This makes us the largest gold producer in the country. We also have other gold assets under development. The base metals cluster is mostly represented by our chrome mines around the Great Dyke of Zimbabwe. Our energy cluster is represented by the greenfield Sandawana lithium project. To date, we defined a spodumene resource of 40 million t of ore at 1.4 lithium oxide, with the potential to double its size through further exploration.

Finally, our PGM cluster is Great Dyke Investments, one of the largest platinum resources in Zimbabwe. This is a development project, and we are currently doing a funding raise to bring it into production.

Could you give us a sense of the mining environment in Zimbabwe?

Zimbabwe has a mature mining industry with a highly competent and well-qualified workforce. Geologically, the country is also well-endowed with a spectrum of metals and minerals. The economy has been struggling in recent years and we also deal with a poor perception of the country from the outside, but it only takes to come to Zimbabwe and work here for a short while to understand this is a prolific mining environment, with a supportive government and great geological prospects. ■

Johnny Velloza

CEO

KOBALONI ENERGY

Kobaloni is developing the first cobalt sulfate refinery in Africa. Could you introduce the company?

Besides reducing the carbon footprint associated with transportation, we saw an opportunity to add value to the minerals within the continent, something that resonates with both national governments and financial institutions prioritizing local beneficiation. The US and other countries have become more eager to wean off China's dominance over mineral supply and processing. Kobaloni emerges as an alternative to China for Western auto manufacturers, by supplying cobalt sulfate directly from Zambia, in the heart of the Copperbelt, which is the leading source of cobalt in the world.

How advanced are you today in the project and what are the upcoming milestones?

We completed a conceptual study, pre-feasibility studies, and the final feasibility study. These studies allowed us to prove we can produce a battery-grade cobalt sulfate that meets international specifications. At this stage, we have confirmed the capital required for the project and we have completed 60% of detailed engineering on the project. We are now busy securing the debt financing for the build out of the project. Other upcoming milestones would include obtaining the environmental permits.

Are you looking at both Zambia and the DRC for the supply of cobalt hydroxide feeding into the refinery?

Kobaloni will be working with regional producers of cobalt hydroxide who are currently exporting to China. We have already secured an MOU for the supply of cobalt hydroxide with a producer out of the DRC, but our medium-term objective is to secure cobalt out of Zambia.

Could you elaborate on the infrastructure challenges faced in Zambia and whether developments like the Lobito Corridor are an enabler for the refinery?

The reality is that infrastructure in the region must improve. The Lobito Corridor, once fully operational, could be an enabler for us, and it is something we will consider for both inbound and outbound logistics, as long as it is cost competitive. ■

Shaun Verner

CEO

SYRAH RESOURCES

Could you introduce Syrah Resources?

Syrah operates the world's largest integrated natural graphite mining and processing operation, Balama, in Mozambique. With a capacity of 350,000 t/y concentrate and over 100 million t ore reserves averaging around 16% graphitic carbon grade, Balama has a life of mine of 50+ years. Since commencing production at the end of 2017, approximately 80% of shipments have been to the battery anode industry, predominantly to China. The second major part of the business is Vidalia, an active anode material facility in Louisiana. Following a 2021 offtake agreement with Tesla, in 2022 Syrah committed to expand Vidalia into a commercial-scale production facility. Vidalia is the only natural graphite anode material facility integrated with an upstream mine outside of China.

In February 2024, we started producing material at Vidalia, and with that, we initiated the testing and qualification processes to meet the specifications of multiple cell manufacturers. It takes about 12 months to qualify the material, so we hope that by early 2025, we can begin commercial sales. We already have commercial arrangements in place with LG, Samsung, Ford, and SK On, as well as the offtake with Tesla.

What is the current demand for natural graphite for battery manufacturing?

Despite strong demand for lithium-ion batteries from the EV sector, demand for finished natural graphite anode material has been weaker than expected, largely due to competition from synthetic graphite supply in China. However, we are starting to see several ex-China anode material facilities being developed around the world. BTR, a leading anode producer, has started production at its large Indonesian facility, and South Korea's Posco is establishing an upstream processing plant, all in response to China's recent licensing of graphite exports. Syrah is well-positioned to benefit from this shift, with natural graphite sales contracts executed with both Posco and BTR. With growing demand for natural graphite supply outside of China, Balama is in a great position as an established and large supplier. ■

Charles FitzRoy

CEO

GIYANI METALS

Could you introduce Giyani to our readers?

Giyani is a TSXV-listed company developing a battery-grade manganese project in Botswana. On our 2,000 km2 license area in the country, we have four at or near surface manganese oxide deposits. Currently, we are working on a DFS to be released in 2025. The mining license, environmental authorization and surface rights for the mining area are in place. Our demonstration plant to produce high-purity manganese sulfate monohydrate (HPMSM) or more commonly referred to as battery-grade manganese, is expected to make first product by the end of 2024.

Could you elaborate on the demo plant?

Over the past five years, we developed a proprietary process to produce HPMSM, the preferred manganese battery precursor for manganese containing electric EV batteries. The demo plant in Johannesburg is capable of continuous production, allowing us to demonstrate we can deliver a consistent product – key for product qualification, as we will be sending the product to offtakers like big car companies to ultimately secure the offtake agreements that will form a big part of our project financing once the DFS is released.

What makes Giyani a good investment?

First is our location. Botswana is ranked at the top of the Fraser Institute in Africa for a reason. We received both the environmental authorization and the mining license within nine months since submittal, when it takes a lot longer in most other parts of the world. Our ore bodies also make for a very straightforward project. We have at surface, already weathered, low-impurity manganese oxide deposits that can be leached using our proprietary process to obtain battery grade purity material of 99.97% purity. This process is the heart of Giyani. Giyani is perfectly positioned for the ex-China manganese demand. We have the right team and the right product in the right jurisdictions to get our product to the market quickly, and timed to start producing when the manganese demand is forecast to increase significantly, roughly from 2027 onwards. ■

Energy Resources

Uranium and Coal

Baseload, please

Image by Seriti

Uranium and coal make an unlikely pair, with one boasting zero carbon emissions and the other the most carbon-intensive of all fossil fuels. However, they have more in common than one would care to admit: Both are mined materials used in power generation; both go through a legitimization journey, even if one is ascending and the other is not; and both are positioned in a dialectical relationship with renewables. Crucially, the two use the same irrefutable argument of 'baseload' in their justification for relevance in the energy mix: Uranium and coal are the only mined sources of baseload energy - the minimum level of continuous energy supply - something that nuclear plants and coal-fired plants are equally adept at providing.

The purpose of placing uranium and coal in the same category for this article is not to irk our readers, nor to force an association between these commodities, but to highlight a shift in the energy transition debate. The argument put forward by both uranium and coal proponents is that the energy transition has been idealized, renewables over-hyped, and reality ignored. Or, in the words of John Borshoff, managing director and CEO of Deep Yellow, a uranium developer in Africa: "The energy transition is misunderstood and oversimplified because there is no way we can fully switch to renewables in 15 years."

There is another aspect to bringing uranium and coal together on the same page, and that is to show that all energy sources are on the table. For years, the energy transition debate was filled with mudslinging, especially between fossil fuels and renewables. Renewables were hit at their weakest point, intermittency (or the lack of baseload). Hitting back, coal producers were targeted for their heavy emissions, with no less than 15.4 billion t of carbon dioxide in 2023 stemming from coal burning, according to Statista.

"The argument for decarbonization through renewables is running slimmer as people become more educated on the carbon-intensive processes for manufacturing solar panel or wind turbine infrastructure, not to mention the impossibility of recycling this infrastructure and their short lifespan, with most needing to be replaced every 20 years. By contrast, a nuclear power plant lasts for 80 years and provides zero-emission energy. It is becoming well-accepted that nuclear is the obvious route in the energy transition. The richest countries in the world, along with the big banks and big tech companies, are embracing nuclear," said Murray Hill, managing director & CEO of Elevate Uranium, a uranium developer in Namibia.

But the finger-pointing turned more sophisticated, almost philosophical. Coal advocates were accused of putting their own interests ahead of the interests of the world. The fossil fuel camp called out the hypocrisy of shunning coal but buying everything else built at the mercy of coal-burning plants, especially in China, which is the largest consumer of coal and the largest producer of just about anything coming out of a factory. Even the cherished solar panels and wind turbines can be born in a coal-powered manufacturing site. Fossil fuel proponents also ask advocates for renewable to reflect on the issue of privilege before preaching greenness to the vast number of people that live without electricity in the world.

Completely and immediately depriving one country of a critical resource, even if it is a highly polluting resource (the largest source of carbon dioxide), could cause more harm than good. The pros and cons must be measured, and the energy options available should be seen through more than a simplistic dynamic of villain and hero. "As a global population, we should not be arrogantly arguing about who is better than the other. In a country like South Africa, it is not possible to completely get rid of fossil fuels without losing out on energy security and affordability; we need baseload power, and the 16 coal-fired power stations we have will continue to generate beyond 2035. (...) We need a diversified and dynamic energy mix for the days when there is no sun, no wind, or we have a drought season," said Mike Teke, group CEO of Seriti Resources.

Meanwhile, uranium sat on the side, troubled in its own ways, leaving the fossil fuel and renewable sides to fight their battle. Uranium needed time for the world to forget about the destructive properties of nuclear energy and concentrate on its productive ones; a highly efficient productivity with zero emissions. Uranium is not a fossil fuel nor a renewable, but it has exactly what the other two each lack: baseload and zero emissions.

The energy transition is clearly not about what replaces what and when, but about reaching compromises. There are no ideal energy sources with a completely clear conscience or a universal application. Fossil fuels, uranium, renewables, and other sources like geothermal, will have to coexist. They are already co-existing even within the same company. South African coal producer Seriti Resources is building the largest wind farm in the country and has recently acquired a 100% stake in Windlab South Africa through its Seriti Green subsidiary. Coal and renewables are no longer mutually exclusive, and the diversification of coal companies into renewables speaks of their embracing what they have always been at their core - energy companies.

In Africa, there is only one nuclear power plant in use, found in South Africa. However, the continent is an important consumer of coal. In South Africa, coal accounts for 80% of the power supplied to the grid. In terms of supply, Africa is highly relevant for both uranium and coal. While uranium is at home in Namibia, currently the world's third-biggest producer of the radio atomic element, coal is primarily mined in South Africa, the seventh largest producer in the world and fifth biggest exporter.

The reckoning happening in the energy world today is that the colors of the transition may not be all green; black crude oil, greyish coal, and dull silver-grey uranium muddle the energy spectrum. This argument is now being accepted. Indeed, the argument for stability first often overrides carbon considerations.

Spotlight on uranium: The long-term bet of the nuclear fuel cycle

They say good things come to those who wait. Uranium companies have been very patient. "Seven years ago, when I started at Deep Yellow and uranium prices were at US\$17/lb, I said we couldn't progress to production at less than US\$65/lb. People thought I was mad. Geopolitical events from two to three years ago led to a widespread realization that the supply shortage will be exacerbated," said John Borshoff, managing director and CEO of Deep Yellow, an advanced uranium developer in Namibia.

After the disasters of Fukushima and Chornobyl, the uranium mining industry was decimated. Those who remained standing had to go through periods of hibernation to survive the long winter of the nuclear fuel cycle. As a result, the supply side became highly concentrated, with only a few large uranium producers supplying the market, like Kazatomprom in Kazakhstan, Cameco in Canada, and two Chinese-operated mines in Namibia. Kazakhstan, Canada and Namibia are today the top three uranium-producing nations.

At the beginning of 2024, the uranium spot price jumped close to US\$100/lb and has since settled in the US\$70 range, with more upside expected. The wait appears to be over. In March 2024, Paladin Energy restarted the Langer Heinrich Mine uranium mine in Namibia, one of the largest uranium mines in Africa. Paladin acquired

48 >>

Gavin Chamberlain

CEO

BANNERMAN ENERGY

Could you update our readers on the latest at Bannerman Energy?

Since the grant of the Etango mining license in December 2023, we have been advancing several key workstreams for the Etango uranium project. In March 2024, we published the Etango XT/XP Scoping Study, outlining two embedded growth options beyond our initial base-case Etango-8 build. One is to subsequently double production capacity and the other is to nearly double mine life to approach 30 years. In June we released the results of the FEED and Control Budget Estimate processes, which reflected an update and higher accuracy refinement of capital costs in line with today's input prices. We were pleased to see only an 11% increase in expected pre-production capital expenditure compared to the 2022 DFS.

Last year we also successfully completed a two-tranche equity placement of A$85 million which has enabled us to continue with early works programs and key long lead item orders. To date we have completed the site access road and construction water supply contracts and are currently busy with the bulk earthworks, internal roads and construction power contracts.

Could you briefly comment on the mining license application process in Namibia?

We could not be more satisfied with the outcome of our Mining License application. It was a very positive process working with the Namibian government and the Ministry of Mines.

Bannerman Energy won the 2023 Mining Indaba Junior ESG Award. Could you speak about your current social and environmental programs in Namibia?

We are co-sponsors of Mondesa Youth Opportunities (MYO) in partnership with the Rotary Club of Swakopmund. MYO is a non-profit trust offering intensive education intervention for students from underprivileged schools who show ability and promise, with an aim to develop the student's leadership skills, teaching them to be good citizens of the future. We are also in our 13th year of our Early Learner Assistance program, an initiative that supports 300 learners each year by providing them basic school necessities, including a school uniform, shoes and a backpack. ■

Daniel Major

CEO

GOVIEX URANIUM

After having the mining license withdrawn by the Niger government at your most advanced project, GoviEx has re-focused its efforts on its Muntanga uranium project in Zambia. Can you bring us up to date with the change?

GoviEx had been doing everything we could to advance the Madaouela project. As established in our DFS, we needed a baseline uranium price at US$65/lb to bring the project into production, and which was finally reached in October 2023. We had secured LOIs representing US$250 million in financing and started the construction of the main access road, and conducted topographic studies and design works, as well as other site works in view of the construction of the processing plant, but the Government nonetheless decided to withdraw our mining license. We see this decision as unlawful. We have sent notifications of dispute to the Government and initiated an administrative recourse in Niger, seeking an amicable solution. Such an amicable solution has not been reached, and we are looking at our legal options and will update our shareholders accordingly.

Could you provide more details on the Muntanga project and the advancements towards a DFS?

Muntanga is a development project, with the DFS planned to be out by the end of this year. We did significant infill drilling between 2021 and 2023 to upgrade our resources from an inferred category. Today, 75% of the 45 million lb uranium resource is in the measured and indicated category, at a US$70/lb uranium price, based on the MRE put out in 2023. Muntanga is a very simple open-pit, heapleach operation. It benefits from very high recoveries and low acid consumption, as recently established in the recent metallurgical studies conducted. The rock is soft, and only need to crush it down to an inch in size, therefore not requiring milling. The land package on the Muntanga project comprises three licenses, over an area of 1,225.9 km^2. This year, we secured the option to acquire 51% of the Lundazi exploration license, strengthening our foothold in the country. ■

John Borshoff

Managing Director and CEO

DEEP YELLOW

Could you provide an operational update on Deep Yellow's flagship Tumas project in Namibia?

One of our key focuses this year has been to transition more resources from the Indicated and Inferred categories to the more Measured Resource and Proven Reserves categories. The current 67 million lb of Probable Reserves give the projects a 23-year LOM, but this is only part of Tumas's potential. In September, we announced that the Tumas 3 Measured Resource was upgraded to 22.5 million lb, following a 12,727-m RC resource infill drilling program completed in June. With the new combined Measured Resource and Probable Reserve base, we are looking at a 30-year LOM.

Could you help our readers understand the current uranium supply-demand fundamentals?

Geopolitical events have led to a widespread realization that supply shortages will be exacerbated. Also there is growing realisation that renewables have limited ability to produce sufficient energy to meet global electricity demand and achieve the stated zero emission target by 2050. The last 12 months have seen an extraordinary top-down acceptance of nuclear power as part of the energy transition. Sweden is a classic example of a country with a highly ambitious green agenda that realized it couldn't rely entirely on renewables. They replaced their goal of 100% renewable energy by 2050 with a goal of going 100% fossil fuel-free instead, including building 10 nuclear reactors. The only countries yet to take action on nuclear are Germany, Austria, Australia, Spain, and New Zealand.

Meanwhile, the supply side is essentially a broken down sector and requires a complete recalibration. To meet the impending demand for uranium, we need new pounds from greenfield exploration, but there are very few greenfield projects out there. Deep Yellow is one of the few companies with not one but two greenfield projects on the conveyor belt to development. ■

Murray Hill

Managing Director & CEO

ELEVATE URANIUM

Could you walk us through the latest developments at the Koppies uranium project in Namibia?

This October, we announced the resource update to 66.1 million pounds U3O8, of which 44 million lb is in the JORC Indicated category. With 78% of our resource in the Indicated category, we have made a major step in de-risking the project. The next step is applying our patented U-pgrade™ beneficiation process. Our total Namibian resource from our multiple deposits amounts to 112.1 million lb U3O8 and our global resource (inclusive of our Australian assets) increased to 160.5 million lb U3O8.

Could you remind our readers of Elevate Uranium's current land positioning and exploration tenure in Namibia?

We have the largest land position for nuclear fuels in Namibia, at around 2,500 km2. In four years, we have made four discoveries: Koppies and Hirabeb, at resource stage, and Namib IV and Capri, where we are actively drilling and expect to report maiden resources next year. In the last financial year alone, we completed close to 100,000 m of drilling across our properties. Namibia offers favorable conditions for inexpensive cost effective, shallow drilling.

When do you think we will see a rise in the valuations of uranium-listed companies?

The uranium spot price is currently sitting at around US$80/lb. Though this is four times higher compared to when we first started building our land position in Namibia, the price needs to surge higher for more investors to jump in. Once the utilities start trying to buy uranium and find out not enough is available, the uranium price will catapult beyond US$150/lb.

Do you have a final message?

Elevate Uranium has a unique ore beneficiation process that adds significant value to our assets; a project to apply this patented process; a de-risked resource base at Koppies; and the funding to get us going, without the need to raise money in 2025. If anyone is looking to jump in and invest in our story, now is the time. ■

<< 45

the mine in 2002, and brought it into production in 2008; but ten years into production, the mine was placed under care and maintenance (in 2018). That same year, another Namibian cornerstone mine, Rössing, also known as the 'old lady' for being one the oldest in the world, was acquired by China National Nuclear Corporation (CNNC) from Rio Tinto. Namibia's third core mine, Husab, holding one of the largest uranium resources in the world, is also majority-owned by a Chinese company, Taurus Mineral Limited, whose parent company is China General Nuclear Power Group.

Along with the three active mines, the scorching Namib desert promises a strong pipeline of new uranium projects entering production in the coming years. After a marathon pace in the last decade, these players have recently broken into a sprint. Deep Yellow is advancing the Tumas, 67 million lb (probable reserves) project, having raised A$250 million in 2024, and is preparing to complete the plant by 2026. Its peer on the ASX, Bannerman Energy, is moving towards a final investment decision at its flagship Etango project, already permitted; in 2024, Bannerman closed A$85 million in financing and released a scoping study, preparing to start production in 2027. Elevate Uranium also leveraged the positive market sentiment in uranium in 2024, raising A$25 million for its Koppies project. Elevate announced a resource update to 66.1 million lb, of which 44 million lb is indicated. The company boasts the largest land position for nuclear fuels in Namibia, with 2,500 km2 under its belt, as well as a patented ore beneficiation technology, which it plans to prove to reduce CapEx and OpEx by 50% versus traditional routes.

Breaking this pattern of Australian-listed, Namibian-operating uranium companies is GoviEx Uranium, a Canadian company that brings the uranium story to Zambia, a country known primarily for copper. GoviEx is the only uranium actor in the country, but CEO Daniel Major says the geology is actually connected to Namibia and other known uranium spots: "The Karoo Sands Basin, which Muntanga and our recently acquired Lundazi license sits on, stretches from Tanzania, through Malawi, and Zambia, touching into Mozambique and Botswana, and going into Namibia, with a small section also crossing South Africa. These are sandstone-hosted uranium structures well-known in countries like Namibia or Malawi but underexplored in Zambia."

Other uranium players in Africa include Canada-listed Madison Metals, operating in Namibia and recently closing an earn-in with Star Minerals; Lotus Resources, which just announced the funding to restart the Kayelekera uranium mine in Malawi; and Global Atomic, which updated the markets in October 2024 on discussions for closing a US$295 million financing for its Dasa project in Niger, believed to be the highest-grade uranium deposit in Africa. Dasa's peer project in Niger is Madaouela, which was developed by GoviEx Uranium before its license was unexpectedly withdrawn by the government of Niger, a decision the Canadian company condemns as unlawful. "We have sent notifications of dispute to the Government and initiated an administrative recourse in Niger, seeking an amicable solution and the reinstatement of GoviEx in its rights to the project. Such an amicable solution has not been reached, and we are looking at our legal options and will update our shareholders accordingly," Major told GBR.

Until a solution is found, GoviEx has fully repositioned to Muntanga in Zambia. Though this was the smaller and less-advanced project in GoviEx's portfolio, Muntanga has a 45 million lb resource (with 75% in the measured and indicated category), and it offers a simple and competitive operation, with soft rock that does not require milling, and 80% of the ore found in two main deposits. GoviEx secured the option to acquire a third license, consolidating its presence in Zambia to 1,226 km^2.

GoviEx needed a baseline uranium price above US$65/lb to be able to bring Madaouela into production, but the Niger government had little patience. A spot of US$65/lb is the usual reference most developers quote for viable projects. The spot market is tight and tense, with every small change causing volatility, which makes it an unreliable indicator of the bigger picture for uranium. Meanwhile, the contract market, which is the larger share of uranium trade, is opaque, with portions of the contracts escalated, and floor-and-ceiling prices established for longer-term deals. The general trend has been for buyers to switch more to contracts in a bid to secure long-term supply.

"Though prices seen today are healthy, the general consensus is that the spot price is bound to spike once utilities have a face-off with the supply deficit, which they currently seem to underestimate. Once the utilities start trying to buy uranium and find out that not enough is available, the uranium price will catapult through US$100 and beyond US$150/lb. That will drive utilities into a FOMO (fear of missing out) mode, scrambling over each other to buy nuclear fuel (uranium)," said Murray Hill, managing director & CEO of Elevate Uranium.

The demand side is stronger than ever. The International Atomic Energy Agency (IAEA) predicts demand for uranium to exceed 100,000 t/y by 2040, which is double current production. New reactors are planned and old ones are being brought back to life all over the world, including in traditionally anti-nuclear countries. "Sweden is a classic example of a country with a highly ambitious green agenda that realized it could not rely entirely on renewables. They replaced their goal of 100% renewable energy by 2050 with a goal of going 100% fossil fuel-free instead, including building 10 nuclear reactors. This is symptomatic of what is happening elsewhere, including in Korea, Japan, India, the Middle East and China. The only countries yet to take action on nuclear are Germany, Austria, Australia, Spain and New Zealand," commented John Borshoff, managing director and CEO of Deep Yellow.

Small nuclear reactors (SMRs) are also coming into the picture, as tech companies like Microsoft and Amazon invest in off-grid nuclear capacity to power ever-hungrier data centers to accommodate AI. "Doing a search on an AI platform like ChatGPT takes 10 times more energy than doing that same search on Google... We are short of 20 to 30 brand-new, state-of-the-art, big reactors just to meet the potential demand of AI, without even considering other incremental sources of energy demand like EVs," said Daniel Major, CEO at GoviEx Uranium.

Meanwhile, the supply side is believed to be broken in more than one way, explained Borshoff, highlighting the exodus of expertise following the nuclear disasters at Chornobyl and Fukushima. Current mines are simply feeding into existing demand, and every time there is a supply shortage or fear of a shortage, the market trembles. Sanctions on Russia or by Russia, as we have seen recently with Moscow restricting enriched uranium exports to the US in retaliation for a similar measure imposed by the US, production shortages at Kazatomprom or Cameco, or Orano losing control over its uranium assets in military-governed Niger, further destabilize supply, leaving the uranium market in a fragile position.

However, investors remain cautious given the uncertainty in the world. Project developers still need to be a little bit more patient while the tide rises, but for now, they have confidence in the mainstream acceptance of nuclear power, which has changed everything.

Spotlight on coal: Stagnant means stable

In 2023, coal production (and consumption) reached an all-time high, according to the IEA. But outside of this isolated event, coal has been very consistent for the past 10 years. In fact, the world produces about the same amount of coal today as it did in 2014 – close to 9 billion t/y. According to Carbon Brief, global coal use is only 3% higher than 2013 levels, whereas coal use used to grow by 4% year-on-year during the 2000s. The capacity of coal-fired plants increased by about 30 GW in the last decade. Meanwhile, total CO2 emissions hit a new record in 2024 according to the Global Carbon Project.

Thermal coal prices are expected to decline in both 2024 and 2025, essentially returning to the values prior to the 2022-2023 peak when the world had to grapple with the shock of losing Russian gas. This price consistency is proof of coal's resilience. When some countries let go of coal, consumption increased in others. When supply is curtailed from a particular country, another comes to the rescue, like we have seen with the China-Australia dispute, with China substituting the Australian imported coal with alternatives from Indonesia, Mongolia, Russia and South Africa. Unlike gas, which is tied to extensive and expensive pipelines, coal is shipped globally, unbound by location. And when majors like Anglo American, Rio Tinto, or Glencore began exiting coal, new companies were born.

48 >>

Anglo's divestment from coal in South Africa resulted in the birth of Seriti Resources, now one of the largest suppliers to the country's utility company (Eskom). Seriti has continued growing by absorbing new coal assets from other larger companies looking to shed their coal businesses, acquiring South32's coal business in 2021. South Africa's coal companies are also making acquisitions abroad, particularly in Australia. Last year, Thungela bought a majority stake in the Ensham coal mine in Queensland, Australia. Whether entering or exiting coal, these transactions are not pennies on the dollar. Thungela's acquisition of Ensham is believed to amount to over US$200 million.

Another mark of coal's resilience is the ability of coal companies to transform by incorporating green businesses into their portfolios. For instance, South32 was created a decade ago as a spin-off from BHP Billiton; the company had thermal and metallurgical coal as base assets but has grown to develop a more diversified asset base. Coal companies are either investing in renewables, or in base and critical minerals like manganese, nickel or copper, essentially positioning to stay relevant in the future. This year Menar, a South African coal producer, bought the Metalloys ferromanganese smelting complex from Samancor. Upon completion of the transaction, the complex will be rebranded to Khwelamet. Besides coal and the manganese smelting business, Menar has a gold project in Kyrgyzstan and a nickel-cobalt asset in Turkey.

We started this article by saying that multiple coal metrics show flat lines. Between those lines, we can read that coal is stable, not drastically down, and certainly not out. ■

"We should start worrying more about the energy mix and stop wasting time on futile debates on whether we need to destroy fossil fuels for the sake of green energy or vice-versa – this has led to more 'persuasion fatigue' than any tangible outcomes."

Mike Teke, Group CEO, **Seriti Resources**

Vuslat Bayoglu

Managing Director
MENAR

"Our vision is to target US and European steelmakers, turning the asset into a critical step towards South Africa's re-industrialization and wealth generation."

What have been the latest developments at Menar's assets over the past year?

We had some major developments at the Gugulethu project, which we initiated in 2021. We brought this mine into production in early 2024, commissioning a 400 ton-per-hour coal processing plant. Our target is to achieve a production level of 200,000 tons per month. Gugulethu is the latest coal mine developed in South Africa, and it will create around 400 jobs.

Additionally, our East Manganese project, which commenced in 2021, is operational, producing 30,000 t/month. During 2024 we completed our first shipment, a 55,000 t cargo out of Port Elizabeth. East Manganese is a small operation, but it has provided valuable experience in manganese production, subsequently leading to our acquisition of Samancor's Metalloys. The project boasts manganese content of 36% to 37%, which can be beneficiated to 80%. This is currently exported to China (mostly) and India for ferromanganese production. Also in the manganese space, we have the Kongoni project, a JV with ERG Africa. Kongoni has a similar manganese content of 36 to 37%, and we are waiting for market conditions to improve before we bring this into production.

Lastly, we began rehabilitation work at the Phalanndwa thermal coal mine, where reserves have depleted. We hope to complete the rehabilitation in the next 18-24 months and then apply for a closure certificate.

Could you comment on the recent acquisition of Metalloys ferromanganese smelting complex from Samancor?

Before its closure Metalloys produced 500,000 tons of Ferromanganese annually. It had two operational furnaces, each with the capacity to produce 250,000 tons per annum. In 2020, the outdated furnaces were put on care and maintenance due to issues with the availability and price of power. We have obtained all approvals from the Competition Commission and are in the process of finalizing the environmental licenses. With Assmang having decided to close its operation in Cato Ridge, KwaZulu Natal there will be no ferromanganese production capacity left in South Africa. So Reviving Metalloys will be great for the country to ensure that we still have the capacity to participate in this crucial sector. We want to contribute to the reindustrialization of South Africa, and, crucially, produce a high- and medium-carbon ferromanganese alloy by minimizing the power used: We can do this either by adding one or two new blast furnaces or by revamping the existing ones using new technology (palletization) to reduce the power requirement. We have a coal mining project situated right next to the smelter complex and intend to use it as a base to explore multiple options for cleaner energy to power the furnaces, including solar panels and also a waste-to-energy project. South Africa currently sells manganese to China, which makes ferromanganese to use in the steel industry. We will be rebranding the complex from Metalloys to Khwelamet. Our vision is to target US and European steelmakers, turning the asset into a critical step towards South Africa's re-industrialization and wealth generation.

How has the discourse around the acceptance of (thermal) coal in the energy mix evolved?

Despite massive anti-coal global sentiment, demand for thermal coal remains very strong, exceeding 8 billion tons in 2024, with China continuing to be the leading consumer. The IEA expects demand for thermal coal to remain strong in 2025 driven by electricity demand in emerging economies like India, China, and Indonesia, even as coal demand in Europe, the US, South Korea, or Japan is declining. Countries that are turning away from coal are bumping into a lot of difficulties: Germany is sitting with 150,000 MW renewable capacity that cannot be deployed, and they don't have a reliable baseload.

An ironic reality check is to think that China's manufacturing industries are powered by coal, yet this does not stop the world from buying products made in China. As of 2024 there were 1142 coal-fired stations in China, 282 in India, and 210 in the US, all three major economies using electricity from coal to make everyday appliances, consumer electronics, plastics, textiles, furniture, and so on, exported globally. That means demand for coal is still very relevant.

While we shouldn't burn coal indiscriminately, we can continue using it responsibly if we invest in technologies like carbon capture, sequestration, and storage to manage emissions effectively. Advances in battery technology may eventually render coal and gas obsolete, but until then, maintaining global energy stability is crucial.

There is no one-size-fits-all solution for all countries. In countries like South Africa, Indonesia, China, and India, coal is crucial for economic competitiveness, as switching to alternative energy sources would significantly increase costs.

Could you walk us through Menar's next steps?

One of our top priorities is to diversify our risk, which is why our Metalloys deal with Samancor is so significant. The commodities market is volatile; it is crucial that we strategically allocate our investments across a diversified portfolio.

Menar is exploring opportunities beyond our traditional focus areas. We are drilling a gold project in Kyrgyzstan, developing a nickel-cobalt asset in Turkey, and continuing with our thermal coal, anthracite, and manganese operations in South Africa. ■

Year in Review – Commodity Performance

Precious Metals

Gold

Silver

Platinum

Palladium

Base Metals

Copper

Nickel

Zinc

Iron Ore

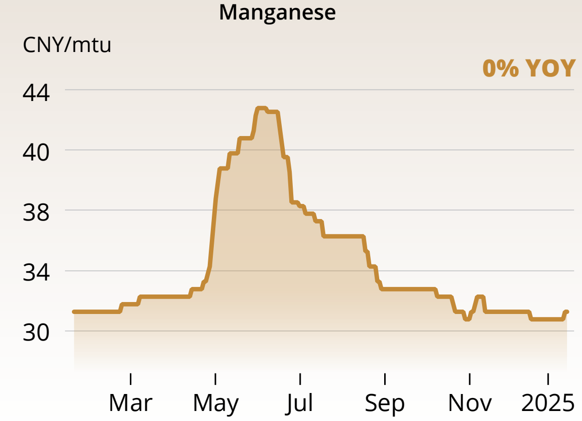
Others

Lithium carbonate

Uranium

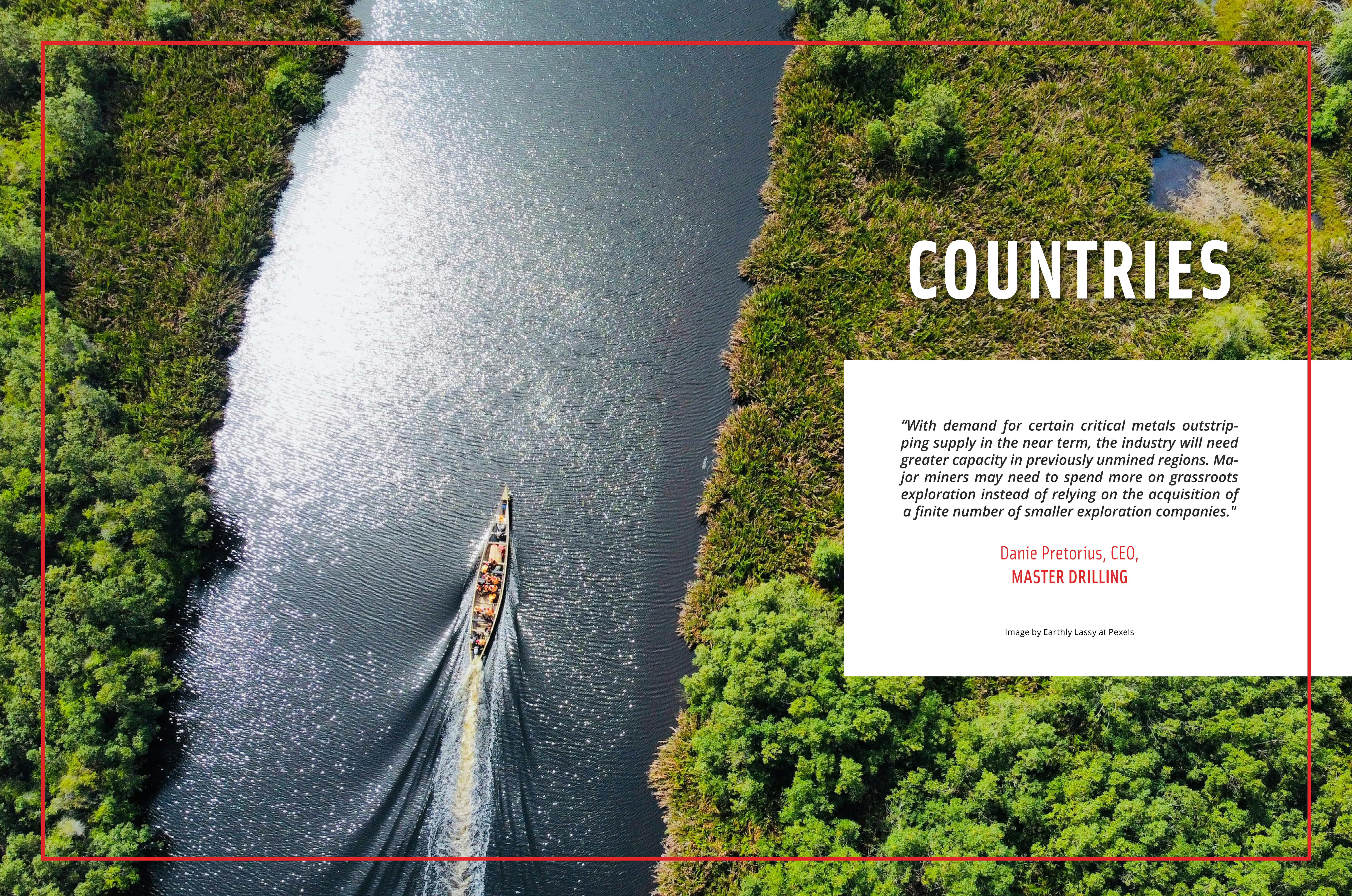
Coal

Manganese



Source: Trading Economics, Based on data from January, 13, 2025

YOY= year over year



COUNTRIES

"With demand for certain critical metals outstripping supply in the near term, the industry will need greater capacity in previously unmined regions. Major miners may need to spend more on grassroots exploration instead of relying on the acquisition of a finite number of smaller exploration companies."

Danie Pretorius, CEO,
MASTER DRILLING

Image by Earthly Lassy at Pexels

Southern Africa

Spotlight on South Africa

Turning the page on history

South Africa is believed to be the world's wealthiest mining jurisdiction, with minerals worth upwards of US$2.4 trillion, according to the World Bank. It boasts many impressive statistics: home to the largest known gold reserves, as well as being the world's top producer of PGMs by a large share. As Africa's biggest economy and most industrialized nation, hosting the continent's largest stock exchange (the Johannesburg Stock Exchange (JSE)), with a sophisticated mining ecosystem led by majors like Gold Fields and AngloGold, South Africa should fit in the league of leading mining jurisdictions besides the likes of Canada or Australia. Nevertheless, South Africa comes behind many of its African peers like Ghana, Tanzania, Côte d'Ivoire, Namibia, Botswana and DRC in the latest Fraser Institute Annual Survey of Mining Companies (2023).

This result is puzzling considering that South Africa compares favorably to other countries in the continent in terms of ease of doing business, ranking in the top five in Sub-Saharan Africa. Though these surveys and indices are surely not all-telling, they do point to the unpalatableness of South Africa in the eyes of foreign investors, despite the country's otherwise superior qualities. Hulme Scholes, director of Malan Scholes Attorneys, a law firm based in South Africa, provideed a snap explanation why that is: "You can mine in a war zone as you see in DRC or in Mali, and you can mine in a near-perfect system as you see in Australia, but what you cannot deal with as an investor, is a half-system, which is where South Africa is at."

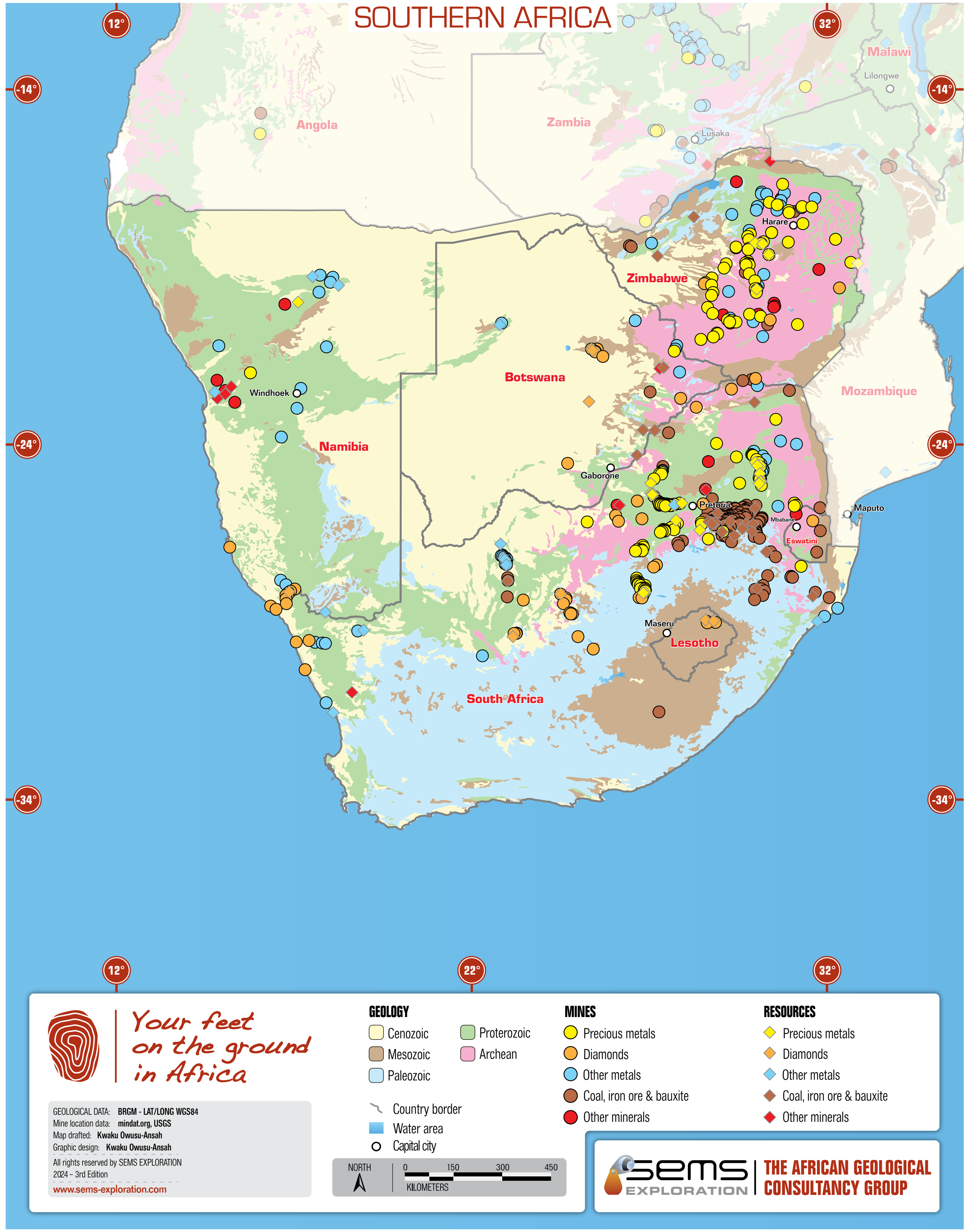
What Scholes means by a 'half-system' is: "One of the best banking systems, amazing infrastructure, highly qualified people and a wonderful geological endowment on one side, and corruption and administrative incompetence on the other."

To understand South Africa's positioning today, we must take a look at its mining past and how this continues to inscribe itself into its present. The discovery of the first diamond on the banks of Orange River in 1867, as well as the following Witwatersrand Gold Rush of 1886, sparked the beginning of a 'Mineral Revolution,' turning South Africa into one of the world's top mining countries. A century after the start of industrial mining, the industry's contribution to GDP peaked at 21% in 1980. But these were not years of glory, despite the industry's momentous performance. Mining was part of the systematic racial segregation whereby the wealth of Europeans grew excessively, while black mineworkers were exploited for minimum pay, at a fraction of their white peers' wages, a structure institutionalized under the apartheid regime.

2024 marked 30 years since the end of apartheid in South Africa, but the policies introduced in 1994 continue to play a part today. Following the regime change, South Africa's mineral policy has been in a contentious stride to undo the wrongs of the past while still supporting the industry, which has been an important part of the country's post-apartheid industrial growth. South Africa introduced Broad-Based Black Economic Empowerment (B-BBEE) policies to ensure the incorporation of Historically Disadvantaged Persons (HDPs) into the mining and minerals industry. The minimum threshold for black ownership of mining companies has been increased from 26% to 30% in the latest mining charter.

The 30% BEE ownership requirement remains highly contentious today and is believed to be a major deterrent to investment. Because of this requirement, an investment of the magnitude that First Quantum made in Zambia, worth US$1.5 billion, would translate into US$500 million going into a BEE company if it was made in South Africa. That is difficult to fathom, according to Scholes: "I see the BEE requirement as an arranged marriage, where you cannot choose your partner. No CEO of a large mining company would want that."

"When the law changed in South Africa with the Mineral and Petroleum Resources Development Act 28 of 2002 (which came into effect on 1 May 2004), South Africa was a hive of M&A and investment activity (...) Everybody had bought into South Africa and wanted to be a part of the Mandela dream. (...) That changed drastically and South Africa started to be seen as another failed African democracy. South Africa dropped right down in the eyes of in-



vestors. Today, we have moved from that frenetic investment hype to a place where we are doing a lot of litigation against the state on issues like overlapping rights being granted or administrative appeals based on maladministration and corruption," continued Scholes.

Though South Africa has a well-developed regulatory environment with clearly defined laws in place, the implementation does not always follow the script. One of the areas where this is most obvious is in the lenghty processes to obtain permits. According to Ntsiki Adonisi, executive head of the natural resources and environment department at law firm ENS, the process of obtaining permits and approvals for things like water licenses or environmental authorizations should not exceed 300 days, but current backlogs make for longer waits. Andries Van Heerden, the CEO of Afrimat, a large construction and mining company with 63 active mining rights in the country, said the company has been waiting for 17 months (at the time of our interview) on an Environmental Impact Assessment (EIA) approval. This process is supposed to last no longer than 12 months.

According to Van Heerden, a more supportive approach from the Department of Mineral Resources (DMRE) could go a long way to accelerate growth in the industry. South Africa's regulators have taken their role of policing the industry seriously, clearly as an answer to bad practices from the past, and the introduction of obligations for community participation and proper rehabilitation have assured that the industry today is far from where it was 30 years ago.

While the mining industry has been fighting its lingering bad reputation, South Africa has also struggled to shake off the perception of corruption. However, the new government is slowly giving a new face to the country, and South Africa seems to be becoming an interesting place for investment once again.

Season of the GNU

Ever since 1994, when the African National Congress (ANC) came to power, the party has won every election by a landslide, taking 62.5% of the vote in 1994 and 66.36% in 1999. For the first time in 30 years, the ANC only garnered 40.18% of the vote in the recent 2024 election, being forced to form a coalition government with the opposition parties, primarily the Democratic Alliance (DA), which came second with 21.81% of the vote. The ANC also lost its majority in mining-focused provinces, including Northern Cape, Gauteng and KwaZulu-Natal, as well as in Pretoria, the country's administrative capital.

The new government is known as the Government of National Unity, or the GNU in short.

"I like to think of GNU as the Blue Gnu Wildebeest, an animal living in Southern Africa that is known to have five subspecies – so is our GNU a mix of multiple parties coming together in the nation's interest. Since the elections, the Rand has strengthened, government bond yields have fallen, the JSE is up by 12%, and significant reforms are finally being made. South Africa is becoming easier to sell at the moment compared to a few years ago," said Roger Baxter, executive chairman of Southern Palladium and former CEO of the Mineral Council of South Africa.

The business community has welcomed the coalition government, hoping it can provide balance, though challenges may arise over sensitive topics, including black ownership rights, which some see as a failed policy.

The issues at the core of deciding the election outcome are pertinent to the mining industry. Unemployment, which is one of the highest in the world at 32.9%, and 45.5% for youth (15-34 years old), has been called a "ticking time bomb" by the UN and was one of the main issues that weakened the ANC. Economic stagnation, perceived corruption and distressed infrastructure were other aspects South Africans were angry about. Currently, 24.5 million people (39% of the population) are on some sort of financial support from the government, which puts great pressure on the country's debt.

South African miners principle concerns are over an unreliable power supply due to frequent load curtailment (or load shedding as it is known in South Africa) from the state-owned utility Eskom, issues related to the country's rail infrastructure managed by Transnet, onerous BBBEEE requirements, and the haunting risks of government interference and nationalization. Improvements have been noted this year on all of these fronts. Eskom reported over nine months without load-shedding – a success of its new Generation Recovery Plan started in 2023. This is a huge change compared to last year when the country saw record blackouts. Eskom has also reported a consistent energy availability factor (EAF) at 70%. However, its request to the electricity regulator for a 36% electricity tariff hike has faced strong opposition. On its side, Eskom says cost savings will not be enough to keep its operations sustainable and that it needs to come closer to cost reflectivity.

The South African energy sector is changing rapidly. Recently, South Africa received US$1 billion from the World

62 >>

Mzila Mthenjane

CEO

MINERALS COUNCIL SOUTH AFRICA

"To reclaim our relevance, exploration activities must increase significantly. Our goal should be to account for at least 5% of global exploration budgets once again."

How does the mining industry align with the Government of National Unity's (GNU) economic growth plan?

At the heart of the GNU's agenda is Operation Vulindlela, a series of economic reforms and green industrialization initiatives designed to open up the economy and help achieve the targeted 3.3% GDP growth by 2025. In my view, the journey toward achieving that 3.3% growth is as important as the goal itself. It lays the foundation for sustainable economic development in the years ahead and reinforces the mining industry's role as a pillar of the country's economic progress.

The successful delivery of Operation Vulindlela 1.0 and the acceleration toward Vulindlela 2.0, alongside the ongoing turnaround at Eskom and performance improvements at Transnet, are all promising signs.

What is the Council's stance on Eskom's proposed cost-reflective tariffs and Transnet's debt burden?

The proposed Eskom tariffs will significantly impact the cost-efficiency (and thus the competitiveness) of the mining sector, which is our biggest strategic concern. Higher energy costs will push the industry to explore ways to cut expenses, including technological innovations, improved labor productivity, and carbon efficiency.

This challenge extends to logistics and Transnet. When discussing cost-reflective tariffs, we must ask: What are the underlying costs these tariffs aim to reflect? Are they a result of debt carried on Transnet's balance sheet or the consequence of Eskom's unpaid bills by municipalities? This raises a critical question: Who should bear that financial burden?

Transnet, for example, faces a substantial debt load. Limited by these financial constraints, it cannot invest adequately in infrastructure upgrades. However, without improving infrastructure, it will struggle to generate the cash flow necessary to reduce its debt. It's a tough situation to break out of.

How do you explain South Africa's high unemployment rate alongside a talent shortage?

The lack of economic growth is partly responsible for South Africa's high unemployment rate: Without economic expansion, the labor market cannot absorb more people. Another critical factor is the skills mismatch. The most dynamic sectors in South Africa's economy, such as financial services, IT, and innovation, demand skill sets that are often unavailable in the labor market.

Additionally, the education system has not adequately equipped young people with essential literacy and numeracy skills, which are fundamental for building the capabilities required by today's job market, let alone tomorrow's. The mining sector currently employs approximately 480,000 people, but the structural gaps in education need to be addressed to ensure broader employment opportunities.

How do you see South Africa's commodity basket evolving to maintain its relevance as a leading mining jurisdiction?

One of the key elements for remaining relevant in a low-carbon future is to leverage renewable energy sources, including green hydrogen, by tapping into the country's abundant solar and wind resources. With an increasing and predominantly clean energy mix, combined with our strong position in the mining of iron ore, manganese and chrome, South Africa has the potential to participate meaningfully in green steel production, in alignment with emerging global regulatory frameworks related to carbon.

In addition, further exploration for battery metals is critical to gaining a better understanding of the country's geological potential. To reclaim our relevance, exploration activities must increase significantly. Our goal should be to account for at least 5% of global exploration budgets once again.

What are the Minerals Council's main priorities going forward?

Our top priority is ensuring that our members achieve their growth ambitions. Although recent improvements at Eskom and Transnet Freight Rail (TFR) are positive developments, they may not immediately translate into expansion projects, as many of our members have already made capital investments but were forced to cut back operations due to constraints from these institutions. Re-employment of workers, following recent retrenchments, would be a strong signal of expansion and recovery.

Creating new employment opportunities would be the clearest indication that we are moving toward the 3.3% growth target. Another crucial sign of progress is an increase in exploration spending. As the economy grows, so will the demand for capital, which will likely drive more junior mining companies to list on the Johannesburg Stock Exchange (JSE).

It is important to recognize that economic growth is not an entitlement. It must be earned. We need to carefully consider the conditions we put in place to attract investment, balancing what benefits the government, the country, and private sector investment. ■

Michelle Phillips

CEO

TRANSNET SOC

> *To restore its reputation as a reliable logistics partner Transnet is implementing a number of strategic initiatives, as part of the Recovery Plan.*

Could you familiarize our readers with the goals and mechanisms of Transnet's Recovery Plan?

In October 2023, Transnet launched the Transnet Recovery Plan in order to stabilize the organization's operational and financial performance. The operational underperformance has led to a decline in volumes, with the most significant decline being in the rail operations division.

Contributing factors to the decline in performance include historical underinvestment in maintenance, an increase in theft and vandalism, lapses in governance, unavailability of rolling stock and operational inefficiency.

To restore its reputation as a reliable logistics partner Transnet is implementing a number of strategic initiatives, as part of the Recovery Plan and in alignment and with the direct support of the National Logistics Crisis Committee (NLCC), to optimise the business to drive efficiencies.

Transnet has adopted a two-pronged approach, with the first element focused on the improvement and optimization of the business through a deep focus on the recovery of volumes from key operations and improved customer responsiveness. This includes structured approaches to operational reform, more targeted investment in infrastructure and equipment, improved equipment maintenance and enhanced availability of locomotives, wagons and port equipment. The second element focuses on the structural changes and reforms necessary to meet the requirements for sustainable growth in the future and compete in an evolving logistics sector.

The main drivers of the transformation in the transport and logistics environment include the National Rail Policy (2022), and the Roadmap for the Freight Logistics System (2024) in South Africa.

What milestones have been reached to date in the recovery plan and what are you prioritizing next?

One of the significant milestones achieved has been the implementation of a locomotive restoration programme by contracting with OEMs. It is envisaged that this programme will enhance rolling stock availability through addressing the issue of long-standing and underutilized assets. Additionally, steps taken to streamline costs and improve revenue collection have led to a more stable financial outlook.

What are the advantages of the separation between Transnet Freight Rail and Transnet National Ports Authority?

The changes will culminate in a highly efficient, reliable and sustainable freight logistics system characterised by enhanced capacity and efficiency due to private sector participation, investments in infrastructure expansion and upgrades, and improved reliability.

Could you comment on the plan to open the rail network to private participation?

The process to open the rail sector to private partners is still underway. Minister of Transport, Ms Barbara Creecy has announced that the final Network Statement will be published by the end of 2024.

Do you have a final message for our readers?

Although challenges abound, the Recovery Plan is bearing fruit. In the year ended 31 March 2024, we saw a marginal increase in rail volumes as a result of the Recovery Plan initiatives, ending the year at 151,7 million t, compared to 149,5 million t in the previous reporting period. This marks an effective arrest of a six year decline in volumes moved and a stabilization of the business.

For the 23/24 financial year the rail target is considerably higher at 170 million t. September YTD performance for total rail volumes shows an improvement across all corridors compared to the same period last year. The total volumes railed for the YTD period were 78.34 million t against a corresponding YTD recovery target of 82,35 million t. This translates to approximately 4.02 million t (4,9%) volume shortfall against the target. However, a significant improvement in weekly rail volumes was realized in the eight weeks leading to the end of September with an average weekly performance of 3.3 million t, which is above the weekly average budgeted tempo of 3.27 million t. Rail performance continues to be primarily affected by high security incidents, train derailments and locomotives issues that lead to operational disruptions and delays.

Our stakeholders, including customers and the National Logistics Crisis Committee (NLCC), have been instrumental in the headway we are making in implementing the Recovery Plan. This collaboration ensured that the planned tactical initiatives of the Recovery Plan are implemented with speed and agility. For example, Transnet Port Terminals (TPT) has entered into long-term contracts with OEMs for the supply of new equipment, the provision of spares and technical support.

Transnet is committed to continuing to build trust with our stakeholders through openness, honesty, integrity, and consistent communication. ■

Dan Marokane

Group Chief Executive

ESKOM

> *With our operational turnaround well underway, Eskom is on the path to profitability and transitioning responsibly into a competitive marketplace.*

Eskom has managed to deliver a constant power supply and suspend loadshedding for more than nine months. How did Eskom reach this point and what will it take for this performance be maintained?

Loadshedding has been suspended for over nine months and unplanned outages at our coal fired power stations are at four-year low due to the successful implementation of the Generation Recovery Plan that started in March 2023. This has delivered significant cost savings and enhanced the reliability of the coal-fired fleet, ensuring a stable and reliable power supply for all South Africans. Investors are noticing these results.

Eskom's Energy Availability Factor (EAF) has been on an upward trend, and we have seen our top-performing stations consistently achieving an average EAF of 70% and above. The focus remains on ensuring that the other power stations sustain EAFs above at least 60% in the interim, and gradually improving this as the efforts to reduce the unplanned outages continue.

These results are from the concerted effort and dedication of Eskom's 40,000 employees who have been crucial in driving these positive outcomes, and whose contributions are clearly reflected in the results today.

How will you balance the need to ensure continued supply from a base of coal-fired plants with the pressures to switch to renewables?

Eskom is developing an executable initial pipeline of at least 2 GW of clean energy projects by 2026. The integration of large-scale renewable energy capacity is set to continue increasing as the country continues in its endeavors to decarbonise the electricity sector, as outlined in South Africa's Integrated Resource Plan (IRP). We are driving the Just Energy Transition (JET) strategy which will enable us to have our share in the renewable energy space and diversify our energy sources.

We will continue to enable the connection of new generators across the country through the grid access unit. In addition, the first-ready, first-served approach means that new capacity will be connected faster to the grid.

Furthermore, South Africa has committed to reducing its carbon footprint. The decommissioning of the older Eskom coal-fired power stations as they reach their end of life means that the capacity gap will have to be closed by alternative energy sources. The reduction in cost associated with wind and solar energy technology, coupled with the quick timeframes to establish renewable energy infrastructure, make these energy sources attractive to the market.

When we look at the security of supply and sustainability, Eskom's nuclear capability is often overlooked. Our Koeberg plant in Cape Town has just celebrated 40 years of safe nuclear operation, this year delivering 1 800 MW of reliable baseload power to South Africa.

Eskom has gone through multiple CEO changes over the years. What is the biggest challenge of this role? How is your approach different from that of your predecessors?

One of the biggest challenges of the role is foster an environment that enables Eskom to move at the pace our customers require us to. When employees are provided with a vision for an organisation by their leaders, accompanied by a path to get there, the magic can start to happen. Defining and reinforcing the purpose of employees' work, through how it impacts society or people in meaningful ways, is what really creates an environment for success.

At Eskom, as in all the places I have worked at, people are our greatest asset. Leadership definitely sets the tone and discipline required for success. I hold a firm belief that our employees had to become centre stage to enable them to rise to the challenge.

Do you have a final message?

The support of the various facets of government, key stakeholders including the mining sector, energy-intensive users, businesses, and the National Energy Crisis Committee (NECOM) remain a necessary ingredient in our recipe to ultimately succeed as a country. Together, we can co-create an energy industry that is future-ready and in alignment with global best practices.

For the first six months of Eskom's 2025 reporting year, 1 April 2024 to 30 September 2024, the unaudited results show remarkable improvement, with substantial efficiencies achieved and a profit is forecast for the full financial year. With our operational turnaround well underway and financial performance already exceeding our corporate plan targets, the business is on the path to profitability and transitioning responsibly into a competitive marketplace.■

<< 58

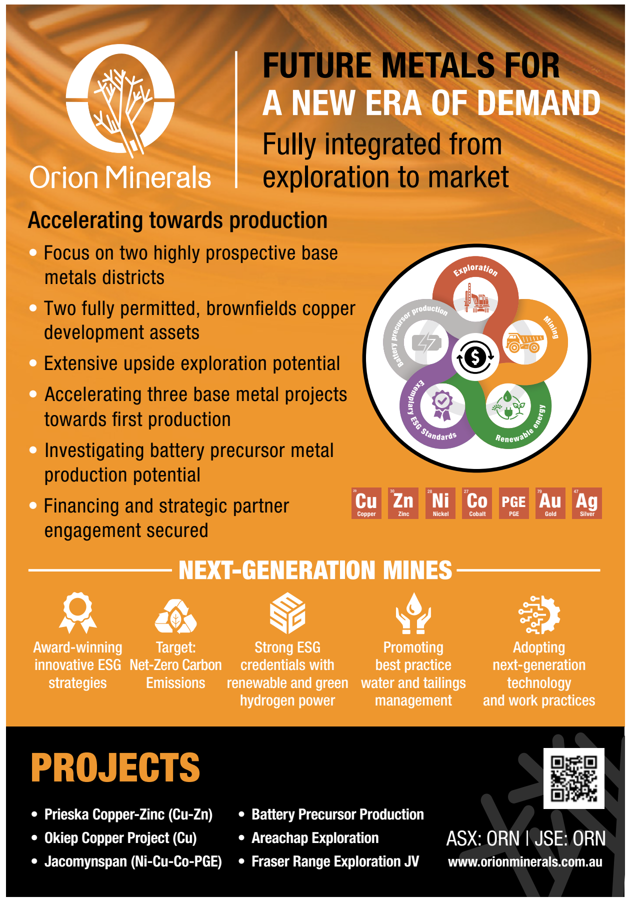
Bank towards its energy reform and the restructuring of its power sector, including the opening of the power market and investments in transmission to private companies, as well as for maintenance of existing power plants managed by Eskom. This year, South Africa also launched its largest wheeling project, adding 256 MW of renewable energy to the national grid, which will go to power Tronox Mineral Sands' operations in KwaZulu-Natal and the Western Cape.

Reforms in infrastructure are also a positive sign for investors. Transnet saw a new board appointed in 2023 that introduced a Recovery Plan to stabilize the SOE's operational and financial performance. An important reform is what the company calls the "vertical separation of Transnet Freight Rail (TFR) into a Rail Operating Company and an Infrastructure Manager". For the financial year ending in March 2024, Transnet reported improvements in total rail volumes and revenues, though still below target. Transnet is also in the process of opening the rail sector to private participation.

How to make the sun rise again

Aging mines, record-breaking deep shafts which make operations less competitive, and a dearth in greenfield projects have led to the perception that South Africa's mining industry is a sunset industry. This article will examine these signs of a so-called sunset industry, and establish whether a new sunrise is on the horizon.

It is true that echoes of South Africa's past are felt strongly in today's industry. One sign is the dominance of large mining companies, some over 100 years old, intermixed with very few junior explorers. Increased national ownership and a complex regulatory system, as well as an outdated cadaster, kept newcomers and greenfield prospectors at a distance. "Unlike mining countries such as Australia and Canada, South Africa historically lacked smaller companies focused on early-stage exploration. Large corporations like Anglo American and De Beers dominated exploration, conducting it at their own pace. Under the new regime, mineral resources belong to the state, requiring companies to apply for exploration licenses—often a complicated process," said Sipho Nkosi, chairman of South African venture capital firm Talent10 Holdings.



Mining remains deeply embedded in the country's economic and political fabric, something that surfaced quite prominently this year during BHP's failed bid for Anglo American. If there is one clear message we can take away from BHP's rejected US$39 billion takeover offer, later sweetened up to US$49 billion, it is that South Africa does not want to lose Anglo, and Anglo does not want to hurt South Africa. Even if Anglo American has moved its headquarters from Johannesburg to London, it has not forgotten its South African roots, where it was founded over 100 years ago. The country is also home to its biggest operations where it employs 40,000 South Africans, which BHP had made commitments to protect.

The proposal was primarily rebuffed because BHP asked Anglo to exit its South African platinum (Anglo Platinum/Amplats) and iron ore (Kumba Iron Ore) companies, the Australian miner being interested primarily in Anglo's copper projects in Peru and Chile, which would have made it the top producer of copper in the world. Anglo feared that leaving Amplats and Kumba independently listed would have penalized South African investors, which hold 20% of Anglo's shares. The repercussions of the Anglo demerger on South Africa would have indeed been deep. JP Morgan estimated the takeover could have led to outflows of US$4.3 billion from South Africa and weakened the rand. Unions pledged with Anglo American's shareholders to reject the takeover. Mineral Resources Minister Gwede Mantashe also said he would not support the deal, which came right before South Africa was going to the polls. Anglo obliged.

Interestingly, Anglo also later announced a restructuring that would see its Amplats and Kumba businesses demerged. The demerger of Anglo's less-performing assets is symptomatic of a broader issue in the country's mineral industry; an over-reliance on PGMs.

This brings us to the other major sign of a sunset industry – a shortage of sufficient opportunities in 'future-facing' minerals. Mining contributed US$23 billion to South Africa's GDP in 2023 (6%), while in provinces like North-West, Limpopo, Mpumalanga and the Northern Cape the industry makes up 20-30% of local GDP. Mining is also a crucial sector for the country's trade balance, representing about 58% of total exports, according to the South African Revenue Service. But the majority of these revenues come from PGMs, followed by coal, as well as chrome, gold, manganese, iron ore and diamonds.

The basket of core commodities mined remains mostly unchanged from 100 years ago. These commodities have been tested by new demands: Coal and PGMs are both threatened by the energy transition; coal for environmental reasons, while PGMs because platinum, palladium and rhodium are used in combustion engine cars, but they have not managed to penetrate the growing EV market, as explained in a report by Metals Focus.

Unfortunately, South African PGM mining company profits suffered tremendous blows due to lower commodity prices as well as structural domestic issues like power cuts, logistics constraints and inflation. Northam Platinum's CEO called the situation the worst crisis in three decades.

Coal also came face to face not only with softening prices but also with the low capacity of the rail network, operated by state-owned Transnet. According to Reuters, 2023 coal exports were the lowest in almost three decades, at 47 million t. Similarly, lower iron ore prices and sales volumes have also impacted South African companies: Kumba Iron Ore's profits fell by 26% in the first half of this year; the company has 8.2 million t of iron ore stockpiled, as reported by CNBC Africa.

Meanwhile, in currently buoyant commodities like copper and gold, South Africa's assets are mostly brownfield. The country's only copper mine is Palabora, but a handful of junior miners are reviving other copper deposits: Orion Minerals is advancing two brownfield projects, its flagship 30 million t high-grade Prieska Copper Zinc Mine (PCZM), which is fully permitted, as well as Okiep Copper, formerly operated by Newmont and Gold Fields. Orion is upgrading the historic drilling of Okiep to put together a BFS for a small-scale production while continuing to drill the rest of the mineral resource. The Okiep district used to produce 30,000-50,000 t/y of copper for 50 years. Meanwhile, Copper 360 is rebooting Rietberg, which had also been mined by Newmont and Gold Fields and is also in the Okiep district in the Northern Cape. Copper 360 is looking at a current resource estimate of nearly 4.8 million t (measured and indicated).

In the gold space, South Africa boasts the biggest reserves in the continent, according to S&P Global, amounting to 10% of global gold reserves. The largest mine is Gold Fields' South Deep gold mine in Gauteng, with a LOM up to 2096. The gold exploration sector is also characterized by brownfield developments. ASX-listed Theta Gold Mines controls 43 historical gold mines in the Eastern Transvaal Gold Fields region, home to South Africa's first gold rush, dating back 130 years. Theta's Transvaal Gold Mining Este (TGME) project contains 6 million oz of gold resources, but the company will start by mining four out of the 43 mines in the first phase, targeting production of 1.2 million oz/y (from 6.46 million t @ 5.95 g/t Au) for 12 years. Some of its mines, like Beta, boasted cut-off grades at 21 g/t Au in the past. Another company digging up South Africa's historical mines is West Wits Mining, whose Witwatersrand Basin Project (WBP) produced over 1.5 billion oz of gold (or 22% of all the gold ever mined) according to the company. West Wits sees a revenue potential of US$2.6 billion from its 4.28 million oz gold resource at a grade of 4.58 g/t Au. In the same basin, South African gold mining company Aurous Resources is looking at opportunities in tailings from the Gauta tailings retreatment project.

These examples show there is yet much to yield from South Africa's historical mines. But that does not mean South Africa does not present greenfield opportunities too. As the largest producer of PGMs in the world, accounting for 4 million oz out of the 5.6 million oz of platinum mined globally, South Africa is home to "prime PGM real estates," in the words of Roger Baxter, the executive chairman of Southern Palladium, which is developing the Bengwenyama PGM project in the Eastern limb of the Bushveld Complex, an area known for flagship PGM assets. The PGM market has gone through the bottom of the cycle, but the outlook ahead looks bright. According to Baxter, the decline seen in recent years was due to widespread fears that EVs will replace traditional cars, fears that have not materialized, with EV adoption rates dropping recently. Also, platinum remains relevant for hybrid cars, which are seeing higher demand. By the time Bengwenyama comes into production in 2028-2029, the market will have reached a deficit.

"It is important to remember that peaceful transitions of power may not have been possible in many African countries 20 years ago, but today we see a much greater level of stability that reassures investors."

Stephen Smithyman, CEO, **Kanu Equipment**

South Africa also offers interesting projects in critical minerals directly tied to the energy transition. Manganese Metal Company (MMC) is building a high purity manganese sulphate monohydrate plant to feed into the battery markets, while African Rainbow Minerals and Afrimat are developing REE projects. These would open a completely new segment for South Africa. Sam Mokorosi, head of origination & deals at the JSE told GBR that the exchange is working on originating more listings in vanadium, lithium, copper and rare earths, acknowledging that there are not enough listed battery metal opportunities in the country. A flow-through-shares scheme, which has been successful in Canada, is also being debated in South Africa as a way to encourage more listings. Another catalyst, this one already in motion, is the launch of a new online cadastral system, currently being piloted by the DMRE and set to launch by mid-2025. The new system would help with the backlog of applications (estimated by the Mineral Council to be in the 3,000 range) and unlock exploration in the country.

Some recent mining transactions are also worth noting. A US$1 billion deal from Abu Dhabi's F9 Capital Management into Q Global Commodities, owned by South African coal investor Quinton Van der Burgh, could propel more strides in green metals like lithium, copper and nickel across the Southern and Eastern African region. In manganese, Menar acquired last year the ferromanganese smelting complex from Samancor. This used to be the world's largest ferromanganese smelter, processing 2 million t/y of manganese, but it was put on care and maintenance in 2020. Menar wants to use coal from a project it owns next to the smelter and explore cleaner energy options like solar and waste-to-energy projects.

In another project getting a new lease of life, the South African business of Rio Tinto (Richards Bay Minerals) plans to resume a US$463 million expansion at its Zulti South project, which was halted in 2019, mostly due to insecurity issues threatening its workers. ■

Andries Van Heerden

CEO

AFRIMAT

Could you provide a broad overview of Afrimat's current business?
Our business is built on two legs: construction and mid-tier mining. Under the construction materials business, we operate an extensive number of quarries across South Africa. The mining division encompasses bulk commodities, which includes iron ore, manganese and anthracite mines; industrial minerals such as lime and chemical-grade limestone for niche markets; and what we call our future minerals and materials division, at the core of which is our Glenover project in the Limpopo region. Glenover contains both phosphate and rare earths – we are already operating the phosphate mine, producing phosphates for NPK fertilizers, and we are currently developing the rare earths operation, doing R&D to see if we will go for pyrometallurgy or hydrometallurgy beneficiation. This is a unique project for South Africa, where there are no Rare Earth Element (REE) projects in operation yet. We would like to potentially bring in an international partner with experience and knowledge in the REE space to help accelerate the learning curve. Additionally, we offer full pit-to-port solutions to the mining, construction and quarry industries throughout Southern Africa.

How can South Africa become an easier, better place for mining operators?
Our regulatory environment can be very limiting for business growth. A more supportive approach by the Department of Mineral Resources (DMRE) can go a long way to accelerate growth in the mining industry of South Africa. The industry has evolved over the last 20 years and mining companies operate at high standards of safety and social responsibility, willing to make positive contributions to the country. Something else our authorities must work on is the amount of red tape. Improving the discipline around reaching deadlines must also be improved, for example the DMRE is supposed to process an Environmental Impact Assessment (EIA) within 12 months, but we have been waiting on a critical one for 17 months and it is still not done. These delays and inefficiencies can put people's jobs on the line. ■

Richard Duffy

CEO

PETRA DIAMONDS

Could you provide an overview of the latest developments?
Most recently we announced our operating update for the Q1 of FY25 as well as final sales results for Tenders 1 and 2 in October. Overall, diamond production increased 7% from the previous quarter on the back of solid performances from our Cullinan mine and Williamson, with Finsch transitioning from a continuous to a two-shift operation.

Reflecting our agility to respond to weaker market conditions, we took the strategic decision to defer the sale of the majority of our South African goods from Tender 1 in August/September until October to support steps taken by major producers to manage supply. Our combined first and second tenders indicated continued weakness in the rough diamond market, although this was more than offset by Petra's product mix and overall average prices increased 13% compared to the previous tender, with product mix contributing 22%.

How are ESG requirements and regulations evolving in the diamond space?
In terms of regulation, there are the G7 sanctions that have come into play and put more onus on provenance and traceability. While we always had some form of traceability, particularly for Petra as we have a strong heritage with our mines, this has developed and evolved the way in which we will communicate this information. We are rolling out traceability technology for our South African operations which will enable the tracing of our +0.5ct gem-quality diamonds from mine-to-finger. This will provide consumers with assurance and verification around provenance and origin along with information on our sustainability credentials (including social and community projects), which are supported through purchases of our diamonds. We believe traceability technologies will further differentiate natural diamonds through highlighting their rarity, uniqueness and benefits to stakeholders. ■

Louis Nel

CEO

MANGANESE METAL COMPANY (MMC)

Could you introduce MMC?
MMC operates the world's oldest refinery of high-grade electrolytic manganese metal (EMM) and is the only EMM producer based outside of China. Our facility is based in Mbombela (Nelspruit), South Africa, close to the border with Mozambique. We have been in operation since 1974. Until about 15 years ago, we were part of BHP Billiton, processing ore from South32's mine in Hotazel in the Kalahari desert. After BHP's divestment, we became a private company, but we continue to process ore from the same mine as part of a long-term agreement with South32. We process around 80,000 t/y of manganese ore, either fines or mine slimes, producing 28,000 t/y of manganese metal. 95% of our product is exported. Though steel and aluminum industries have always been our primary industries, in the last 10 years a large portion of our product finds home in the cathode material of lithium-ion batteries (LIB). MMC is one of only two non-Chinese companies selling refined manganese in the EV space.

Could you summarize MMC's advantages in manganese beneficiation?
MMC is the largest supplier of manganese units for LIB's type precursor cathode active material (PCAM) production outside of China, supplying 40% of all manganese units for this market. We are building a 6,000 t/y manganese sulfate plant in South Africa, taking ore fines and ore slimes with two routes available, either electrowinning after we have put the manganese in solution, or crystallizing it as a sulfate. We have the advantage of starting with either manganese ore and going into refined material (EMM or HP $MnSO_4$), which is more CapEx intensive but low OpEx, or starting with metal (EMM) and going to HP $MnSO_4$, HP Mn_3O_4, HP $MnPO_4$, or HP $MnCO_3$, which is lower CapEx but higher OpEx. South Africa is extremely well-positioned both from a geological viewpoint, holding the vast majority of the world's manganese resources, and from a geopolitical and human capital point of view. ■

Roger Baxter

Executive Chairman

SOUTHERN PALLADIUM

Could you provide an overview of the Bengwenyama PGM project and key milestones to date?
Southern Palladium listed on the ASX in June 2022, raising US$19 million in the IPO. At every step of our journey, we have outperformed expectations. Since the listing, we spent US$15 million in exploration, proving up a 40 million oz resource at our Bengwenyama project in South Africa. At the beginning of 2024, we produced a scoping study, which was shortly followed by a PFS released in October. The PFS demonstrated Bengwenyama as a significant, tier-one, low-cost, high-grade, and close-to-surface PGM deposit. Southern Palladium is now ready to move to the DFS in 2025, with the goal of reaching a final investment decision (FID) in 2026. We completed the environmental authorization and community consultation work, and are expecting the mining right to be granted in Q2 2025.

What can you tell us about the PGM "neighborhood" where the Bengwenyama project is located?
We are located on the Far Eastern limb of the Bushveld Complex, in what can be called a prime PGM mining real estate – with Anglo American Platinum's 50 million oz Modikwa mine and African Rainbow Minerals' 26 million oz Two Rivers project as our neighbors, as well as two Eskom substations nearby.

The Bengwenyama project has a 29-year LOM based on current resources, but the upside potential and the opportunity to increase the LOM is immense. The socioeconomic impact of developing the project is also commensurate. Bengwenyama will generate direct employment for 4,500 people; export earnings and tax revenues will benefit the country and significant opportunities and development will accrue back to the local community. Southern Palladium owns 70% of the project, while the remaining 30% stake is owned by our local partners the Bengwenyama people who are represented through the Bengwenyama Traditional Council and Royal Family. The Bengwenyama project is a flagship not just for Southern Palladium, but for South Africa. ■

Southern Africa

Spotlight on Namibia

Meandering paths

Image by Bannerman Energy

On average, there are only three people per every square kilometer in Namibia. In reality, you could pass hundreds of kilometers before meeting another human being in Africa's least-densely populated and 15th largest country. The combination of vastness and sparsity is a good starting point for understanding Namibia's mining industry. Namibia is not short of mineral riches: 8% of the global uranium reserves are found mostly in the southwest of the country, in the Namib desert. Diamonds have also been mined for over a hundred years off the northern and southern coasts, where the Namib, the world's oldest desert, meets the world's busiest ocean, the Atlantic. In the Erongo, Kunene and Otjozondjupa regions, Namibia has lithium, REEs, tin, copper, graphite and gold, while the southernmost region of Karas is known for zinc. But despite its geological vastness, Namibia has not managed to create scale, both in terms of mining volumes or investment values, with the exception of uranium, of which Namibia is a notable producer.

Namibia has all of the ingredients to be Africa's most attractive mining jurisdiction. It already ranks 4th out of 22 countries in the continent for investment attractiveness, as surveyed by the Fraser Institute. Despite being one of the youngest countries in the world, formed in 1990 after gaining independence from South Africa, Namibia is an example of stability, with democratic elections held regularly and constitutionally. It also has one the best records of safety in the continent, ranking 7th in Africa in the Global Peace Index. Namibia checks out on other indexes too: It scores well in economic stability by most credit rating agencies; It has lower overall corruption levels compared to other African countries, as assessed in the 2023 Corruption Perceptions Index by Transparency International; and it has a good overall level of infrastructure, according to Statista's Africa Infrastructure Development Index (2022). Judging by the way our interviewee's expressions lit up when asked to describe the benefits of Namibia, there's more to Namibia than these statistics convey - an otherwordly beauty hard to empiricize – although, most tourism lists also place Namibia in the top most beautiful countries in the world.

Based on these qualities, Namibia should be a top investment recipient, yet mining FDI does not flow in the billions of dollars as we see in other countries like Zambia or Ghana. Projects are rather dispersed across multiple sub-sectors and investments have been generally modest. GDP from mining averaged at around US$2.75 billion/y over the last 24 years, but in the first quarter of 2024, mining's contribution to GDP reached an all-time high at US$5.19 billion, with developments across the commodities spectrum. These were primarily inspired by an increase in commodity prices. Leveraging improved pricing, Paladin has restarted the Langer Heinrich uranium mine this year, and multiple uranium developers are accelerating their projects in the country.

In the gold space, Dundee Precious Metals has announced the acquisition of Osino Resources, the developer of the Twin Hills gold project in the Erongo region of Namibia. But the two large gold mines in the country are getting old. Otjikoto, the largest gold mine, is nearing end of life after 10 years of production. Its operator, Canadian miner B2Gold, has released a mineral resource estimate on the Springbok Zone extension of the Antelope deposit, 3 km away from its Otjikoto mine in Namibia, which would allow the miner to supplement the processing of stockpiles from Otjikoto through 2030. The country's oldest gold mine though, the Navachab gold mine, also in the Erongo Region, could also see an expansion. Navachab was sold by Anglo Gold to QKR 10 years ago and has gone through some financial difficulties in recent years, but the executives of QKR say they are now ready to expand the plant.

In the copper sector, we note a similar small industry, mixing old assets, some of which have been on care and maintenance or suspended, with new targets. Namibia's only copper mine, Kombat, was recently restarted by Canadian company Trigon Metals. Kombat had been in production for 45 years up until 2008. Currently in development is the Haib copper project, previously explored by Rio Tinto and Teck Resources and currently operated by Koryx Copper. Koryx recently completed C$18 million in financing and has appointed a new CEO and COO in November 2024. Consolidated Copper Corp (CCC) is a new actor in Namibia's copper. Its founders saw an opportunity in Namibia's brownfield assets.

While uranium, gold and copper projects have benefited from a positive price environment, other projects in Namibia's diverse commodity basket had to advance despite, rather than thanks to, external conditions. Zinc has been particularly under pressure. The country's cornerstone zinc mine, the Rosh Pinah zinc-lead-silver mine, could see a re-awakening. Located close to the border with South Africa, Rosh Pinah operated for 54 years under different owners, Exxaro Resources selling it to Glencore who then sold it to Trevali. Trevali later entered liquidation following a deadly flood at its other zinc asset, the Perkoa mine in Burkina Faso. Appian Capital finally bought the Rosh Pinah mine and plans to bring it to its former glory, increasing mill throughput from its current 0.7 million t/y to 1.3 million t/y. Namibia's other zinc asset, the Skorpion mine belonging to Vedanta, could also change hands, though Vedanta's proposed sale of the asset to Hindustan Zinc was blocked by shareholders. Skorpion remains on care and maintenance.

Like most countries hosting minerals related to the energy transition, Namibia has also attracted more interest in lithium, graphite and REEs in recent years, but volatile pricing has left these projects hinging on the fine thread of financing. Andrada Mining, the operator of the Uis tin mine (with potential lithium and tantalum by-product) has recently sparked the interest of Chile's SQM, the world's second-largest lithium producer. SQM is providing financing as part of an earn-in agreement for up to 50% of the Lithium Ridge mining license at the Uis project. Meanwhile, lithium explorer Lepidico has unfortunately been placed under voluntary administration and is not managing to finance its Karibib lithium project in the country. Graphite developer Northern Graphite has also had issues financing its Okanjande graphite project; the company eventually decided to place the asset under care and maintenance until it finds viable funds.

Antler Gold is trying a different model, as a project incubator and generator with a diversified focus on gold, copper and critical metals in stable jurisdictions, with Namibia being one of these shortlisted countries. This September, Antler sold its Erongo Central gold project to Fortress Asset Management for US$5.5 million, while retaining a net 2% net smelter return (NSR) royalty.

Out of 162 existing licenses in Namibia, only 62 are currently active. On the surface, Namibia's challenges are not insurmountable. Water scarcity, high electricity costs with 61% of the country's electricity being imported, higher corporate taxation compared to other countries in Africa (at an average of 37.5% corporate tax), and infrastructure issues due to the large span of the country, are the most evident hurdles. If we dig deeper, however, Namibia's main stifling shortcoming is its lack of a clear policy direction that would give investors the ultimate incentive. Four years ago, Namibia began a process to revamp the 1992 Minerals Act, and a Minerals Bill (draft) was released in 2022; this included a proposal to raise the upper royalty rate limit for base and precious metals, nuclear fuel minerals (uranium), and industrial minerals, as well as introducing so-called "windfall" corporate taxation. At the same time, Namibia mandated a minimum of 15% local participation ownership. Moreover, the New Equitable Economic Empowerment Bill (NEEEB), similar to South Africa's black economic empowerment legislation, has been in draft for over a decade. Another legislation at the draft stage is the Investment Promotion and Facilitation Bill, which is feared could create more bureaucratic hurdles for investors by requiring another set of approvals from the Ministry of Trade Industrialization and SME Development, on top of obtaining mining licenses and environmental clearance certificates. In 2024, the country also banned exports of unprocessed lithium, REE, graphite, and other critical minerals.

These policy uncertainties have already eroded Namibia's Investment Attractiveness Index (IAI) within the Fraser survey; the country's upgrade to the 4th most attractive mining country (up from 6th) in Africa therefore is more of a result of deteriorating conditions in other surveyed countries, as well as a more lucrative commodity environment, rather than improved conditions within the country. Without a cohesive and calculated policy push of its own, Namibia's path to becoming Africa's premier mining jurisdiction will remain a meandering one. ■

Tom Alweendo

Minister of Mines and Energy

GOVERNMENT OF NAMIBIA

Can you introduce the Ministry of Mines and Energy and outline its mandate and goals for Namibia's mining and energy sectors?

I have overseen the Ministry of Mines and Energy since April 2018. The Ministry serves as the custodian of Namibia's minerals and energy resources. Mining especially is one of the most significant sectors of the Namibian economy, contributing over 50% of our revenue and up to 15% of our GDP. Energy, particularly with the recent oil discoveries, is becoming increasingly important as well, potentially eventually overtaking mining in terms of its significance to our economy. We seek to leverage these sectors as catalysts for broader economic development.

Mining is a significant contributor to Namibia's economy. How is this translating into benefits for Namibians?

Historically, African nations, including Namibia, have often found themselves on the losing end of resource extraction deals. Our resources have been exploited without generating equivalent benefits for our people. Recognizing this, Namibia is redefining its approach to resource management. In the case of critical minerals like lithium and rare earths, we are taking proactive steps to ensure that value addition occurs within our borders. This means evaluating and processing these minerals locally before export, thereby maximizing the economic benefits for Namibia.

What are the key advantages that Namibia offers for investment in the extractive industries?

Namibia offers a great investment environment with robust infrastructure, a safe environment, political stability and a favorable regulatory framework. Our country is rich in mineral and energy resources, making it an attractive destination for investors seeking long-term opportunities. Additionally, Namibia's commitment to sustainable development and good governance ensures a conducive business climate and mitigates investment risks. We prioritize transparency, accountability, and stakeholder engagement to build trust and confidence among investors. Moreover, Namibia's strategic location in southern Africa provides access to regional markets and opportunities for collaboration and partnerships. Finally, Namibia is simply a nice place to live and work in, and this is reflected by our booming hospitality and tourism sector. ■

West Africa

Spotlight on Ghana

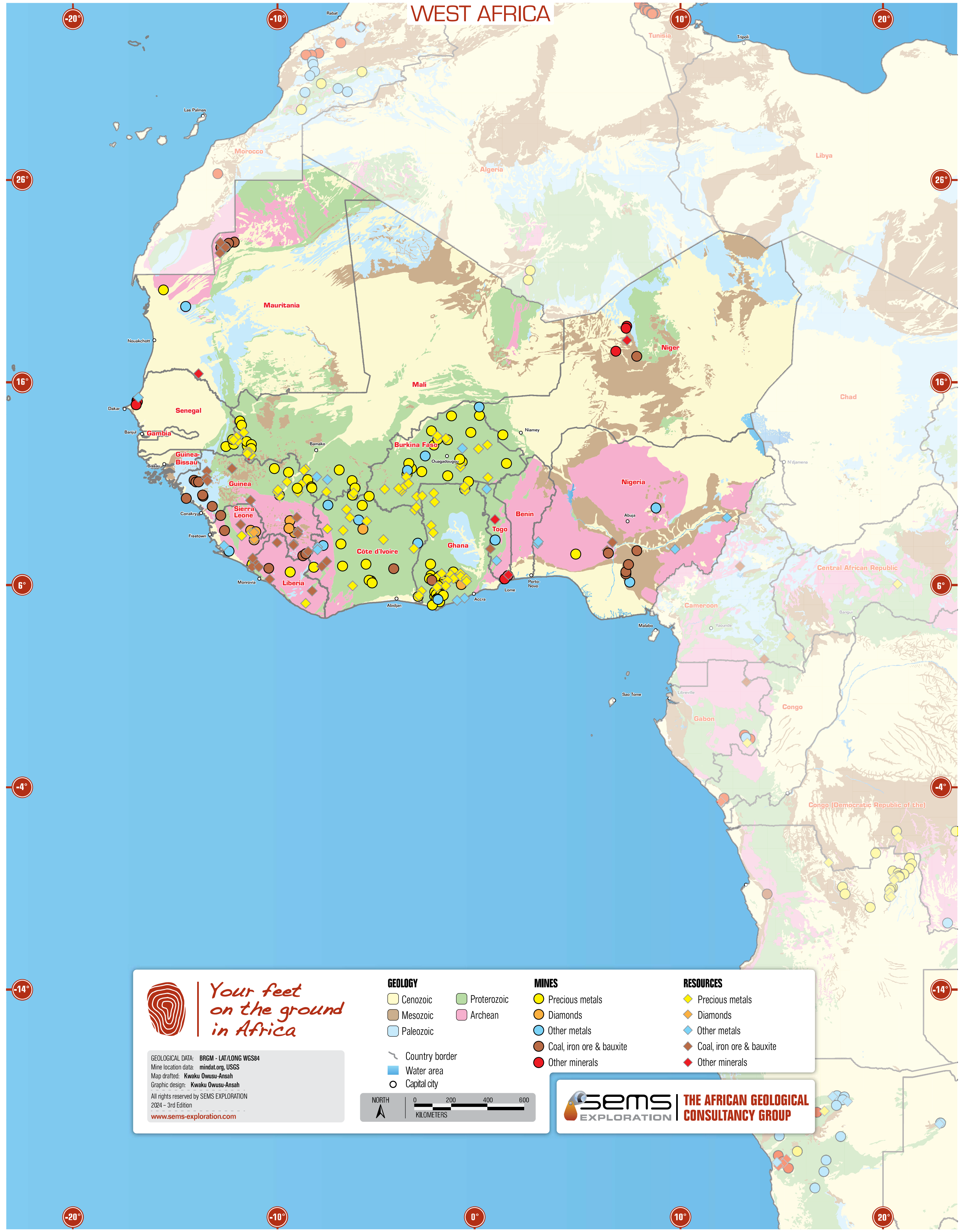
Land of kings

'Ghana' is what the Sonike people of the Ghana Empire would call their king, meaning 'warrior king'. Another address was 'kaya maghan', or 'king of gold', the region being famous for its role in the trade of gold, found mostly in alluvial deposits or dug from few-meter deep shallows. Over a thousand years later, the Republic of Ghana has turned, in mining terms, into another kind of kingdom – a kingdom of gold majors. Ghana's gold mines are operated by the world's leading majors. The number of mines can be counted on one's fingers, yet they are enough to crown Ghana as the leading gold producer in the continent. In 2023, Ghana produced just over 4 million oz of gold, according to the Chamber of Mines, and is expected to increase its output to up to 4.5 million oz in 2024.

Gold Fields alone accounts for half a million oz/y of gold from its Tarkwa mine, while its Damang mine is in its last two years of life, processing stockpiles. AngloGold Ashanti contributes another half a million oz/y from its two mines; the 268,000 oz/y open-pit Iduapriem mine close to Tarkwa and the 224,000 oz/y underground Obuasi mine, close to the city of Kumasi. Newmont brings a huge contribution of 643,000 oz/y from the Ahafo surface mine, as well as its Akyem 422,000 oz/y surface gold mine. Perseus is the only mid-tier producer among these leading majors, its Edikan mine pouring over 250,000 oz in the last year, about half of what the Australian miner produces a year from its three producing mines, two of which are in Côte d'Ivoire. Galiano Gold's Asanko Mine also produces around 130 Koz/year. Added up, these seven mines together account for about 3 million oz/y of gold produced in Ghana. The remaining 1 million oz/y comes from small-scale production, which has increased significantly in recent years.

Between these very large players and the very small artisanal and cooperative operations there are few explorers and developers to count. The development projects feeding Ghana's growing future outputs come again from the majors. The most significant is Newmont's Ahafo North development, an investment estimated at around US$1 billion that will add between 275,000 and 325,000 oz/y once it is complete in the second half of 2025. The Ahafo North deposit contains 3.8 million oz of reserves and 1.4 million oz of resources, with a current LOM of 13 years and potential for expansion. Asante Gold is the main newcomer that has emerged from a small junior into a serious developer and producer by acquiring several of Ghana's historical mines, namely the Bibiani gold mine from mid-tier Resolute Mining and the Chirano gold mine from Kinross. This year, Asante has also shown interest in the Akyem mine, which Newmont is selling as part of its larger plan to raise US$2 billion for the acquisition of Newcrest Mining. Other bidders with experience in the region have shown interest in Akyem, including Perseus Mining and Chinese companies Zijin Mining, Chifeng Jilong Gold Mining and Shandong Gold. Shandong is also behind Ghana's only greenfield gold project coming into production, Namdini, which it acquired from Cardinal Resources. Namdini is preparing to start production this year, expected to pour 350,000 oz/y and become one of Ghana's largest mines.

The last time Ghana saw a greenfield gold project commissioned into a mine was a decade ago, with Newmont's Akyem project. One active exploration project is Enchi, developed by Canadian company Newcore Gold. Newcore recently published a PEA that outlines a case for a smaller production compared to the scale of other mines in the country at 122,000 oz/y for 10 years, with a short payback and an NPV of US$371 million. But looking at the geology of the Bibiani belt, Newcore executives believe Enchi has a much greater upside, both from additional undrilled targets and



from the mostly untested underground. "Our current deposits all remain open along strike and at depth. Enchi is still underexplored for sulfide potential with the vertical depth of all the pits containing our resource within the PEA only defined down to an approximate vertical depth of 75 m. The mines sitting along trend with Enchi, including Asante Gold's Chirano and Bibiani mines as well as Newmont's Ahafo mine, are defined down to a depth in excess of 1 km below the surface, which is telling of the geological characteristics and potential of the area," said president and CEO Luke Alexander.

There are various explanations for Ghana's lack of a more diverse junior exploration sector. A high tax burden, fewer available licenses, as well as the geological structure of deposits growing in size and grade underground, create higher entry barriers. Jeff Quartermaine, the managing director and CEO of Perseus Mining, offered his thoughts: "In a mature mining jurisdiction like Ghana, the government has perhaps been less accommodating compared to other countries like Côte d'Ivoire. For example, we do not have a fiscal stability agreement or similar arrangement with the Ghanaian government, even though we have been in the country since 2011. Without clarity on the rules, the level of risk increases, making it difficult to plan. That said, popularity ebbs and flows, and leadership changes. Ghana may not be the most popular destination right now, but the country's geological potential is undeniable. Sooner or later, people will find a reason to return."

> *This prolonged period of record-breaking prices will soon translate into increased investment in early-stage projects, as there are many under-funded juniors operating in West Africa that provide exciting investment opportunities.*
>
> Simon Meadows Smith, Managing Director, **SEMS Exploration**

GalamState

Quartermaine also highlighted other indirect obstacles, such as the competition for farmland. It is said that what cannot be grown, must be mined, and Ghana has distinguished itself as both the top producer of gold in Africa as well as the second largest producer of cocoa, both industries being central to its economy. The high cocoa prices of the last few years hiked up compensation prices for exploration licenses. However, another even stronger deterrant to exploration might be the spread of illegal mining, which is a common enemy for both the mining and the agriculture sectors, destroying precious land for both. Quartermaine experienced firsthand the impacts of illegal miners: "Just recently, we acquired three exploration licenses adjacent to our Edikan mine and we successfully found a deposit (Agyakusu) that we are looking to bring into our mine plan. We were offered the property between Agyakusu and Edikan but have been reluctant to commit to a Sale and Purchase because we would have been liable for restoring the extensive damage caused by illegal mining. Unless the government is willing to indemnify investors against damage done by others, the restoration costs are a significant deterrent."

Officially, Ghana's mining sector directly hires 11,284 people, according to the Ghana Chamber of Mines, but it is estimated that there are over a million people working in small-scale mining. While production from the large-scale sector increased by almost 1 million oz/y in the last 10 years, output from small-scale mining jumped from 100,000 oz/y to 650,000 oz/y in that same period, a six-fold increase. More than 300 registered small-scale mining groups operate in the country, but there are also unregistered, illegal miners known locally as 'galamsay' that seem to spread out of control. These are not only locals but also Chinese and West African foreigners, noted ISS Africa.

The impact of galamsay has been devastating for Ghana's environment. Officials suggest 34 of the country's 288 forest reserves have been impacted. Water sources have also been severely polluted by illegal mining activities. 60% of the country's main water bodies are currently polluted, impacting the health of nearby communities and threatening the country's water availability in the very near future, with major rivers like the Pra, Ankobra, Oti, Offin and Birim being contaminated.

The situation is reaching boiling point, with intense protests against galamsay leading to a nationwide lockdown in September. The operations launched by authorities against illegal mining sites ever since the issuance of the 1989 Small-Scale Mining Act do not seem to solve the problem. Government after government has tried to combat the problem, trying both force and friendliness. Violent clashes between mining companies and illegal small-scale miners in nearby communities have become more common.

For the State, the galamsay problem costs Ghana about US$2 billion each year in lost tax revenue. Security analyst Emmanuel Kwesi Aning was quoted speaking at a Civil Society Organization (CSO) meeting as calling Ghana a 'GalamState'. The problem is much bigger than fighting an abstract enemy. These are people who are supporting communities and in return have the support of their communities. Sometimes they also have so-called investors, who can be high-ranking connections, which speaks of a deeper corruption issue. Since GBR started covering the issue, we cannot report any major change in the situation – it looks like Ghana is indeed trapped in a GalamState.

Localization

As the most mature mining jurisdiction in West Africa, Ghana was a pioneer of local content laws and other localization mechanisms. In 2020, it introduced the Legislative Instrument 2431 (2020) on Minerals and Mining (Local Content and Local Participation), requiring license holders to have a program for training and recruiting Ghanaians. Simon Meadows Smith, the managing director of SEMS Exploration, a Ghanaian company, sees such policies as positive contributors to fairer competition in the services sector: "From our perspective, local content policies are a positive development as long as they are managed and implemented well. In Ghana, for example, these requirements have given SEMS the opportunity to work with larger mining groups such as Newmont that would previously have engaged expatriate service providers. Local content policies are demonstrating that SEMS can provide a world-class technical service in West Africa that is comparable or better to those offered by companies based elsewhere in the world."

In the same Local Content law, Ghana introduced requirements that license holders list at least 20% of their equity on the Ghana Stock Exchange. Both Asante Gold and Atlantic Lithium have been listed locally in recent years, receiving support from Ghana's sovereign minerals fund. The Ghana's Minerals Income Investment Fund supported Asante's acquisition of Chirano in 2022, and most recently poured US$33 million in Atlantic Lithium.

The next step in the country's attempt to reap more benefits from its extractive industries is local processing. Ghana wants to integrate its gold, as well as manganese, bauxite, iron ore and, most recently, lithium deeper into the local economy. This year, the country inaugurated its first commercial gold refinery, Royal Ghana Gold Refinery, as a partnership between the Ghanaian Government and India's Rosy Royal Minerals. The 400 kg of gold/day refinery currently processes gold from artisanal operations while it awaits the license to process from large gold miners.

Ghana has similar plans for its other main resources. As the world's fourth largest producer of manganese ore, Ghana exports 4 million t/y, most of which goes unprocessed directly to China. The largest manganese mining sites in the country are owned by the China Manganese Company. This year, the government announced plans of a JV with two Chinese mining companies to build a manganese refinery in the country. For bauxite, Ghana's ambition to build a smelter and produce aluminum in the country is 60 years old and continues to face challenges, especially in terms of clean energy to power the energy-intensive smelter.

The industrialization of the iron ore industry faces similar hurdles. The newly created Ghana Integrated Iron and Steel Development Corporation will be responsible for harnessing the country's resources. Lastly, Ghana is keen to see its first lithium mine come into production; Ewoyaa, developed by Atlantic Lithium. The project could produce 360,000 t/y of lithium. ■

West Africa

Spotlight on Burkina Faso

Who will mine the country's gold?

Image by Endeavour Mining

The security crisis has escalated so much in Burkina Faso that the country is now considered the most affected by terrorism in the world, according to The Global Terrorism Index 2024 report. This has led to an exodus of foreign investment, with FDI dropping by 87.26% in 2023, compared to a year before. Within that same timeframe, gold production decreased by almost 10 t, from 66.8 t/y to 57.3 t/y.

The last major mining investments in the country were made by West African Resources and Orezone, whereas established producers have held off expansions and the exploration sector has shrunk to near extinction. The current mines were built during the previous gold cycle, during which Burkina Faso was a hotspot.

When a country's operational environment becomes so challenging that its main revenue generator, in this case mining companies, considers exiting, a government is typically expected to lobby for these companies to stay. This is not the approach taken by the junta-led Burkinabé government. Emboldened by the record-high gold prices, the country wants greater ownership over mining assets. According to news agency Ecofin, President Ibrahim Traoré said in a national radio broadcast: "We know how to mine our gold and I don't understand why we are going to let multinationals come and mine it."

The Burkinabé government already jumped at the first opportunities to nationalize mining assets, starting with the Boungou and Wahgnion mines sold recently by Endeavour Mining to Lilium Mining. The two companies entered a dispute, Lilium refusing to pay the US$100 million for the sale after claiming that Endeavour misrepresented the 'financial and operating capabilities' of the mines. The two reached an agreement with the Burkinabé government, which will pay US$60 million to take control of the asset. The country established two national entities, Société de Participation Minière du Burkina (SOPAMIB), which will control the former Endeavour mines, and Agence pour la Promotion de l'Entrepreneuriat Communautaire (APEC), already operating mines in the south of the country.

Endeavour continues to operate the Houndé and Mana mines in the country. The other miners remaining are IAMGOLD, the operator of the Essakane mine, with an annual top-end guidance of 380,000 oz/y, as well as Fortuna Mining, which operates the Yaramoko mine, with only two years left of production. Fortuna does not currently plan additional investment to extend the life of mine.

> *I have reservations about the abilities of the Burkinabé, Malian, and Nigerien administrations to deliver what previous administrations failed to do. The Sahel is very much an epicenter of geopolitics and Russia is growing its influence in the region.*
>
> Marcus Courage, CEO, **Africa Practice**

A third miner is Russian company Nordgold, which operates the Bissa and Bouly mines and was recently awarded a permit to mine Yimiougou. This has led to speculations of favoritism for Russian players, whereas the licenses of Western companies are under threat. Most recently, the government expropriated TSXV-listed Sarama Resources' license for the Sanutura project. The Canadian company is now seeking compensation in an arbitration court.

Burkina Faso's break from ECOWAS and its back-turning to its former colonial ruler, France (and to the West more generally), have been compensated by the country's growing closeness to Russia. The Sahel country sees Russia as a better partner to help in the fight against terrorism, and it has replaced the former French troops with Russian ones. Al Jazeera noted that the Russian influence is also felt culturally in Burkina's capital, Ouagadougou, in film screenings, graffiti posts, or a daily radio show called "Russian Time," where the Russian language is inter-mixed with the local French. Burkina is saying "adieu" to France and "Zadaróvye" to Russia, on more fronts than we thought. ■

West Africa

Spotlight on Mali

Miners in re-negotiations with the government

Image by Endeavour Mining

The past four years have been a rollercoaster ride for mining companies with operations in Mali. Share prices of listed miners have taken multiple hits following the successive 2020 and 2021 military coups that brought the country under the rule of interim president Assimi Goïta. But these events were only the initial earthquakes. The aftershocks – an audit on backlog taxes, a moratorium on the issuance of new titles, and a new 2023 Mining Code increasing government ownership and royalty rates – were even bigger in magnitude. And then came the unexpected tsunami in the form of a complete crackdown on mining, at times taking the form of old-fashioned blackmailing passed for re-negotiations.

What caught everyone unprepared was the detention of Terry Holohan, the CEO of Resolute Mining, one of the main producers in Mali. Holohan went to Bamako for what he thought would be a routine meet-up with the tax authorities to discuss the newly implemented government changes. He was later released, along with other executives charged with forgery and damaging public property, after Resolute agreed to pay US$160 million to settle the tax dispute. Not long after, Mali announced its biggest target yet – no other than Mark Bristow himself, the CEO of the second largest gold miner in the world, Barrick Gold. The Bamako authorities issued an arrest warrant for Bristow, this time on money laundering charges. Bristow is not only one of the preeminent ambassadors for mining in Africa, but is also known for his fearless ability to navigate some of the toughest jurisdictions (he managed to get an exclusive deal for Randgold, now part of Barrick, after Mali's 2012 coup, Randgold becoming the only company in the country allowed to export bullion at that time).

This time, however, even Bristow's smooth-talking hit a wall. As a result, Barrick announced it would seek arbitration after numerous failed attempts to negotiate. Negotiations between Barrick and the Malian government over the new mining code started about a year ago and were deemed unsuccessful, with several of Barrick's employees in Mali ending up under arrest. According to Bloomberg, Barrick has offered about US$370 million to settle the tax claim resulting from the government's audit. The Loulo-Gounkoto gold complex is the largest in the country, with an annual guidance of up to 560,000 oz. Both parties know that closing the mine would lead to a situation of mutually assured destruction, but Barrick has not held back from threatening to suspend operations if the government continues to suspend gold shipments. Barrick has invested more than US$10 billion in Mali in its almost three decades of operations in the country.

> *West African states are increasingly addressing the impacts of mining on the environment, local communities and equitable value sharing. This shift has resulted in the widespread adoption or revision of local content laws in some countries.*
>
> Zana Kone,
> Managing Partner Côte d'Ivoire and Executive Partner WACA, **Forvis Mazars**

The other two big gold producers in the country, B2Gold operating the 450,000 oz/y Fekola gold mine, as well as Allied Gold Corp, operating the 200,000 oz/y Sadiola gold mine, have reached agreements with the government, settling prior taxes that were identified during the government audit. Peter Marrone, the CEO of Allied Gold, commented on the recent protocol signed with the government: "Our position was that instead of enforcing our rights within the existing convention available through 2037 and recourse to our arbitration or mediation clauses, we are better off finding a bonafide win-win between ourselves and the state to be able to move forward and develop more transparency and good faith. The agreement provides for the renewal of the mining permit for the Sadiola mine and the development of the Diba deposit, following the derogations of the new mining code."

Hummingbird, the fourth producer in the country, announced this December that it will sell its remaining shares to Nioko Resources.

During this time, junior miners saw their shares taking a deep vertical plunge in November as negotiations between their host government and their larger peers have been unfolding. The silver lining is that the new mining code at least provides them and their shareholders with clarity on the new tax regime. The higher royalty rates will weigh on future operating costs and need to be accounted for in pre-production technical studies.

Among the main explorers in the country are Cora Gold, Toubani Gold, Compass Gold, Roscan Gold, Desert Gold and Sylla Gold. Despite the recent instability in the country, good news continues to stem from Africa's third largest gold producing country: Cora highlighted an attractive, high-grade, low-strip open-pit operation through its recent DFS at the Sanankoro project, based on a circa 1 million oz resource with an additional 1.5 million oz in exploration targets. The company secured conditional debt and equity finance, and the Cora stock ends the year on a high note. Compass has also announced a joint production agreement with SMAT, a Malian business, to start toll-treating Compass' ore at the adjacent facility of SMAT. The Canadian junior's share price has appreciated 71.45% year-to-date. ASX-listed Toubani is also in a good position, securing funding to move its Kobada gold project to a DFS stage.

The new mining code has also brought complications for the two lithium developers competing to bring Mali's first lithium mine into production: Kodal Minerals and Leo Lithium. For UK-based Kodal, the new tax requirements created a dispute with its JV partner, Chinese company Hainan, over which of the two companies should withstand the US$15 million tax payment to the government. Hainan is putting US$117.5 million into the Bougouni lithium project but does not want to bear the additional tax. Leo Lithium, on the other hand, decided to sell its 40% remaining stake in the Goulamina lithium project to China's Ganfeng Lithium, which holds the majority interest, after failing to reach an agreement with the government over the ownership of the project – under the new code, the government's ownership would increase from 20% to 30%. ■

Adama Soro

President

EFEDCOM (ECOWAS FEDERATION OF CHAMBER OF MINES)

Can you introduce EFEDCOM and give an overview of the organization's key mandate?

EFEDCOM's mandate is to foster closer collaboration between West African countries in the mining sector, advocate for efficient policies for a strong, sustainable mining industry that benefits all West African countries, and promote trans-regional synergies. If each country implements its own regulations on local content, for instance, there will be disparities, but by creating more integrated frameworks, we can facilitate investment across the region. Geology has no borders and producers like Endeavor Mining or Barrick Gold have mines in various West African countries. West Africa is competing as a region on the global stage; if we want to gain leverage, we need to work together as a single bloc.

What is EFEDCOM's outlook for the West African mining industry moving forward?

Less than 10% of West Africa has been explored, leaving huge upside potential for future growth. Although security challenges and political instability continue to hinder parts of the region, geology will remain there in the long term. The entire region holds immense potential, in gold and critical minerals. Important discoveries of battery minerals have been made in Mali, Côte d'Ivoire and Ghana. Our biggest challenge as a region is the unsteady regulatory environment which blocks the geology from shining in the eyes of both internal and external investors. More than that, we are proud to see the West African workforce becoming recognized as experts and leaders in mining.

Do you have a final message for our audience?

I always advocate to policymakers to think longer term and bring the private sector to the discussion table. As EFEDCOM, our mission is to keep the dialogue open and bring collaboration beyond the national level. We will continue to advocate for regional investment, encouraging various stock exchanges to work together to bring more equity into the mining industry from regional investors. ■

West Africa

Spotlight on Côte d'Ivoire

The greenfield heart of West Africa

Following the rapid decline of political stability in both Mali and Burkina Faso, Côte d'Ivoire is becoming an embodiment of West African opportunity, especially when it comes to greenfield exploration. Besides the older-established gold mines, namely Endeavour's Ity and Barrick's Tongon, the country has seen the successful development of multiple discoveries into gold mines in recent years, including Endeavour Mining's Lafigue, innaugurated in 2024, Fortuna Mining's Séguéla and Tietto Minerals' Abujar, both started in 2023, and Perseus' Yaouré, started in 2021.

Côte d'Ivoire's gold production jumped to a record high in 2023, and is set to reach a new record for 2024, at 56 tons of gold. Furthermore, all of the above named players quote important discoveries besides their existing mines. These successes, together with multiple large discoveries, like Montage Gold's Koné project and Centamin's Doropo, have turned the country into a magnet for greenfield exploration. Mako Gold, Awalé Resources, Aurum Resources, Sama Resources and Turaco Gold are among the juniors exploring the country for gold.

The profile of the Ivorian mining industry, characterized mostly by a mix of small gold juniors and diversified midtiers focused on the West African region, is set to change with the entry of more majors. Anglo American has bought Centamin, thereby coming into possession of the 1.9 million oz Doropo gold project. Newmont has entered Côte d'Ivoire through a JV with Awalé Resources for 30% of its Odienné property, with four existing discoveries. Chinese player Zijin Gold has taken a 9.9% equity position in Montage, which is developing what could become the country's biggest mine to date at its advanced Koné gold project. The announced exit of Barrick Gold, which is seeking a buyer for its 24-year-old open-pit Tongon mine, will soon bring another new name into the Ivorian mining community.

The increasingly nationalistic political tendencies found in the Sahel countries has sent fears that Côte d'Ivoire could follow in the steps of its neighbors and tighten the fiscal burden. This year, officials said the country will review its mining code to increase state profits. Peter Ledwidge, the CEO and founder of Mako Gold, believes the country will not repeat the mistakes of its neighbors and risk chasing investors away. "The government is thoroughly supportive and holds a 10% free-carry into assets, making themselves directly interested in seeing projects taking off. The only issue is that permitting is a very slow process which is frustrating for investors and their shareholders, but the same is true of other places like Queensland or Western Australia. The important aspect is that no shortcuts are taken and the right processes are in place." ■

Jorge Ganoza

CEO

FORTUNA MINING

To what extent does West Africa contribute to Fortuna Mining's performance and growth today?

In the second quarter of FY24, Fortuna Mining reported sales of US$260 million with adjusted EBITDA of US$113 million. This strong performance is largely driven by our two mines in West Africa, Séguéla in Côte d'Ivoire and Yaramoko in Burkina Faso, which together account for 55% of our gold equivalent production of 116,000 oz. Moreover, our West African mines deliver the highest margins, with Séguéla being our lowest-cost operation at an AISC of US$1,100/oz.

What have been the latest exploration highlights in Côte d'Ivoire to increase the resource base at Séguéla?

At Séguéla our exploration efforts have been incredibly successful, leading to two major discoveries: Sunbird, announced in 2022, where we outlined a maiden (inferred) mineral resource of 3.4 million t at an average grade of 3.16 g/t Au containing 350,000 oz of gold, and the Kingfisher prospect, a 2 km mineralization strike with exceptionally high grades going up to 23.7 g/t Au at over 17 m.

With Yaramoko nearing its end of life, what is your end plan for the mine, and to what extent does the operational environment play in Burkina Faso into that decision?

We have no plans to expand our presence in the country at this time. The overall environment is very different from what it was five years ago.

Fortuna has strengthened its presence in West Africa through the acquisition of Chesser Resources and the Diamba Sud project in Senegal. What made this project a standout?

Diamba Sud is situated in one of the most prolific gold belts in West Africa, the Senegalese-Mali Shear Zone, which is home to world-class operations like Barrick's Loulo-Gounkoto complex and B2Gold's Fekola mine. Chesser made remarkable progress in a short time and with limited resources, advancing the property from a basic soil anomaly to a 625,000-oz indicated and a 235,00 oz inferred historic JORC classified gold resource. ■

Clive Johnson

President and CEO

B2GOLD

Could you provide an overview of B2Gold's half-year production guidance?

B2Gold's total gold production for Q2 2024 was 212,508 oz, including 8,267 oz of attributable production from Calibre Mining Corp.

What are the most recent exploration updates at Otjikoto?

On June 20, 2024, the company released an initial IMR estimate for the Springbok Zone, the southernmost shoot of the recently discovered Antelope deposit, located approximately 5 km south of the Otjikoto mine in Namibia, of 390,000 oz of gold, sufficient to initiate a PEA on development of the deposit by underground mining methods, similar to the Wolfshag deposit. Subject to the receipt of a positive PEA and permit, mining of the Springbok Zone could begin to contribute to gold production at Otjikoto later in 2026.

The Antelope deposit has the potential to supplement the processing of low-grade stockpiles at the Otjikoto mine through 2031, with the goal of increasing gold production levels to over 100,000 oz/y from 2026 through 2031.

How does B2Gold protect its employees and contractors, as well as navigating jurisdictional risk, in light of insecurity and political uncertainty in Mali?

Effective security requires a three pronged approach consisting of physical barriers to access, response teams made up of skilled security professionals with government support, and a broad coalition of intelligence sources that provide warnings far in advance of any potential security threat.

A number of our employees live in the communities surrounding the Fekola complex, while others are transported to and from Bamako by bus on the national highway. Following the tragic incident that occurred on the national highway that resulted in the death of four of our employees in an instance not related to the mine, the government of Mali has increased security at this section of the highway, and employees have been transported safely through this area. ■

Ian Cockerill

CEO

ENDEAVOUR MINING

Could you comment on Endeavour's Q3 results and your outlook ahead?

Q3 was our strongest quarter this year. We posted an EBITDA of US$317 million with a free cash flow of US$97 million. Our year-to-date production is 741,000 oz, with 270,000 oz produced in the latest quarter once our Lafigué mine came into production and the BIOX expansion at the Sabodala-Massawa mine was complete.

Could you elaborate on the latest operational milestones?

Starting with Lafigué, this is a brand-new mine, with a 4 million t/y plant, and guidance around 200,000 oz/y of gold. Lafigué was built in just 21 months, and we poured first gold in July this year, in line with our track record of delivering five mines on time and on schedule in West Africa. From discovery to first gold, it took us eight years, which speaks volumes about the advantages of being in a jurisdiction where production timelines are some of the shortest in the world.

We will soon be announcing the results of the PFS on our Tanda Iguela project, which has the potential to become our third mine in Côte d'Ivoire. Tanda Iguela is one of the best discoveries announced in West Africa in the last decade, with an indicated resource of 4.5 million oz at 1.97 g/t Au and very promising upside potential.

Could you also comment on the risks of operating in West Africa?

Our host governments have been supportive and willing to see mining development, understanding the significant contributions of mining to GDP and employment. We recognize we are guests and operate within the frameworks designed by each country. I am optimistic about the many opportunities the region offers: the quick timeline to production can lead to a faster and higher return on investment, production, and exploration costs have been proven lower, and the upside on gold discoveries is unmatched. As a region, West Africa has taken the crown as the largest producer of gold in the world; two decades ago, it was an entirely frontier market. ■

Renaud Adams

CEO

IAMGOLD

What is IAMGOLD's philosophy regarding acquisitions and portfolio diversification?

For the near future, our priorities are clear. Côté Gold is already the second-largest gold deposit in production in Canada and has the potential for further expansion. Our focus is on organic growth; the resource base at Côté has nearly doubled since we started construction, and we are now sitting on a resource of nearly 20 million ounces. Our priority is to continue delineating and expanding our resources rather than seeking acquisitions elsewhere.

As for diversification into copper or other critical minerals, it is not part of our short-term strategy. While copper can complement gold operations, IAMGOLD remains a gold-focused company.

How have security challenges affected your operations in Burkina Faso, and what is the outlook for the region?

Over the past 14 months, we have avoided disruptions in our supply chain despite ongoing security challenges in Burkina Faso, primarily focusing on ensuring the safe delivery of supplies to the mine site through close collaboration with the government. While this approach has proven effective, it has increased the cost environment for operating in the country with enhanced security measures. Looking ahead, we acknowledge the security situation; however, our strong relationship with the government and solid social license to operate provide us with a foundation to manage these challenges.

Have the challenges in West Africa influenced your strategic direction?

The challenges in West Africa and investor sentiment of the region have been a consideration in our pivot towards Canada, though this strategy was already in motion once the decision to advance Côté gold mine was made. The sale of our West African exploration assets was largely driven by financial needs rather than solely by the current security landscape. While we might have been more patient in other circumstances, the shift in focus to Canada aligns with our long-term strategic goals. ■

Central Africa

Zambia and the DRC

Both sides of the Copperbelt are kicking into high gear

"Life is coming back to the Copperbelt," according to officials at the inaugural Insaka mining conference in Lusaka, Zambia. They were referring to the Copperbelt province in central Zambia. The Copperbelt, however, is better known on the other side of the border, in the Haut-Katanga province of the Democratic Republic of the Congo (DRC) - the Central African Copperbelt (CAC) straddling both countries. While Zambia is revving up efforts to spur production to 3 million t/y by 2031, up from 698,000 t/y in 2023, the DRC is steadily nearing that target, having recently surpassed Peru as the second-largest copper producer in the world by a small margin, with 2.84 million t/y produced in 2023 (vs 2.76 million t/y in Peru).

Zambia has been a somewhat underwhelming stalwart of copper production in the CAC, with over 100 years of mining history but slowly declining outputs, while the DRC has emerged as the star of the region, in 2023 alone contributing to 65% of new global copper reserves. The

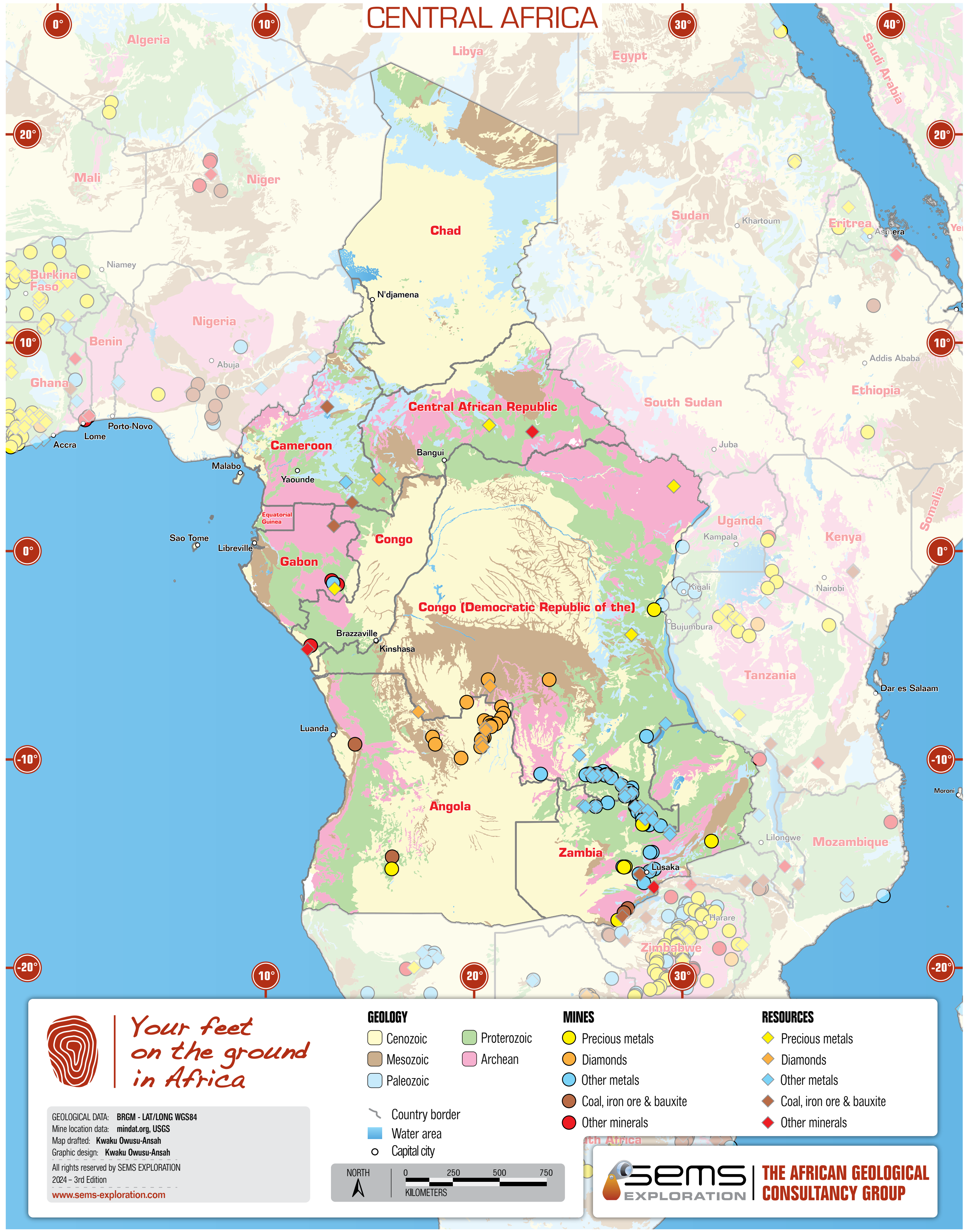
"Over the past decade, Zambia deterred investors due to multiple and inconsistent policy shifts. However, since 2021, we have seen more stability. The fact that Zambia finally has its own Mining Indaba tells the world the country is ready to be a serious mining actor again, after 100 years of mining history."

Jason Kazilimani, CEO, **KPMG Zambia**

Kamoa-Kakula copper discoveries in the DRC, among the largest ever made (containing 38 million t of copper), were enough to raise the DRC to international copper stardom. When operator Ivanhoe Mines put the Kamoa-Kakula Complex (KKC) into production and turned it into the third-largest copper mine in the world, DRC's position as a leading copper destination and its reputation for ultra-high grades were well-solidified. This year, Ivanhoe Mines made another significant discovery at its Western Forelands project, announcing an indicated resource of 16 million t at 3.6% copper grade plus 154 million t inferred at 1.95% copper at Makoko. Makoko could turn into another monumental discovery of the decade. Ivanhoe's executives believe Western Forelands could rival Kamoa-Kakula in both size and grade.

But Zambia is also coming up with a project that could rival Kamoa-Kakula: The Mingomba copper discovery made by American explorer KoBold Metals, a Bill Gates and Jeff Bezos venture. KoBold claims Mingomba is Zambia's biggest discovery in a century. At a first phase, Mingomba could produce 300,000 t/y by 2026, becoming the largest mine in the country. Ivanhoe itself has recently shown interest in Zambia. The Canadian company, which holds 50,000 km2 of greenfield licenses in the Congo, has signed an MoU with the Lusaka government to co-develop prospective projects on the Zambian side of the Copperbelt. In 2024, Ivanhoe put aside US$90 million for exploration.

Zambia is seeing unprecedented levels of investment in the copper sector. Its two largest operators, First Quantum Minerals (FQM) and Barrick Gold, have kick-started massive expansions, FQM pouring US$1.25 billion to expand Kansanshi to over 200,000 t/y by 2026,



and Barrick investing US$2 billion in the Lumwana Super-Pit expansion to double copper production to 240,000 t/y by 2028. New life is also being breathed into Zambia's stranded assets. Indian company Vedanta Resources took back the keys to the Konkola Copper Mines (KCM), which had been placed under provisional liquidation by the (former) government. Mopani, another in-limbo asset, was acquired by UAE company International Resources Holding (IRH).

Joining a line-up of Canadian, Indian and Chinese investors are new American and potentially Saudi partners. San Francisco-based KoBold will invest in the range of US$2 billion to turn the greenfield Mingomba discovery into one of the largest and highest-grade mines in the world, according to its executives. International investors are being courted to help foot the bill on recent transactions. First Quantum has been reported to be in talks with Saudi Arabia's Manara Minerals for a minority stake in First Quantum's Zambian copper and nickel assets, a potential deal worth between US$1.5 and US$2 billion, according to Reuters. This would help First Quantum cover some of its debt, especially after its flagship Cobre mine in Panama was shut down last year by the government following public protests. To start a massive underground development worth over US$1 billion and bring KCM back to life after five years of dormancy, Vedanta has courted IRH to buy 51% of the assets for over US$1 billion, but the deal fell through over valuation discrepancies. IRH has already spent US$1.1 billion to buy a majority stake in the Mopani Copper Mines, which it plans to ramp up to 200,000 t/y in the following years.

"With the 'One Country, One Nation' philosophy, Zambia is a very accommodating place, embracing diversity and fostering a positive business culture. However, access to affordable financing remains critical for supporting the growth of businesses, and interest rates remain high."

Jeff Chiila,
Founder and CEO, **Red Spot Companies**

Meanwhile, the DRC has a less diverse investor pack, with 80% of its mines owned by Chinese companies. Mines Minister Kizito Pakabomba stated that the country wants to attract "better investors, more investors, and more diversified investors," in an interview published by Bloomberg News. This year, Kinshasa opposed a deal to sell Chemaf, a copper and cobalt producer backed by Trafigura, to China's Norin Mining. According to Global Data, the DRC is coming close to the 3 million t/y copper production mark in the following year, outputs growing by about 3% annually. These estimates reflect brownfield developments like CMOC's expansions at Tenke Fungurume mine and Kinsafu mine; the Chinese player wants to produce 570,000 t of copper in 2024 and close to 1 million t/y by 2028, while also doubling cobalt output to up to 100,000 t/y by 2028.

Whereas the DRC is entirely dominated by larger mining houses, Zambia is becoming a more attractive space for copper juniors. London-listed Jubilee Metals Group, with chrome and PGM assets in South Africa, acquired two open-cast copper mines in Zambia this year. Another company that diversified from its core commodity for the sake of Zambian copper is Patriot Lithium, an American company with lithium assets in Canada and the US. Patriot acquired an 80% stake in the Katwaro copper project.

Other copper explorers advancing in Zambia are private company Zamare Resources, with four early-stage exploration projects, TSX-listed Midnight Sun Mining, with a 500 km2 licensed area at its flagship Solwezi project, and TSXV-listed Be Metals, operating the Pangeni copper project together with local JV partner Pangeni Mineral Resources. Mimosa, a local explorer, emerged from an earn-in agreement for the Kashime (now Fishtie) copper project of FQM, signed back in 2012. In 2023, Mimosa revised the deal to become the majority owner of Kashime, growing its stake to 75% once it completes a DFS.

84 >>

We see a strong opportunity to catalyse further investments and cement the DRC's standing as a global copper leader.

Kizito Pakabomba

Minister of Mines

GOVERNMENT OF THE DEMOCRATIC REPUBLIC OF THE CONGO (DRC)

What is your vision as the new Minister of Mines?

The Democratic Republic of Congo (DRC) has immense mining potential, which can be usefully put to use in the context of the current energy transition. Recognizing this, President Félix-Antoine Tshisekedi Tshilombo has emphasized placing the Congolese people at the center of our country's mineral resource exploitation. His vision prioritizes the equitable distribution of mining revenues while improving the country's business environment to attract more private investments and foster a sustainable development. In line with this, the Minister of Mines' vision is to develop a competitive and sustainable mining sector that can support DRC emergence's ambition while also contributing to the well-being of the Congolese people.

My vision is therefore anchored on four key strategic objectives, namely strengthening institutional capacities, intensifying geological and mining research, revitalizing management of the mining sector and improving management capacity.

Under the scope of achieving these objectives, the following initiatives are to be undertaken or pursued: Ensuring transparency, notably through the publication of mining contracts, in compliance with national regulations and international best practice; promote environmental, social and good governance criteria for sustainable development; strengthen the monitoring of mining operators' commitments to social and environmental responsibility; strengthen investment protection measures (stable tax regime, insurance and other guarantees against expropriation, etc.); ensure traceability of mineral substances from artisanal mining operations; strengthen measures to combat mining fraud and smuggling; establish quality assurance for national Mineral Reserves, by introducing a transparent certification system, controlled by independent audits; develop digital geo-data infrastructures; promote the metallurgical industry; and valorise the by-products of metallurgical extraction of copper, gold, 3T and other complex ores in order to capture some minor critical elements that are very demanded.

What have been the key investment and development highlights for 2024?

2024 was marked by various investments, including the increase in copper production volume with notably the Kisamfu Mining, Tenke Fungurume mine (TFM) and Kamoa projects together with the recent relaunch of the Kipushi mine developed by Kipushi Corporation (KIKO), a partnership between IVANHOE Mines Ltd and GECAMINES SA, which is going to propel the DRC among the top five global producers of zinc.

Another milestone was the production and export of the first shipment of germanium labeled 'Made in DRC' by the company Société de Traitement du Terril de Lubumbashi, a subsidiary of GECAMINES SA, the Société Générale des Carrières et des Mines.

Could you give our readers a sense of the DRC's untapped potential?

To date, less than 30% of the national territory has been explored, mostly for gold (750 t tot. reserves), diamonds (700 million carats tot. reserves), copper (80 million t tot. reserves), cobalt (6 million t tot. reserves) and tin (800,000 t tot. reserves of cassiterite), leaving a huge part of other mineral commodities such as iron, chromium, nickel, lithium, aluminum, manganese, graphite, rare earths, and phosphorus largely unexplored. ■

Zambia is ready for business, and as part of our goal to reach 3 million t/y of copper production, there have been some important announcements recently.

Paul Kabuswe

Minister of Mines and Minerals Development

GOVERNMENT OF THE REPUBLIC OF ZAMBIA

Speaking at Indaba 2024, Robert Friedland of Ivanhoe stated that the world needs 700 million tons of new copper production over the next 22 years. What role can Zambia play to achieve that goal?

As a country, we have a target to reach 3 million t/y of copper production by 2031. We are moving decidedly towards that with the new investments that are coming into the country. Once we reach 3 million t/y, we will not stop there; we will continue pushing towards 4 million t/y, then 5 million t/y... The DRC can also contribute 4 million t/y, so I believe that we will be able to meet the demand globally.

President Hichilema's speech at Indaba highlighted some of the upcoming developments in Zambia's mining industry. Could you provide a summary on the copper front?

We are looking forward to receiving more investments that can translate into social change. Zambia is ready for business, and as part of our goal to reach 3 million t/y of copper production, there have been some important announcements recently. For instance, KoBold Metals' discovery at Mingomba is an exciting moment for Zambia. It will translate into jobs for our people and economic improvement in the area where the mine will sit. The company has announced that it plans to fast-track its development.

On top of that, there is First Quantum's commitment to invest over US$1 billion to extend Kansanshi's minelife. Barrick plans to deploy US$2 billion for the Lumwana copper mine expansion. China Nonferrous Mining Corporation (CNMC) has pledged to invest US$1.3 billion over the next five years, including US$600 million to reopen shaft 28 at Luanshya. International Resources Holdings (IRH) from UAE is investing US$1.1 billion in Mopani copper mines. Vedanta of India is taking back ownership of Konkola copper mines, with significant investment. And finally, we also have Moxico Resources with the Mimbula Phase 1 project already in operation, and a plan for the Phase 2 expansion in motion.

Could you also elaborate on developments on minerals other than the red metal?

Beyond the large investment at Kansanshi, First Quantum Minerals is assigning an additional US$100 million to culminate the development of the Enterprise nickel mine. Meanwhile, Gemfields is doing investments as part of a joint venture with the Zambian government.

The country has all the minerals you can think of, so what is important is to put money on the table, start to drill and find the resource, in order to see these projects become mines and receive investment sums like the ones discussed here.

In light of what happened to First Quantum in Panama, how important is for Zambia to maintain a stable regime for mining investment?

Our message has been that we are committed to maintain a stable policy environment; we do not want to change policies every day. We understand very well that mining projects are long-term investments, so the predictability in the economy and the rules of the game is paramount. This is what we want to offer as a country. ■

> *We must ensure mining is used to develop other industries so that we do not remain dependent on a single sector. When we do eventually run out of ore, the economy should be diversified and robust enough to move on without mining.*

Nathan Mbikayi, Key Account Sales Manager,
Amotech Africa

> *The Zambian government recognizes the necessity for a stable business environment to facilitate increased copper production. This includes addressing infrastructure challenges, such as the need for additional electricity and plans for new hydropower and solar projects.*

Kris Jedrzejczyk, Managing Director,
Blu Rock Mining Services

<< 80

Spotlight on Zambia: How to mend a broken trust

The haze of high-flying multi-billion investments and highly ambitious plans can easily gloss over Zambia's current reality. The economy is growing at a modest 1.7% GDP this year, copper production is at its lowest in four years, and, while President Hakainde Hichilema (HH)'s reputation in the international arena is as good as it gets, his popularity at home is declining, with some questioning whether he will be able to secure a second term at the next 2026 elections. The President liked to remind Insaka delegates of where he started in 2021, providing a before-and-after picture following his election: an economy crippled by debt can now hope for a rebound at over 6% growth in 2025; mining companies that were trapped "in the court," an allusion to the KCM and Mopani stranded assets that left many without jobs, are now in full swing; and companies that were thinking of exiting Zambia have now pledged billions. However, locals might have a different view on things, frustrated with power blackouts for days at a time and soaring inflation.

It is fair to say HH inherited an economy on its knees in 2021 after the country defaulted on its Eurobond debt a year before. The road to that default was paved years back, as a result of both bad policies and bad luck. A serious drought in 2015 severely impacted Zambia's agricultural and industrial sectors, and the national utility company (Zesco) introduced energy rations with up to 12 hours/day of power outages. During the same 2015-2020 period, copper prices went through a downcycle. Those years also coincided with excessive regulatory instability that drove off investment and put some of the country's biggest mines on hold. The pandemic was the final straw bringing Zambia to the brink of economic collapse. By 2019, debt payments had become the country's largest spending category (30%), according to an analysis by Finance for Development Lab.

Sonny Zulu, managing director and CEO at Standard Chartered Bank Zambia, thinks Zambia has reached the end of its restructuring journey but it is not yet out of the woods, with the IMF expecting to close the program in June 2025. After that, Zambia can hope for an update from rating agencies. "Inflationary pressures as well as volatility in the exchange rate had created an environment of tighter monetary policy impacting the liquidity available. The number of loans has decreased either because borrowers cannot afford them or because lenders do not have the liquidity. The high cost of borrowing has hindered growth, however, on the upside, the number of NPLs (non-performing loans) has been stable. 2025 should see the approval of more loans, as the banking sector becomes more liquid once again," Zulu explained.

In 2024, Zambia - and HH's Presidency - is again tested by a draught, thought to be the worst in decades. Since most of Zambia's electricity comes from hydropower, the drought has deep implications on the entire economy, from food supply to industrial production. Zesco has asked miners this year to cut power use by 40% amid the supply crunch. According to Jason Kazilimani, the CEO of KPMG Zambia, the power deficit has overshadowed the entire economy: "The drought experienced this year did not only impact power availability but also agriculture, which has been very low, forcing Zambia to import more food products and therefore upset the trade balance. With the measures being put in place this year, we believe things will start improving in 2025 and moving forward. The official target for next year is 6.6% GDP growth. We view this as overly ambitious, though not completely impossible. The key point is that we have reached the bottom and the only way is up."

Natural calamities cannot be controlled, but policies can, and that can make the difference between past and present. Andrew Chibuye, senior partner at PwC Zambia, said the trust between the government and the mining sector was dramatically broken since 2008 with the introduction of the windfall tax, later reversed. The following period saw over 30 changes made to the mining code, from operations to fixed and variable tax rates, mineral tax, capital allowances, carry-forward of losses, separate source income tax, mineral royalties,

87 >>

Anthony Malenga

Country Manager (Zambia)
BARRICK LUMWANA

> *The US$2 billion Super Pit expansion at Lumwana will double our production froman average of 120,000 to 240,000 t/y by 2028.*

'Copper is as strategic as gold is precious' has become one of Barrick's recent taglines. How strategic is copper within Barrick Gold's portfolio and how is the US$2 billion expansion at Lumwana contributing to your copper strategy?

Barrick acquired the Lumwana asset in 2011 from Equinox, when the business was under a lot of stress. Following the Barrick-Randgold merger, the company refocussed its strategy to include copper. We have since announced major investments in copper including the expansion of the Lumwana copper mine in Zambia. The US$2 billion Super Pit expansion at Lumwana will double our production from an average of 120,000 to 240,000 t/y by 2028. Construction is due to begin next year and expect to extend the LOM by another 36 years.

Could you give us a sense of the socioeconomic impact of the Lumwana expansion and Barrick's broader CSR work?

Mining is the bedrock of Zambia's economy, accounting for 70% of Forex earnings and between 15 to 19% of GDP. Lumwana plays a direct role not only through revenue contributions to the state but also through employment opportunities and local procurement – currently, we have 3,000 direct employees and 2,500 contractors, and we expect the number to grow to around 8,000 during the construction phase. The expansion will significantly accelerate economic activity in the Kalumbila District, where we are essentially developing a town with housing for all our employees, as well as social and commercial additional amenities like an airstrip and industrial park.

Our CSR programs have been a big part of our work in the country for many years. Through the Lumwana Community Trust, we have contributed to the construction of hospitals, schools, road infrastructure and agriculture initiatives, in partnership with the three chiefdoms in our localities. In 2021, we went a step further and launched the Community Development Committee; some of our flagship projects under this program included improvements at a secondary school in Mayama, investing in a new police post, and supporting agriculture projects. A lot more is still to be done. Our NVEP (Nos Vies en Partage) Foundation is deeply invested in the countryside, partnering with orphanages and vulnerable people. One of the most recent partnerships via the NEVP was to partner with the Disaster Management & Mitigation Unit (DMMU) with a donation of US$50,000 to alleviate the impacts of the drought on food availability – 6 million Zambians are currently facing food shortages due to this historic drought.

How do you think Zambia fares in terms of investment attractiveness today?

Since taking office in 2021, President Hakainde Hichilema has made commitments to improve the investment climate, being a former businessman himself. His government has passed multiple reforms to stabilize the mineral royalty regime which used to be incredibly volatile. The government introduced duty waivers on mining equipment to encourage investment in the country. Very important is also the openness to dialogue, which the president and his cabinet show in a way that has not been done before. The mining industry shares a common goal with the government, and that is to ramp up copper production in the country to 3 million t by 2031. We think this is achievable with the current policies.

Power availability will be a big challenge. What is your take?

Power is one of the biggest challenges. However, Zambia is currently revising its energy policy to liberalize the sector, meaning that private operators can now supply power to the grid and to the main industries. Sometimes, challenges serve to push us towards opportunities and innovative solutions.

Do you have maybe a final message you'd like to share with our readers?

Zambia is a beautiful, extremely peaceful, and welcoming country, and I encourage everyone to come see it. Being able to have open dialog with the government has been extremely refreshing; we can solve issues faster and there are no separate or hidden agendas. As a business, we are very excited about the bullish copper projections as a metal of the future and Zambia's role in supplying the coveted red metal. ■

Anthony Mukutuma

Director - Zambia

FIRST QUANTUM MINERALS (FQM)

> *Our vision is closely linked to Zambia's vision: to bring the country's copper production to 3 million t/y by 2031.*

Could you provide an overview of FQM's assets in Zambia and the importance of the country to the company's overall business?

First Quantum started operations in Zambia in 1996 with a small, 10,000 t/y copper mine in Ndola. Today, we have two main businesses: Kansanshi PLC, which consists of our flagship 240-250,000 t/y Kansanshi mine, and FQM Trident, which includes the 250,000 t/y Sentinel copper mine and the Enterprise nickel mine, which started commercial production in June this year. Underpinned by our two copper mines in the country, Zambia is the largest contributor to FQM's total copper output, followed by our Cobre mine in Panama. Production at Kansanshi has been dropping over the past five years due to declining grades, but we announced a US$1.25 billionn expansion (S3 expansion) to increase production from the current 159,000 t/y today to over 200,000 t/y in 2026.

What does the Kansanshi S3 expansion entail and what has been the progress to date?

The S3 expansion will see the throughput of Kansanshi increase from 29 million t/y to over 55 million t/y by building a third pit. On the mining side, we are expanding the mining fleet significantly, with 36 new trucks as well as new dozers and excavators, while on the processing side we are adding a new open-pit crusher, feeding into a milling plant of one semi-autogenous mill and one bore mill going into the flotation plant. We are on track to be up and running by the end of the first half of 2025, with the first ore fed into the crusher in June-July of next year and ramping up through the remainder of 2025. The crusher and the two mills are already in place, the conveyor belts are being installed as we speak, and the mining fleet has been commissioned. Over the next six months, we will be busy with the electrics, control system, and instrumentation cabling, so the project is on schedule.

Could you highlight FQM's progress at the Enterprise nickel project and the role of nickel in FQM's diversification?

Enterprise is our third nickel project and the largest. We were granted by the Zambian government a large scale mining license for the development of Trident project (that included Enterprise). The construction of the Enterprise process plant was completed in 2016, but due to low nickel prices, the plant was not commissioned until 2023, with commercial production declared in June 2024. Enterprise sits adjacent to the Sentinel copper mine and presents the occurrence of a mineralized copper ore body on one side, and a nickel ore body on the other, which is rather unique in the world. This gave us the opportunity to build a nickel mine next to a running copper mine, leveraging on shared infrastructure and services to materially reduce operating costs. Even though nickel prices are currently under pressure, Enterprise is a very low-cost operation, making us competitive. Enterprise started this summer and has a guidance of 20,000-21,000 t for this year, which ramps up to just over 45,000 t/y in the next 1-2 years. The average production for the 10-12 years LOM will be 40,000 t/y, placing Enterprise at the top of the world's largest nickel mines.

What is your current exploration focus in Zambia?

We have two main focuses: One is close-to-site exploration around our operating mines at Kansanshi and Trident aimed at identifying LoM enhancement opportunities, particularly at Sentinel mine, and, second, we are looking at a completely unexplored areas in the north and northwest regions of Zambia. FQM completed an aerial survey of the old Zambian Copperbelt during the first quarter of this year. We are currently compiling data to put together an exploration model to identify areas of interest for further exploration. The results of this study will be handed over to the government of Zambia in February 2025.

How has FQM navigated the draught and ensuing energy crisis in Zambia?

To navigate the situation in the short-term, we imported power from the region, which drove our electricity costs from 9 to 14 cents/kW/hour. We also had to be proactive and take measures to secure long-term power supply, so we assembled a team to identify power generation opportunities within the country. The drought destroyed crops and ravaged Zambia's agriculture. At FQM, we found a way to help the government support food security by using copper export trucks to transport grains into the country on back hauls. ■

<< 84

withholding taxes, and so on. Some of these were introduced and then scrapped. These changes dried out the exploration sector.

Since 2021, the new government has sought to earn back the lost trust. Most notably, tax royalties are now recognized as tax-deductible, thus avoiding double taxation on both mineral royalty and income tax, while the duty applied for importing concentrates was removed, allowing companies processing facilities in the country to import from the DRC and process in Zambia. However, there are still areas of uncertainty. Excessive bureaucracy and administrative red tape are still rampant. For two years, the Mining Cadaster department was closed, without any new licenses issued over that period. When reopened, new licenses were awarded over existing ones causing chaos.

This issue of license encroachment has been among the most quoted in our interviews. Mike Chilufya, partner at Mulenga Mundashi Legal Practitioners, highlighted that the problem runs deeper: "The problem is that we do not have a tribunal in place to formally challenge the decisions made by the regulator, the Mining Cadastre. While the law states that you can have a tribunal, the personnel who constitute that tribunal are supposed to be appointed by the Minister of Mines and Mineral Development, yet in the three years of office, the Minister has not appointed anyone. As a result, the mining industry is questioning when and how the administration seeks to remedy the situation if the institution supposed to handle these disputes does not exist."

The main area of uncertainty stems from the replacement of the country's mining act, currently in the pipeline. Multiple changes over the years make the replacement of the Mines and Mineral Development Act (2015) necessary. However, a Minerals Regulation Commission Bill published right before the Insaka conference caused serious backlash from the mining industry. Minister of Mines Paul Kabuswe unveiled a strategy to establish an investment company that would control at least 30% of critical minerals production from future mines through a production-sharing mechanism. This would only impact new projects and not apply to existing license holders. This draft legislation was met with an almost visceral reaction from the Chamber of Mines, who called it "an unprecedented threat to investors" and a decision that was both "unaccountable and arbitrary."Zambia's President himself tackled the matter directly in his opening speech at Insaka, reiterating that the country is open to dialogue. However, mining lobbyists say that dialogue should have taken place prior to the Bill. It is unsure how long it will take to get to a new draft and make that into law. Until then, the 2015 Act, with its misgivings, remains in place.

Other question marks were raised earlier this year when the Bank of Zambia proposed a de-dollarization policy to make the Kwacha the sole legal tender for domestic transactions, in a bid to strengthen the currency. This was previously attempted in 2013, with disastrous consequences and the currency plummeting.

While recent regulatory changes have helped reposition Zambia in the eyes of investors, the country jumping up nine positions in the latest Fraser Survey, time is needed to heal old wounds and prove the country's long-term direction. The provision of tangible long-term guarantees, especially considering that Zambia's copper assets tend to be low-grade, high-tonnage, and with a long life, would be a good starting point to rebuild the broken trust. Having a pre-determined arrangement would allow investors to relax, knowing that the old days of inconsistent and sudden changes are over.

In the vein of not repeating past mistakes, a final point would be to highlight a contradiction in the government's mining strategy. Andrew Chibuye, senior partner, PwC Zambia, picked up on the paradox: "Zambia has been talking about mineral diversification for many decades now. Almost contradictorily, we also aim to boost the production of copper – the commodity we are singlehandedly most dependent on as an economy."

Though key to Zambia's GDP (13.74%), copper is also an Achille's hill for the country's economy, if there's anything that can be learned from the last downcycle. Diversification into other commodities to buffer future downturns would be wise. Currently, Zambia is a leading producer of emeralds, accounting for 70% of global emerald supply with players like local Grizzly Mining and UK-based Gemfields leading the way. Zambia also hosts Africa's largest nickel mine, Enterprise, opened this year by FQM, with a guidance of 20,000-21,000 t/y, to be ramped up to 45,000 t/y in the next 1-2 years. Uranium could also provide an opportunity for diversification. The only uranium company on Zambia's cadaster is GoviEx Uranium, developing the Muntanga project, with a recently acquired new license (Lundazi).

A 750,000 km2 country-wide airborne survey, contracted by the government with Xcalibur Smart Mapping, could also open the ground for other resources, and help the country move beyond copper, which was the theme of its first Insaka mining event.

Spotlight on the DRC: The siren's call of the eastern Congo

DRC's staggering mineral wealth and extraordinary discoveries make the it an irresistible mining frontier, despite numerous challenges. Nevermind that the DRC is one of the most corrupt countries in the world (ranking 162 out of 180 countries in Transparency International's Index), one of the worst places for ease of doing business (ranking 183 out of 190 countries according to the World Bank), or a hotbed for legal troubles, the latest scandal being Australian company AVZ halting trading this year after authorities withdrew its permit over conflicts between shareholders, including Chinese company Zijin Mining and local state-owned Cominiere. Nothing seems to deter investors.

The eastern part of the country, particularly the Kivu provinces, has been insecure for many years, leaving the area mostly in the hands of artisanal miners and militias. Recently, however, more players are moving into this part of the country. The major player in the east is Barrick Gold, operating Africa's largest gold mine. Kibali is in the Haut-Uélé province in northeastern DRC. This year, Barrick announced new discoveries at the AKT target, located 4 km away from Kibali's processing plant. Barrick's top executive Mark Bristow said the new target could deliver a multi-million-ounce orebody feeding into the continent's largest bullion operation.

While Haut-Uélé serves as a refugee sanctuary for those fleeing the eastern provinces of Ituri, North Kivu, and South Kivu, other companies are daring to venture closer to the epicenter of the war, moving into these redmarked regions. The UAE signed a US$1.9 billion deal with state-owned Société Aurifère du Kivu et du Maniema (Sakima) to develop at least four mines in eastern DRC, a region marked by intense violence, with over 120 active militia groups according to the United Nations.

Besides this direct state-to-state deal, private companies are forging partnerships with local artisanal and small-scale miners. According to the Delve Database, launched by the World Bank, up to 2 million people are directly dependent the artisanal and small-scale (ASM) mining in the country, and up to 10 million derive their livelihood from ASM. Half a million of these are in the troubled eastern DRC.

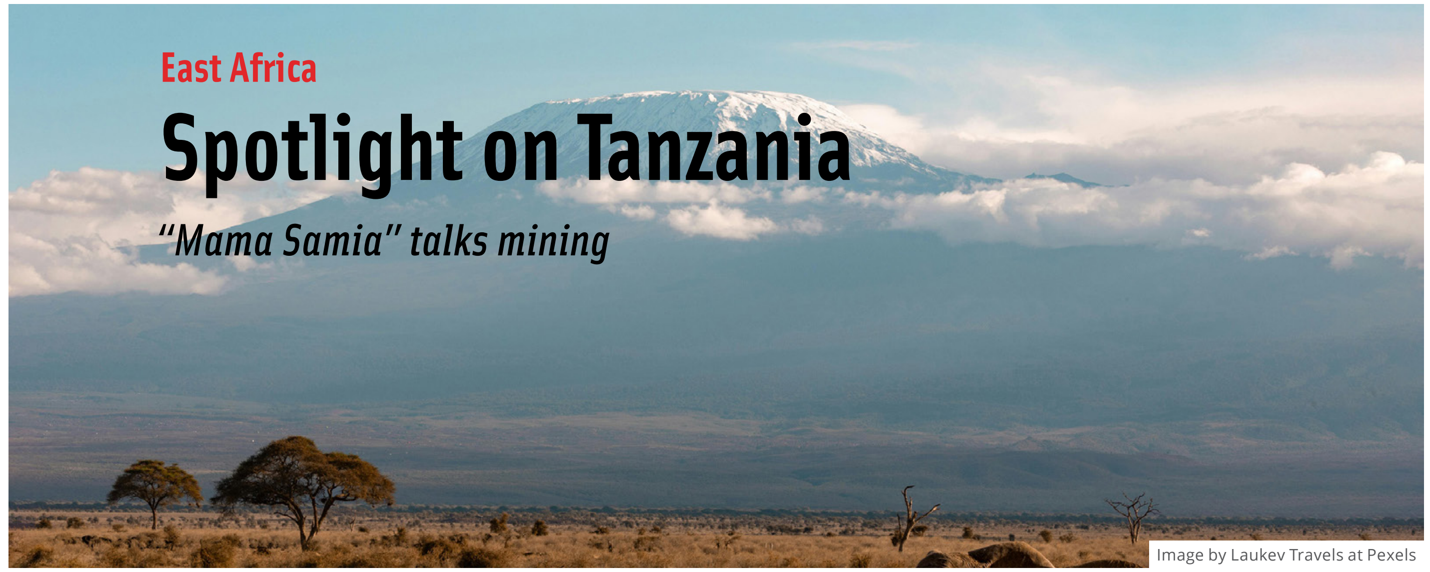
Vancouver-based Canada Rare Earth Corp announced this year the establishment of a rare earth supply operation in the DRC through its local subsidiary, Simba Essential Minerals. The minerals would be sourced from the Kivu provinces (North and South) through local mining cooperatives. The TSXV player is to invest in processing technology and equipment to increase efficiencies.

"Countless small communities across the globe sit atop untapped wealth, waiting for the right partner to unlock their generational prosperity. Our goal is to partner with cooperatives and local communities to scale the extraction of gold in a lawful, formalized way."

Jason Clarke, CEO, **Society Artisanal**

In the artisanal gold space, American company Society Artisanal was founded four years ago and has since worked on establishing a semi-industrial alluvial gold mining operation through a cooperative in South Kivu. The company was established by former NGO worker Jason Clarke, now Society Artisanal's CEO, who met former child soldier turned refugee, Evariste Emmanuel (Eva), a Congolese from South Kivu. Eva's family, whom he later reconnected with, was part of one of the largest gold cooperatives in the DRC. The two partners started looking for business opportunities that would also benefit the local community: "The Western perception of small-scale and artisanal mining from places like the Congo is associated with conflict minerals, 'blood diamonds' and other negative tropes, but at the bottom of it, there are millions of hard-working artisanal miners who are simply trying to make a living. While multiple NGOs and government agencies are engaging with artisanal mining communities to provide training, capacity building and certifications, we found a gap in actual sustainable businesses to enrich the livelihoods of the locals," said Clarke.

Operating under a 'Blue Status', Society Artisanal helps formalize the cooperative by ensuring conformity to local regulations (including the removal of mercury), bringing in equipment, and introducing new technologies like drones and surveys to better understand the presence of gold deposits. With equipment on its way, Society Artisanal wants to start building the South Kivu site in 2025, projecting to produce between 10 to 20 kg/month from the site. The investment for this program will range between US$3 and US$5 million. The company established a non-intervention agreement with the Mai Mai (community-based militia) groups present in the region. Clarke hopes to see the model replicated in other parts of the world, having already registered the company in Liberia and looking at the acquisition of a large site in Guinea. "For now, the focus is to prove it can be done in the DRC - if it can be done here, it can be done anywhere," said Clarke. ■



East Africa

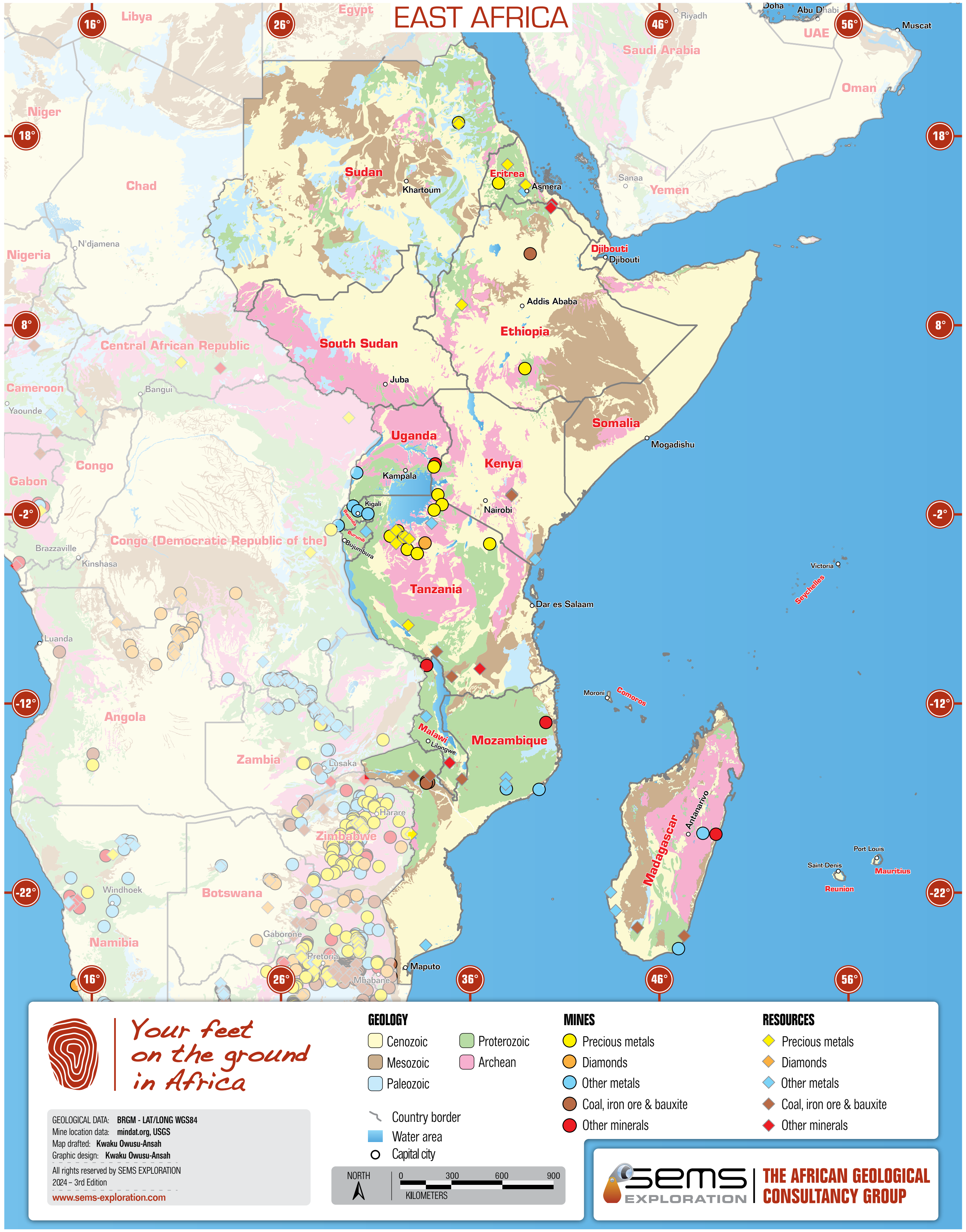
Spotlight on Tanzania

"Mama Samia" talks mining

Image by Laukev Travels at Pexels

Everybody has something nice to say about Tanzania's president, Samia Suluhu Hassan, affectionately called Mama Samia, 'mama' being a cultural honorific address for women in leadership positions. Hassan took power after the unexpected death of former president John Magufuli in 2021, just a year into his second term. Though Hassan was Magufuli's vice president, her governance has taken a completely different direction from that of her predecessor, who is remembered as 'the bulldozer' because of his forceful leadership style: The former President was a hard-liner on the industry, while his successor has taken a much softer approach.

This approach is working so far. The mining sector accounts for close to 10% of GDP, a contribution it has not reached in over a decade. Interestingly, a perception of underwhelming benefits from the mining industry was a particularly sore spot for Mr. Magufuli. Under his leadership, Tanzania banned the exports of unprocessed min-



> *Tanzania is a well-established mining jurisdiction that continues to rapidly improve under the Presidency of Samia Suluhu Hassan. The government has granted multiple framework agreements (akin to investment agreements) and special mining licenses, and adopted a much more collegiate and supportive approach to the mining sector.*
>
> Bardin Davis, CEO, **Peak Rare Earths**

eral ores, hiked royalty rates, and introduced government ownership of mining, measures which may have been acceptable had they not been delivered with an unusual hostility. In 2019, Magufuli accused Acacia Mining, acquired by Barrick, of swindling the government by under-declaring the value of exported minerals by billions of dollars. Barrick managed to negotiate an agreement by paying US$300 million in settlements, but the message was out: Tanzania's government is not afraid to take on even the big miners. Today, Barrick is the single largest contributor to Tanzania's economy, generating 51% of government revenue from the extractives industry.

Emerging from the shadows of Magufuli, President Samia Suluhu Hassan had been taken for no more than a figurehead, but in her almost four years as president, she has managed to restore Tanzania's tarnished reputation and repair both diplomatic and investment ties.

Hassan is Tanzania's first female president and also the first president from Zanzibar. Though many policies introduced by Magufuli remain in place, Hassan has managed to change the rhetoric and project an investor-friendly image of the country, so that the country's foreign investment has been increasing steadily in the last three years.

The main tangible changes under Mama Samia's leadership were democratic reforms, such as lifting the six-year ban on opposition rallies and loosening the grip on the media. However, critics have called her reforms too limited: For instance, some newspapers were banned from publishing their online editions after they ran an animation deemed critical of the president; she also appointed some of Magufuli's hardline supporters to high positions, and she postponed an already-long-delayed redraft of the constitution until after elections this year.

Nevertheless, the Tanzanian mining industry agree that Mama Samia has turned a new page for Tanzania. Chris Showalter, the CEO of Lifezone Metals, which operates the Kabanga nickel mines acquired in 2021, shared his thoughts: "President Hassan opened the doors to the international community, getting the story of Tanzania out. The fruits of her efforts are paying off, as exemplified by multiple recent investments. There is a nice buzz in Tanzania."

The return of BHP in the continent, 10 years after it had exited Africa, underscores that buzz. BHP invested US$100 million for 17% of the Kabanga asset as part of an earn-in agreement with Lifezone. Lifezone started producing first nickel, copper and cobalt from the project in 2024. There have also been multiple recent developments in the gold sector, the country's main mineral resource. This year, Perseus Mining, an Australian mid-tier with a portfolio of mines in West Africa, acquired OreCorp and its flagship Nyangaza gold project in Tanzania. Silvercorp had also made an offer for the asset. Perseus's managing director and CEO, Jeff Quartermaine, said: "We are not at all deterred by Tanzania's past. Our experience so far has been first-class, with meaningful support from the government. I believe the government and the people of Tanzania welcome Perseus' entry into the country, given our track record of working with diverse host communities and bringing three mines into production. They can clearly see Nyanzaga, which has been around for 20 years, finally being brought into production under Perseus' stewardship."

Perseus plans to make a final investment decision on Nyangaza by the end of 2024, with first gold estimated in 2027. Another company that has attracted enthusiastic bidders is Shanta Gold, approached last year by Shandong Gold, Chaarat Gold and Yintai Gold, but eventually sold to Saturn Resources (part of ETC Holdings). Shanta has two mines in production, together accounting for more than 100,000 oz/y. A new player is TRX Gold, which entered commercial production at the end of 2022 with a small, 1,000 t/d processing plant. According to the company's end-of-year results, the Canadian player produced 19,389 oz of gold in FY24 and plans a third plant expansion from the cash flow generated this year.

Tanzania's two largest gold producers, Barrick Gold (with the North Mara and Bulyanhulu mines), and Anglo Gold Ashanti (with the Geita mine) together account for close to 1 million oz/y gold, the bulk of Tanzania's total gold production. This year, Tanzania introduced a new law ordering gold producers to sell 20% of bullion to central banks, paid at market prices, a measure also seen in Ghana, Africa's leading producer. As Anglo celebrates Geita's 25th anniversary, the major restarted exploration in the country by setting up Greenfield Exploration Ltd, with an office in Dodoma, Tanzania's capital.

Apart from gold, Tanzania is well-positioned in the critical mineral supply chain, particularly in graphite, as the fifth largest holder of graphite reserves in the world. Multiple companies, all of them Australian, have signed framework agreements with the government for the advancement of graphite and rare earth projects. Among the most active is the Mahenge project of ASX-listed Black Rock Mining, which signed a US$179 million agreement with the Development Bank of South Africa (DBSA), the Industrial Development Corporation of South Africa (IDC), and Tanzanian bank CRDB, as well as a US$50 million financing with South Korean company POSCO. Other important graphite projects in Tanzania include the Chilalo graphite project developed by ASX-listed Evolution Energy, the Epanko graphite project of ASX peer EcoGraf, and the Bunyu graphite project owned by Volt Resources.

Tanzania also hosts one of the world's most advanced rare earth projects, Ngualla, according to owner Peak Rare Earths. The company has inked a term sheet with China's Shenghe Resources to finance the development of the project. "The Ngualla project has been de-risked from a technical, regulatory, offtake, and funding perspective. We are targeting to execute legally binding agreements with Shenghe that are consistent with our signed terms sheet shortly and deliver a final investment decision by the end of Q1 2025," said Bardin Davis, the CEO of Peak Rare Earths.

While these companies look ahead to a future as producers in Tanzania, others have managed to settle old issues stemming from the previous regime. TSXV-listed Winshear Gold ended a long dispute with the government following the expropriation of its license in 2019. The company received US$30 million in compensation. Perth-based Indiana Resources also won in an arbitration case against the Tanzanian government, receiving a US$109 million settlement in 2023 over its Ktaka Hill nickel project, ending a nine-year-long dispute. With these matters closed, both Tanzania and its former mining actors can put the past behind them. ■

"As traditional mining regions mature, mining companies are also venturing into new, underexplored, and sometimes riskier geographies. Africa is known to hold an abundance of minerals required for the energy transition, and that has caused a flurry in exploration for such deposits."

Mashudu Lembede, Mining Market Leader Africa, **Bureau Veritas**

East Africa

Spotlight on Rwanda

Transparent 3T trade

Image by Helene Jaspers

Rwanda is a small player in the African mining scene, mostly known for its 3T (tin, tantalum and tungsten). After the DRC, Rwanda is the largest tantalum producer in the world. Mining makes up only about 3% of Rwanda's GDP, but last year, the industry grew by a record 43%, according to the Rwanda Mines, Petroleum and Gas Board (RMB). Thanks to the increased demand profile of 3Ts, used in electronics applications, Rwanda is also attracting more international interest; it has recently signed an MoU with the European Union for cooperation on critical raw materials, and Rio Tinto has also launched a three-year mineral exploration campaign in partnership with the government.

At the same time, Rwanda's minerals are rather contested in the international arena. The US has issued a Statement of Concern on minerals coming via Rwanda and Uganda, but originating in Eastern DRC, which neighbors the two countries. The US fears these minerals are illegally mined and play a role in financing the conflict in Eastern Congo. The historical background of the conflict in the eastern DRC region is complex and increasingly intertwined with minerals. It started when the Rwandan Patriotic Front (RPF) invaded the then-called Zaire (DRC), targeting Hutu militant groups hiding in the country in the aftermath of the Rwandan genocide of the Tutsis (in 1994). A prominent rebel group, the March 23 Movement (known mostly as M23), formed primarily of ethnic Tutsis, emerged in Eastern Congo. After lying dormant for about a decade, M23 has resurged in recent years, purportedly backed by Rwanda and Uganda, something they both deny.

The DRC itself demanded an embargo on Rwandan "blood" minerals, especially after the M23 rebel group, controlling large swathes of the DRC, seized control of the Rubaya coltan-mining Congolese region. The UN estimates the armed group generates around US$300,000 a month from these mines.

In the land of a thousand hills, where the mining sector is mostly artisanal and small-scale, there is one large company: Trinity Metals, one of Rwanda's largest private employers, formed in 2022 by bringing together three of the country's historic mines – the Rutongo tin mine, Musha tin and tantalum mine, and Nyakabingo tungsten mine. In the two years since, Trinity increased production by 70% across all three assets, making the mines some of the largest in Africa. Rutongo is now Africa's second-largest tin producer; Musha is Rwanda's second-largest tin and tantalum mine; and Nyakabingo is Africa's biggest tungsten producer, said Peter Geleta, CEO of Trinity. Trinity has secured US$3.86 million in technical assistance funding from the US International Development Finance Corporation, which it will mostly spend on ESG initiatives.

Trinity is also considering an IPO once it has consolidated. Publicly listed producers would help further legitimize the 3Ts sector, however, it has not been a traditionally easy endeavor for 3T producers to go public, mostly because of the difficulty of ascertaining deposit size and grade. Omid Ameri, managing director of Woodcross Resources, a tin smelting business in the region, explained the nuances of this challenge: " We would certainly love to do an IPO, however, for a listing, we would probably need to show an advanced JORC or NI 43-101 resource with a development plan, whereas our business model is different. We plan to be a refiner and work with artisanal miners across the region. Unfortunately, this is not a properly understood model in the mining capital markets. As a former banker, I think that having cash flow is always better than having a very 'hot' asset in the ground, but we must educate the market first before going for an IPO. More than that, the geology of tin deposits, with very thin, narrow quartz veins (or pegmatites in some cases) makes them quite hard to intercept with drilling programs, so defining a substantial resource would be challenging. For this reason, more than half of the tin in the world is mined artisanally."

Woodcross is working with blockchain technology provider Minespider to demonstrate the provenance of the material and ensure transparency. Minespider's founder and CEO, Nathan Williams, explained how blockchain can help the mining sector prove legitimacy: "Our mission is to bring transparency into the supply chain of metals so that buyers and end users have confidence in knowing where these metals are coming from and under what conditions they have been produced. Though we are still at the beginning of our journey, we are tracking approximately 10% of the world's tin supply. (...) The more information is disclosed, the easier it becomes to differentiate from those 'bad actors' in the market; and the more data points you provide, attested by a third party, the more trust is built."

Besides the 3Ts, Rwanda has also started looking at its lithium prospectivity. Trinity discovered lithium on its Musha concession and hit high grades of spodumene pegmatite mineralization in its first drilling campaign. There is currently one lithium project explored in the country, developed by Aterian and backed by Rio Tinto in a recent earn-in deal. ■

Francis Kamanzi

CEO

RWANDA MINES, PETROLEUM AND GAS BOARD (RMB)

What is the RMB's mandate?

Rwanda Mines, Petroleum and Gas Board (RMB) is a government institution established in 2017 to oversee Rwanda's mineral, quarry, oil and gas resources.

What is the importance of the mining industry for Rwanda's economy?

Rwanda's national growth is greatly aided by mining, which supports industrial materials and manufacturing industries as well as infrastructural development by generating employment possibilities throughout the mineral value chain, which presently employs over 70,000 people. It is mandatory for all firms engaged in mining and quarry operations to engage in social corporate activities aimed at addressing the socioeconomic difficulties and reducing poverty that mining-host communities experience. Ever since 2019, the mining revenue sharing scheme has been operational whereby revenues accrued from mining are distributed to the districts hosting mining activities to put in place infrastructural development that benefit the communities.

Mining accounts for 3% of Rwanda's GDP. In 2023, Rwanda's mineral exports reached over US$1.1 billion, a 43% increase from US$772 million in 2022.

What a re recent developments in mineral exploration in Rwanda?

In 2023, Rwanda launched a three-year mineral exploration campaign, focusing initially on gold and lithium. The government formed a strategic partnership with Rio Tinto Minerals Development Limited to explore and develop lithium and other associated mineral deposits. Also, on February 19, 2024, Rwanda and the European Union signed a MoU to establish cooperation on sustainable value chains for critical raw materials.

Rwanda's mineral portfolio includes traditional minerals such as the 3Ts, gold and gemstones, and emerging ones like lithium, beryllium, and rare earth elements.

How is enhanced mineral processing and mineral value addition progressing?

The sector is transitioning from artisanal to large-scale/ industrial mining, with modern techniques and equipment boosting mineral recovery rates and productivity. At present, we have three state-of-the-art value-addition facilities. These include a gold refinery, a tin smelter and a tantalum refinery. ■

East Africa

Spotlight on Uganda

Overreaching or visionary?

Image by Fredrick Kimbugwe at Pexels

Like Rwanda, Uganda's mining sector is tiny, representing 2.2% of the country's GDP, according to the Uganda Bureau of Statistics. Sharing the eastern border with the DRC, a well-known geological hotspot, Uganda's best-selling point as a mining destination is its geological association with its neighbor. "Few are aware of Uganda's endowment. Yet, geology knows no political boundaries," said Themba Ntuli, the CEO of Kara Gold, a mineral trader and developer in the region.

But investors need more than attractiveness-by-affiliation to invest in exploring Uganda's geology. The country's recent regulations have not helped. In 2022, the country passed the Mining and Minerals Act, and a year later, the Mining and Minerals (Licencing) Regulations, which operationalized the Act. Based on the recently introduced regulation, the state can take an ownership interest of up to 35% in any large or medium-scale license, which includes a compulsory free carry of 15%. This year, the country set up a state-owned entity to manage the government's equity interest in mining operations. Uganda also has had a controversial ban on the exports of unprocessed ores in the hope of promoting in-country processing.

In October 2024, Uganda saw its first tin refinery in operation, by Woodcross Resources. The company, however, had different plans initially. "Shortly after acquiring the license about three years ago, the government banned the export of ores and concentrates to promote in-country value addition, which essentially meant that we could not monetize the mine we had just bought. The government's decision led us down a path of investing in a smelter to process tin locally," said Omid Omid Ameri, managing director of Woodcross Resources.

Woodcross is today an integrated mining and refining company with two mining licenses and a tin smelting facility in Southwest Uganda. The smelter is operational at 1,000 t/y of LME Grade A tin ingots. While continuing to grow the resource at its Ruhama mine (with a current JORC resource of approximately 40,000 t inferred), the company is positioning itself as a regional smelter for the East African markets, leveraging on the region's tin mineralization. Ameri estimates that between 2,000 to 3,000 t of tin is moved in the area. The regional feed would allow it to expand the refining capacity to 10,000 t/y.

Though Woodcross' success story suggests beneficiation is possible, there are important obstacles for the country going down a path of forcing local processing. First, the measure stifles exploration, since not many companies would take the risks of exploration without knowing if they can commercialize the minerals down the line. Also, there are structural obstacles, such as Uganda's energy capacity, which would not currently support large-scale, energy-intensive refining: "Uganda is well endowed with water and is a net positive producer of hydropower, with excess power exported to neighboring countries. However, beneficiation would consume far more power than the current uses of electricity in the country. Uganda is more of an agrarian than an industrial economy, so it will require additional capacity to support smelters and refineries," said Themba Ntuli, the CEO of Kara Gold.

Kara Gold started with a Ugandan tin mine 10 years ago but has since shifted direction in search of gold opportunities in the west of the country. The company made a gold discovery in 2018 and is currently raising money to advance the project. A part of the financing comes from its operations as a service provider and trader of Rwandan tin, which it sells into South Africa and the South Asian markets.

Uganda is mostly known for limestone, volcanic ash, iron ore and tin. While Kara Gold helps add gold to the basket, a mineral currently mostly mined at an artisanal level, Ionic Rare Earths has arguably been the promoter of Uganda's story, bringing attention to the country's REE potential. The Makuuku REE project, developed by the Australian junior, is believed to be a rare ionic clay deposit. Ionic received its mining license at the beginning of 2024, the first issuance of a large-scale mining permit in the country since the passing of the 2022 laws. Ionic is also looking at the possibility of a value-addition step to separate the mixed rare earth carbonate into 15 individual rare earth oxides – something that the government must have taken into consideration when awarding the license. The government also recently awarded Chinese-backed Sunbird Resources a license to mine limestone to produce cement in the country's northeast region.

Uganda is also trying to revive its only copper asset, the state-owned Kilembe mines, situated close to the border with the DRC, Africa's top copper producer. In 2023, Uganda received bids from multiple players to revitalize the mine, with no announcements since. Kilembe was mined between 1956 and 1982, but outdated equipment and low copper prices brought operations to a halt. In 2013, Chinese company Tibet Hima began its rehabilitation after winning a 25-year concession, but the government terminated the concession, wrote Dialogue Earth.

Uganda's mining policies can be seen as overly ambitious, considering the country's nascent and little-developed industry. Yet the few active players in the country prove that where there is a will, there is a way. ■

East Africa

Spotlight on Ethiopia

Gold, everywhere

Image by WitR at Adobe Stock

"I do not exaggerate when I say there is gold everywhere." These are not the words of an enthusiastic geologist selling the story of his junior company but belong to Peter Marrone, the founder of Yamana Gold, a company sold in 2023 for US$4.8 billion. Marrone is refering to the outcroppings seen at the Kurmuk gold project in Ethiopia, a top-tier asset in the portfolio of Allied Gold Corp – the company created by the former Yamana management. "We took Yamana from roughly 84,000 oz/y in 2003 to over 1 million oz/y when we sold it in 2023. With Allied, we are starting from a much bigger platform placing us on a path to creating a high-quality, high-octane, high-returns growth company," Marrone told GBR.

Allied Gold Corp has a current production platform of around 344,000 oz/y from its assets in West Africa, but with the expansion of the Sadiola mine in Mali (acquired from IAMGOLD and Anglo Gold Ashanti), and the development of Kurmuk in Ethiopia, the mid-tier producer is positioned to reach 600,000 oz/y by 2026 and 800,000 oz/y by 2029. Kurmuk, with an inventory of 3.6 million oz, will contribute about 250-300,000 oz/y towards that guidance.

"The foreign exchange reform is a major step towards opening the Ethiopian economy, along with the recent agreements with the IMF and the World Bank. Since these announcements, I have had calls with several international suppliers who are suddenly interested in the country."

Jørgen Evjen,
CEO, **Akobo Minerals**

"Ethiopia offers a relatively straightforward licensing process with clear guidelines for selecting exploration areas. Our projects in Africa, located in Sudan and Ethiopia, are in the Arabian-Nubian Shield, a geologically rich but underexplored region with significant potential for high-grade discoveries."

Christopher Schmidt,
CEO, **ANS Exploration**

Allied Gold is already the largest mining player in Ethiopia and a poster child not only for the country but for the geological structure known as the Arabian Nubian Shield (ANS), straddling Saudi Arabia, Egypt, Eritrea, Sudan and Ethiopia. Saudi, in particular, has been a major marketer of the area, popularizing the concept of a mineral 'Super Region,' which consists of Africa, the Middle East, Central Asia and South Asia. Speaking on the advantages of Ethiopia within the ANS, Marrone emphasized that the country's mineralization is exposed, with extensive outcroppings, unlike in Saudi where minerals are covered by a layer of sand, making exploration more difficult.

That is not to say there are no challenges. Jørgen Evjen, the CEO of now-producing Akobo Minerals, knows that best. Akobo has been working in the country for about 15 years, developing a small mining operation in the vicinity of the Akobo river, close to the South Sudanese border – a remote, never-mined-before area. In 2019, it made an extraordinarily high-grade discovery, Segele, with a grade of 40.6 g/t in indicated resources. Akobo has since entered production and is preparing for its first shipment. Commenting on the milestone, Evjen said: "It was certainly not easy to get to where we are. Last year we were facing one of the most extreme weather conditions ever recorded in Ethiopia, with rain pouring down throughout summer just as we were trying to lay concrete and cement for our foundations. Since our site is in a remote location, a two-day drive from Addis Ababa all the way to the border with South Sudan, we needed to import pretty much everything, which was challenging in the context of a stressed economy where imports were halted. The government has been understanding, and we were eventually able to overcome these operational issues, but all of this has taken time, delaying the project."

Though not traditionally a mining country, Ethiopia recognizes the sector as a key pillar of its economic growth and aims to see the industry expand by 33% annually. The country's recent reforms, including floating the birr currency, are helping to liberalize its economy and attract more investment. Evjen has received many calls from international suppliers suddenly interested in the country: "I hope this will not only draw in more international investors but also help with the day-to-day operations, like paying suppliers, having offshore accounts, or paying dividends. As you know, the first question we get asked from investors is, *'How will I get money out from Ethiopia.'*

The reform is bold, but painful for the local population in the short term. The birr lost 90% of its value less than 10 days after the birr was floated.

Other explorers active in Ethiopia are positioned with a diversified portfolio across the ANS belts. Named after the geological structure it targets, ANS Exploration, a private Canadian company, has projects in Sudan, Ethiopia, and most recently, Saudi Arabia. London-listed Kefi Gold and Copper is focused on both gold and copper exploration on the ANS, developing the Tulu Kapi gold project in Ethiopia and a second project in Saudi. Vancouver-based East Africa Metals has three gold and precious polymetallic mining licenses in Ethiopia and two gold licenses in Tanzania. If successful, these companies could open the stage for Ethiopia to be known not only for its gold but also for copper and other metals. ■

Peter Geleta

Chief Executive Officer
TRINITY METALS

Could you introduce Trinity Metals to our audience?

Trinity Metals was established in May 2022, bringing together three historic Rwandan mines: Rutongo tin mine, Musha tin and tantalum mine, and Nyakabingo tungsten mine, all located within a 45 km radius of Kigali. These mines, which date back to the Belgian colonial era, had operated independently and changed ownership multiple times over the years. The mission was to resurrect the mines and build a professional international mining company.

Could you walk us through the progress made in the last two years to revitalize these mines?

We began by establishing robust management systems with proper governance and leadership structures, while also injecting US$35 million into the business. The results have been remarkable: we have increased production by 70% across all three assets, transforming them into cash-positive operations with significant growth potential. For example, when we took over, Rutongo was producing 11 t of tin cassiterite per month; now, it's up to 90 t. Musha's production has increased from 11 to 35 t of tin per month, and Nyakabingo has boosted its tungsten output from 29 to 100 t per month. At current production rates, Rutongo is now Rwanda's largest and Africa's second-largest tin producer; Musha ranks as Rwanda's second-largest, while Nyakabingo is the continent's top tungsten producer, contributing 8% of the world's tungsten supply. Our next step is to establish a qualified reserve and resource statement to demonstrate the long-term potential and valuation of these assets, which we aim to complete by the end of the year. Currently, we are mining only 20% of our concession under a 25-year lease on all three mines, leaving the remaining 80% relatively underexplored. We're mostly still mining the tunnels originally developed by the Belgians, which means there is ample opportunity to expand beyond them. We are now opening virgin ground at all three mines, developing declines at depth, which could potentially double our capacity over the next five years. ■

Omid Ameri

Managing Director
WOODCROSS RESOURCES

Could you introduce Woodcross Resources?

Woodcross is an integrated tin mining and refining company with two mining licenses and a tin smelting facility in Southwest Uganda. Shortly after acquiring our first mining license in FY2021, Uganda banned the export of ores and concentrates in a bid to promote in-country value addition in the mineral sector. The government's decision motivated us to establish Uganda's first ever tin smelter and re-establish Uganda's export corridor for tin. We completed the feasibility study and investment requirements by January 2023 and were producing LME Grade Tin Ingots by October 2023. Today, we are fully operational with a capacity to produce up to 1,000 t/y of refined tin. In December 2023, the government of Uganda passed legislation allowing for the export of LME grade tin, which essentially granted Woodcross with the exclusive right to export tin out of Uganda.

Can you tell us more about the Ugandan mining industry?

The mining industry here in Uganda is still in its infancy phase, despite the country's promising geological landscape. The ban on export of unprocessed minerals has historically driven some investors away from Uganda, though the government has been extremely supportive to investors and mining companies that incorporate value addition into their business plans. I would say that in a country with a strong beneficiation mandate, you really need to localize yourself and discover the potential for exploration and development of mining assets, which has been an overlooked venture historically.

What is your outlook on the tin market?

Tin is a mandatory input into the manufacturing of all electronic devices. The advent of disruptive technologies such as AI and machine learning, data centers and networks, solar panels and other renewable energy applications means we are going to need a lot of tin. The world is now waking up to the fact that there is no viable scenario where the supply side of the tin market can keep up with demand, if the referenced disruptive technologies are widely implemented on a global scale. ■

Chris Showalter

CEO
LIFEZONE METALS

Could you introduce Lifezone Metals to our international audience?

We have two flagship projects, the Kabanga nickel project in Tanzania, in partnership with BHP, and a recycling project in the US, in partnership with Glencore. Our proprietary hydrometallurgical processing technology eliminates the smelting phase from the refining process, helping the mining industry meet CO2 reduction targets, as smelting accounts for up to 80% of the overall emissions. We are now in the commercialization phase, rolling out our know-how with two of the top five largest mining groups in the world.

What attracted Lifezone to the Kabanga nickel project in Tanzania?

We have a strong competitive advantage because we are able to unlock domestic beneficiation. Domestic beneficiation is an incredibly powerful value proposition for many host governments.

Tanzania has made huge commitments to infrastructure investments. These developments have allowed us to access rail from our refinery location, and to access grid power which was recently brought to the Kabanga site.

How has Tanzania transformed under the presidency of Samia Suluhu Hassan?

President Hassan is the first female and first Zanzibarian President in the Country's history; she opened the doors to the international community, getting the story of Tanzania out. The fruits of her efforts are paying off, as exemplified by multiple recent investments, including the US$30 billion LNG project by a consortium led by Shell or the return of BHP for that matter. There is a nice buzz in Tanzania.

Is the automotive industry ready to pay a green premium?

Battery manufacturers and car manufacturers may not want to take Indonesian nickel but they do not have an alternative. However, if you look at Tesla's annual report, about 33% of the CO_2 associated with a Tesla vehicle is attributable to the nickel in the battery cathode. By using our Hydromet Technology at Kabanga we can provide nickel with ultra-low levels of CO_2 emissions. ■

AR

GM

Ashim Roy and Gianluca Maina

AR: VP Operations
GM: Global Marketing & Communications Director
FURA GEMS

Could you introduce Fura Gems?

AR: In 2017, we spun out of Gemfields to create Fura Gems. Today, we have three operations: an emerald mine in Colombia, a ruby mine in Mozambique, and a sapphire mine in Australia. In Mozambique, we have 11 licenses over a 54 km2 tenure. Our resource is established from just three licenses with a total LOM of 30 years and with immense upside potential.

Do you see a greater interest and scrutiny over the sustainability and traceability of colored gemstones in the end-markets?

GM: We are currently undergoing RJC (Responsible Jewelry Council) certification for all our mines, which aligns with our broader efforts to enhance mine-to-market visibility.

Since our foundation, we have collaborated with Provenance Proof, a blockchain technology, to ensure traceability from the mine of origin. We envision a future where such details become an industry standard, enabling customers to receive a comprehensive provenance proof certificate filled with ESG-related data alongside their gemstones.

What is the current demand for gemstones in 2024-2025?

GM: Our Mozambican rubies are particularly sought after for their rich color, reminiscent of Burmese rubies. However, unlike Burmese rubies, which are often associated with controversy regarding their source, our rubies come from a more desirable and responsibly managed origin.

Could you tell our readers about the operational environment in Mozambique?

AR: 10 years ago, when I first came to Mozambique, the biggest challenge was the lack of skilled manpower. However, today 95% of our workers are nationals of Mozambique, and the rest of 5% are expats that remain highly engaged in skill transfer programs – we even opened technical schools for training in both Mozambique and Colombia.

Do you have a final message?

AR: Fura Gems is continuously raising the bar on sustainability measures as we strive to be a responsible, ethical, and innovative industry leader. ■

A penny for a thought

CEOs comment on the operational environment in different African jurisdictions

Guinea

"There are multiple successful gold exploration companies in Guinea. Despite the military-led administration, there are currently no conflicts or threats of violence such as one may see in other West African countries. Guinea is the place to be in the Birimian right now."

Greg Isenor, President and CEO, **Alma Gold**

Ghana

"Ghana is Africa's largest gold producer and the sixth largest globally. Ghana is keen to see projects built and is a pro-development country. At Newcore, we are fortunate to have amassed such a large land package in a top-tier gold mining jurisdiction."

Luke Alexander, President and CEO, **Newcore Gold**

Zambia

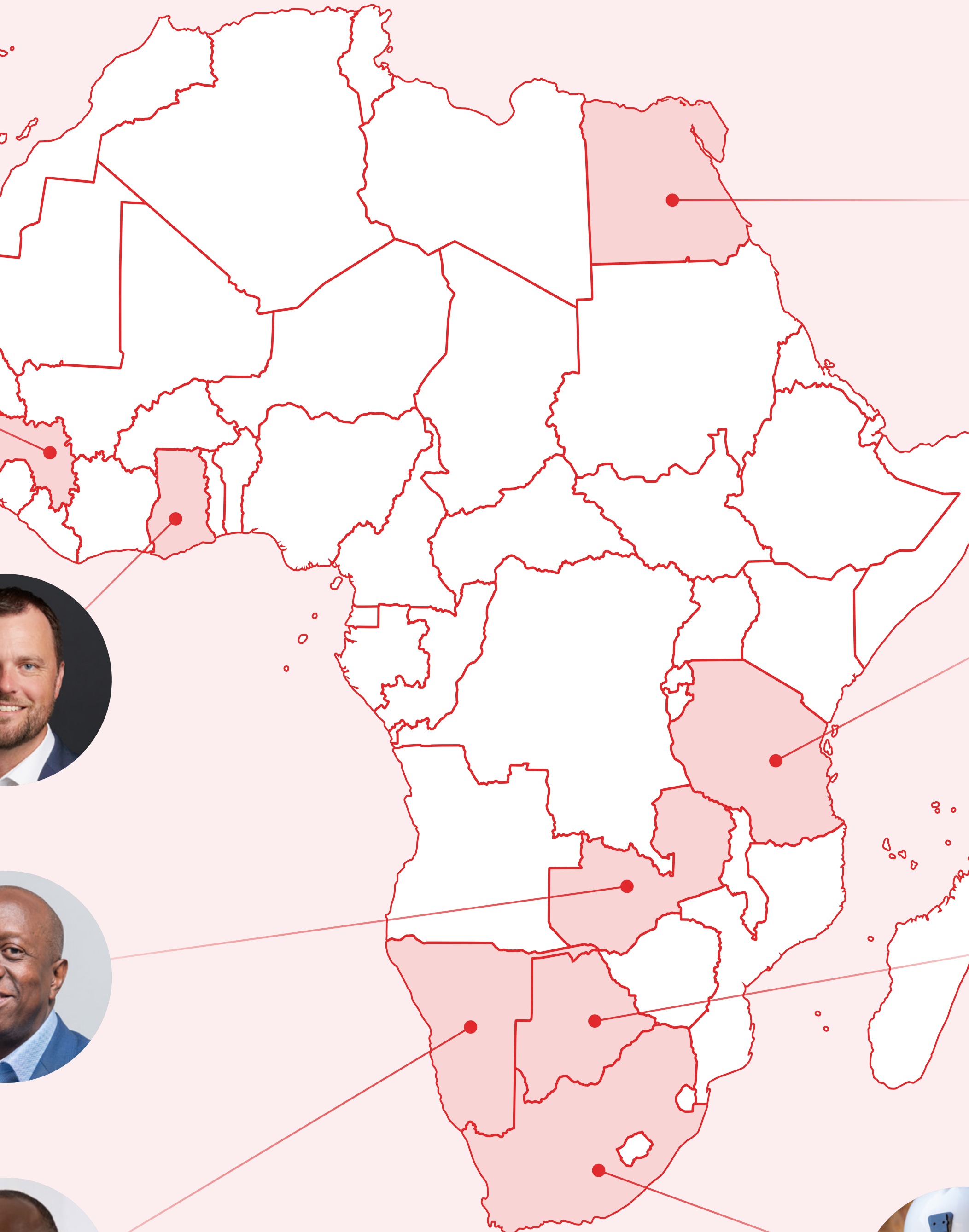
"We are pleased that in the past 3 years we have come to see more stability in Zambia. Our vision is not only to be a Zambian mining champion, but also to act as a local partner to both foreign and local investors."

Jordan Soko, Founder & Executive Chairman, **Mimosa Resources**

Namibia

"Namibia offers rule of law, stability, infrastructure and a skilled workforce—qualities that deserve more investor attention. While Zambia and the DRC have long been the focus for copper, Namibia and Botswana's copper belts remain under appreciated."

John Sisay, CEO, **Consolidated Copper Corp (CCC)**



Egypt

"The geology in Egypt is untested, yet highly prospective, with significant gold occurrences throughout the belt. Only a few companies have been lucky enough to secure licenses, and of those, we have some of the most prospective in the country."

Al Fabbro, CEO, **Red Sea Resources**

Tanzania

"President Hassan has turned a new page for Tanzania. She opened the doors to the international community, getting the story of Tanzania out. The return of BHP in Africa, specifically in Tanzania, is a strong endorsement of Tanzania and a credit to its government, but also to the quality of the Kabanga mineralization."

Chris Showalter, CEO, **Lifezone Metals**

Botswana

"Botswana is ranked at the top of the Fraser Institute in Africa for a reason. We received both the environmental authorization and the mining license within 9 months since submittal, when it takes a lot longer in most other parts of the world."

Charles FitzRoy, CEO, **Giyani Metals**

South Africa

"Our experience in South Africa is positive and is certainly better than what the global image seems to be. It can be challenging and lengthy to obtain permits, but we had a collaborative engagement with all the necessary government departments, and we did not face any hindrances in terms of financing institutions wanting to work with us."

Tozama Kulati Siwisa, Executive Director, **West Wits Mining**

SUPPLY CHAIN

"The mining industry is approaching a significant generational gap, with the current workforce holding a wealth of knowledge and experience nearing retirement, and a new generation of young people who are not keenly attracted to mining careers. Any new technology must consider the profile of future users, and their expertise and eagerness to engage with it."

Eduardo Coloma, CEO,
MAPTEK

Image by Endeavour

The Supply Chain

Beyond pit-to-port development

"The history of the continent is characterized by insufficient additive development from mineral resources," said Marcus Courage, the CEO of consulting firm Africa Practice, summarizing the premise of our following article.

It does not take an economist to see the paradoxes in the continent's trade patterns: Africa is exporting raw materials, only to re-import them processed as finished goods. Without sufficient in-country local skills development, Africa is exporting jobs while unemployment in the world's second most populous continent is on the rise. Furthermore, Africa is unfairly importing the impacts of climate change, even though its CO2 emissions are the smallest in the world.

Though mining is core to many economies in the continent and has served as a central catalyst to infrastructure development, the industry's impact on economic development has been underwhelming. Mining has triggered so-called pit-to-port infrastructure development, a model that lacks value-addition and the development of adjacent manufacturing industries. Africa's share of global manufacturing is only 1.9%, at the bottom of the global value chain, according to the African Development Bank. Manufactured goods represent 18.5% of exports but 62% of imports, said the same source. Though the continent represents 18% of the global population, Africa's total exports of goods and services account for less than 3% of all global trade. Rather than industrializing, Africa has undergone a process of de-industrialization, with limited progress in value addition, according to a paper by the Policy Center for the New South. Sub-Saharan Africa's manufacturing value add expanded by 2.8% annually between 2010 and 2022, lower than in the rest of the world, while its resource dependency has remained highest, with rents from natural resources accounting for about 8% of GDP, twice as much as in Latin America, the same paper found.

The discussion is nothing new, but the stakes are higher today in the context of the energy transition. In the words of Marcus Courage, CEO of Africa Practice: "The world cannot decarbonize without Africa." Not only are Africa's critical minerals of higher value and significance to the world today, but also the repercussions of climate change are more dire. Both factors heighten the risk of following a path of exporting raw materials crucial for the rest of the world while neglecting the continent's needs.

Africa is the most vulnerable continent to climate change and extreme weather caused by climate change. According to Afreximbank's Trade Report (2024), the continent is the world's most vulnerable to draughts and second most vulnerable to flood events. Temperatures are rising faster in Africa than anywhere else in the world, and the ability of governments to respond

> *Africa used to represent a small portion of our revenue, but over the past three years, we have nearly tripled our business here. We see Africa as a key growth region with great potential in the global mining industry.*
>
> Víctor Morales Baeza, VP EMEA Mining, **Orica**

to crises and climate shocks is more limited due to high levels of debt. While carrying the highest burden, Africa accounts for just 3.89% of GHG emissions – by contrast, the US accounts for 14%. On a per capita basis, the average American accounts for more than 10 times more GHG than the average African, noted the bank. The World Meteorological Organization estimates that up to 118 million extremely poor people in Africa will be exposed to draughts, floods and extreme heat unless measures are implemented. This will exacerbate poverty in the world's already poorest continent.

More African governments want to leverage their sovereign reserves of green energy materials like cobalt, copper, lithium, PGMs, REEs, 3Ts, nickel, graphite, iron ore, manganese, phosphates, chromium and silicon by introducing restrictions on exporting them unprocessed. Such measures, sometimes going to the extreme in the form of complete bans, may seem to come almost too late if we reflect on the history of under-industrialization in the continent. But they are, in fact, coming in too early. It is still premature for Africa to force beneficiation without first developing downstream capabilities, including sufficient power, skills and infrastructure. And, of course, beneficiation also hinges on foreign investment, which is encumbered by export restrictions, rendering such restrictions completely counter-productive. More than that, export restrictions, introduced so far by countries including South Africa, Namibia, Zimbabwe, Mozambique and Botswana, have repercussions on global supply issues, trade relationships, and relationships with existing investors. In-country beneficiation is therefore left stuck in a too-late-but-too-early conundrum.

Spotlight on local content: Ubuntu

'Ubuntu' describes a philosophy of interconnectedness between individuals and their surrounding worlds, which could translate as "I am because we are," as explained by Vishal Haripersad, managing director of engineering firm Knight Piésold for Southern Africa: "This approach emphasizes collaboration and a shared responsibility to leave a lasting, positive impact on the continent for future generations. It influences not only what we do as a business

> *Historically, engineering design has relied on the ability to predict future conditions based on past events. However, climate change introduces uncertainty into those predictions. We must now build climate-resilient structures that are safe not only today but also in an unpredictable future.*
>
> Vishal Haripersad, Managing Director, Southern Africa, **Knight Piésold**

but also how we do it. While projects eventually come to an end, the real legacy lies in the training, development and skills transfer they leave behind. This enables local workforces to replicate the work, empowering communities and strengthening local expertise," he completed.

Local content policies, which ask investors to hire and procure goods and services locally, have been the shortest route to creating value in the continent. Nine out of 10 resource-rich countries in Africa have introduced such policies, according to the Business and Financial Times. "This is the continent with the fastest population growth in the world. By 2050, one in four people will be African and we are not creating enough employment opportunities to cater to this growing workforce," commented Marcus Courage, the CEO of Africa Practice, who sees inclusive development as the best protection against resource nationalism, rather than a conduit to it.

The introduction of local content laws has paid off in countries like Ghana, which is no longer dependent on foreign labor and has a sought-after workforce of its own. With Ghanaians working at mines in other parts of Africa now, we can say Ghana is no longer importing talent, but also exporting it. Simon Meadows Smith, managing director at Ghanaian-based services firm SEMS Exploration, reflected on the change observed: "Traditionally, SEMS was seen as a project management group for foreign companies investing in West Africa. However, the West African market is evolving and maturing. There is now a large, experienced workforce in the sub-region (both expatriate and local) that has the necessary skills and experience to run field operations themselves. SEMS has therefore focused on providing technical services that our customers may not have in-house, such as topographic and geophysical drone services, which is a great area of growth for us."

Both Ghana and South Africa, the two most mature mining jurisdictions in the continent, have a well-established base of contractors and suppliers. However, while Ghana is home to mostly local SME champions, South Africa is indisputably a talent force on the global stage and the place of origin for many now-global companies like engineering firm Knight Piésold, established in South Africa in 1921, or global drilling technology company Master Drilling, founded in 1986 and present today in some 30 countries around the world.

Other companies born in the continent are also making the leap to the international arena. Capital, a driller born out of Tanzania 20 years ago, is already a well-known name working with the top tiers in the continent and has recently expanded outside of Africa, with contracts in the US and Pakistan. Smaller firms, most of them made in South Africa, are also seeing international success. METC Engineering, an EPCM company out of Johannesburg, has recently taken on work in Saudi Arabia, Poland and Spain, and it is partnering with a company in Brazil to bid for EPCM services in Latin America. Another South African engineering firm, Resultant Consulting, which specializes in structural engineering, has won the Engineer Excellence Award at the Steel Awards 2024 for its work on Barrick's Pueblo Viejo stockpile feed conveyor project in the Dominican Republic.

In other parts of Africa, where the local market is not as developed, local content requirements are more difficult to meet. Sometimes there is a gap between the regulations on local content and the tax policies in place, which could mean that it is easier and cheaper to import goods than to try to purchase these locally. Other times, the talent prescribed to be local is simply not equipped to the demands of the job or is non-existent, or indigenous firms struggle to get the financing in place to be able to bid for larger contracts. "Each government dictates the local workforce minimum quota, which is easier to meet in countries like Tanzania or Ghana with a history of successful mining, but not in the more frontier markets without an established mining workforce. Government requirements often do not match the reality of the ability to meet those demands," said Nichole McCulloch, managing director of Stratum International, a recruitment firm specialized in mining.

When local content laws are not in check with the realities on the ground, they can turn into just another motive for rent-seeking behavior from authorities or lead to the rise of on-paper JV partners for the sake of compliance alone. GBR spoke to Reuben Joseph, president for Africa and APAC, at EPCM Australian company Ausenco, about how the company approaches local content requirements. According to Joseph, the most important aspect is making sure local content requirements are not treated as a box-ticking exercise: "The unintended side effect of local content policies can be foreign companies meeting their quotas without any meaningful impact on skills transfer or lasting partnerships. At Ausenco, we take a good look at how our partners can complement our skill set in a genuine, impactful way. There should be a lasting legacy from the partnership while still delivering a project that is best in class and meets the high standards our clients expect from Ausenco. For instance, as part of our work at the Nachu graphite project in Tanzania, we teamed up with a local engineering firm who could assist in delivery but also brought valuable skills and local knowledge. We can only add real value to a project by combining skills, helping knowledge transfer, and supporting the long-term growth of local businesses. This is what local content requirements were intended for."

Service providers in the continent are doing their part to make sure they leave behind a positive legacy. Capital, a drilling company, does so by engaging closely with host communities. For instance, it is now building a football stadium in Kouroussa, Guinea, where the local football team it supports did them proud by winning the country's Club Championship. Caterpillar West African distributor, Neemba, is developing the Neemba Academy in Côte d'Ivoire and runs multiple programs for skills building, with 700 technicians currently enrolled in such certification programs.

The impetus for Africa to develop its own strong talent pool is strong. First, population growth means more people are coming of working age and need to be absorbed by the local economies. It is a sad contradiction that countries like South Africa have both one of the highest unemployment rates among youth and a talent crisis in the mining sector. According to Mzila Mthenjane, the CEO of the Mineral Council of South Africa, the mismatch is explained by the lack of economic growth being outpaced by population growth. Another critical factor is the education system, which he says is not equipping young people adequately with basic skills.

The other challenge has global roots: the mining industry is nearing a talent crisis, and this will hurt Africa the most. Nichole McCulloch, managing director at Stratum International, a recruitment firm, explained: "Africa is one of the more challenging markets for talent. Africa has an aging workforce. The people working in the deepest parts of Africa are starting to retire, and the younger generations are not filling those gaps as readily because they come with different expectations. They pay more attention to the work-life balance, not wishing to spend weeks at a time on site in a relatively secluded location; they are more values-driven than money-driven; they are politically aware and tend to oppose working in countries with a human rights abuse record. This creates a huge problem in terms of the industry's ability to attract talent. It is much easier for larger companies to suck up top-tier talent, to the detriment of the more junior companies. Crucially, it is these smaller companies that require that talent to get their projects off the ground... Talent is the biggest risk facing the mining industry."

Moreover, the demands of the industry are also changing, with new technologies like AI gaining traction, and the industry getting pulled closer to other industries like car manufacturing and new minerals gaining prominence. According to McCulloch: "Sometimes we get calls from clients asking for candidates with extensive lithium experience, but realistically, there is hardly anyone out there who has extensive lithium experience since this is a developing market."

Besides continuing to develop existing local talent, African countries and the African mining industry need to also do a better job promoting mining as a career to avoid future skills shortages. ■

Insights from engineering and consultancy firms

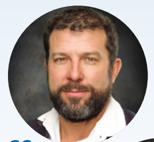
Pick your Expert

"We have developed smart tools and fully exploit the value of AI, incorporating these to address global challenges like climate risk, renewable energy and tailings management besides others. Our flexible approach to applying industry standards is essential for our success."

Vis Reddy, Chairman, South Africa & Regional Coordinator (Africa), **SRK Global**

"We pair our engineering smarts with an in-house financial modelling team, allowing us to tailor the project. For example, a US$2 billion project might maximize NPV but is not so easily financed. We align with our client's financial drivers and feed that back into our decision-making process; this can mean designing a 10 million t/y plant to start as a modular, scalable, and more easily fundable 5 million t/y plant. Our clients are increasingly interested in this approach."

Reuben Joseph, President, Africa and APAC, **Ausenco**


CC


IW

CC: "Resultant has become known as the go-to for unique structural engineering problems. We have grown particularly good in dynamic structures like crushers, screening plants, or any equipment where you are applying dynamic loads."

IW: "Aging assets represent an important growth space for us. Many African mines have been operating for 15-20 years and are reaching a point where they require critical maintenance, so we help them work out the critical aspects they need to attend to first."

Christo Croeser (CC), Director and Engineer & Izak van der Wat (IW), Director and Engineer, **Resultant Consulting Engineers (RESCE)**

"There is a lot of trust in Lycopodium to deliver consistent outcomes in terms of engineering, design, and project delivery, especially in isolated and challenging geographic locations. Our clients choose us because of our track record and world-class expertise."

Karl Cicanese, Managing Director, **Lycopodium Minerals (APAC)**

"METC is an EPCM professional engineering services provider specializing in the design and construction of metallurgical plants. We thrive in countries and jurisdictions that are embracing their mining potential but are not yet fully mature in terms of local mining-related services."

Nick Tatalias, Managing Director, **METC Engineering**

Consulting Adds 'Critical Mass' to Inspire Mining Innovation

Andrew van Zyl
Managing Director,
SRK CONSULTING (SOUTH AFRICA)

> *Collaboration is by far the more productive scenario for forging positive momentum, whether for iterative improvements or quantum leaps of discovery.*

A mine is a challenging environment for on-site managers, professionals and technicians, who face daunting new challenges annually – not least of which relate to complex and evolving sustainability issues that are often not part of their training in traditional disciplines.

The mining sector has committed to decarbonise, for instance, as well as to manage scarce water resources, nurture the local economy, and engage constructively with communities and other stakeholders. Each of these demands impacts on the mine's executives and practitioners in different ways, requiring complex analysis and extensive engagement with peers when it comes to developing and executing solutions – peers who are often not based on the mine.

This is not the most conducive way of innovating effective strategies – irrespective of the context. We need only look at China's exponential improvement in mining, technology, transport and manufacturing in recent decades to understand the full power of critical mass, where many professionals are able to feed off each other to unravel tricky challenges. Collaboration is by far the more productive scenario for forging positive momentum, whether for iterative improvements or quantum leaps of discovery.

In contrast, many on-site practitioners find themselves with few locally-based experts in fields such as environmental, social, sustainability and some more niche technical disciplines. Add to this the daily pressure of operations, and the result can be a poor environment for creative progress.

It is in this space that we as consulting engineers and scientists have been reminded how privileged we are to work daily among peers who share a similar focus, interest and an obsession with solutions. Not only can we draw on colleagues' varied experience to unpick a project's complex challenges, but we can more easily engage other disciplines to gain insights we may never have considered.

While many of our clients may not be so fortunate in their on-site environment, this capability is increasingly an advantage we can bring to them – not just as an end-result or solution, but as a supportive team of multiple experts in a mutual process that may last months or even years, allowing us to provide insights but also contribute to institutional memory.

Another factor that adds substantial value in our working relationships with clients is our experience of different settings, climates, conditions and mining regions. While a mine practitioner may change jobs a few times in a career, our consultants immerse themselves in dozens of projects – exposing them to a range of novel problems and potential solutions that can be applied or adapted elsewhere.

A consulting firm ideally brings together a critical mass of professionals in key areas, enabling us to grow knowledge. This is possible because we engage often with experts in similar and related fields; our water stewardship specialists, for instance, will talk regularly to geotechnical engineers, hydrologists, hydrogeologists or tailings practitioners.

In a field like disaster management, to use another example, we may have four or five specialists that work together as they develop appropriate strategies for varying circumstances and to develop solutions for consultants in other fields. Their exposure to multiple locations, conditions, disciplines and challenges builds their expertise in very constructive ways – enhancing the value that they can add to their clients' projects.

It is worth restating that our clients on mine sites are experts in their own right, and many are highly experienced professionals at the forefront of their field. What the consulting profession brings is complementary to the client's more operational role and their deep experience with a specific site, for example, how their discipline can align with the ambitious sustainability goals set by the sector.

It is difficult to overestimate the build-up of challenges over recent years – from operating under global pandemic conditions, challenging economic conditions, power interruptions and dealing with climate change impacts, to complying with the Global Industry Standard on Tailings Management (GISTM) and pushing forward various social transformation goals. The decarbonisation theme, with all its promise, is also bringing considerable uncertainty in how the mining equipment landscape will evolve and how mining operations will need to adapt.

In all these future-facing endeavours, consulting engineers and scientists have become vital contributors to innovation, complementing our clients' expertise with our special brand of experience and enthusiasm. With today's unpredictable shifts in the market, regulatory landscapes and stakeholder expectations, we expect to be able to continue to make a valuable contribution. ■

Read previous GBR interviews with SRK

Building Better Boards: Essentials for Good Corporate Governance

Nichole McCulloch
Managing Director,
STRATUM INTERNATIONAL

> *In an industry where the challenges are as vast as the opportunities, getting board composition right is not just a matter of compliance—it is a strategic necessity.*

Corporate governance in the mining industry is crucial for maintaining ethical standards, operational efficiency and long-term sustainability. A fundamental aspect of ensuring sound governance is the composition of the board of directors. The right mix of expertise, experience and diversity on the board can play a pivotal role in guiding a mining company towards success while navigating complex regulatory environments, mitigating risks and addressing social and environmental challenges. Having the right people is not just about compliance, but about fostering a culture of accountability and trust that supports responsible decision-making and strategic vision that starts at the top.

Ethical Leadership

Corporate governance goes beyond the bottom line; it involves acting ethically and with social responsibility and purpose. Mining companies often operate in areas that are home to indigenous populations and vulnerable communities, making it essential for the board to prioritise sustainability initiatives. A diverse and knowledgeable board is more likely to consider the social, environmental and economic impact of mining operations on local communities, which is increasingly important to stakeholders and investors.

Ethical leadership on the board also involves transparency and honesty in communications with shareholders, employees, regulators and the public. The board must ensure that the company maintains the highest standards of integrity, particularly when it comes to issues like corruption, bribery and human rights. Effective governance in this regard requires a board that is not only focused on financial performance but is also committed to the principles of fairness and ethical conduct.

Independence and Objectivity

Board independence is a critical component of strong corporate governance. In an industry like mining, where the risks are high and regulatory scrutiny is intense, the presence of independent directors can enhance transparency and accountability. Independent directors are more likely to act in the best interests of the company rather than prioritising personal or executive agendas, which makes them well-positioned to hold management accountable for decisions regarding capital allocation, risk management and sustainability initiatives.

In addition, the independence of directors fosters greater credibility in the eyes of investors, regulators and the public - all of whom increasingly demand that mining companies demonstrate a commitment to ethical and responsible practices.

Finally, to maintain optimal objectivity on the board, it is essential that board members are rotated off regularly and that external and independent search processes are run to replace them.

Expertise and Industry Knowledge

Historically, one of the primary considerations when selecting board members for a mining company was their level of expertise and knowledge of the industry. The mining sector is highly specialised and complex, involving large-scale operations, substantial capital investments and intricate supply chains. The board must therefore be equipped with individuals who understand the technical, financial, regulatory and environmental aspects of the industry.

This specific experience can offer valuable insights into the challenges and opportunities within the sector, such as commodity price fluctuations, geopolitical risks and technological advancements. Furthermore, they bring a deep understanding of operational processes, safety regulations and labour relations, which are crucial for maintaining effective governance. Whilst this is still relevant, it is essential the board is not made up only of technical mining professionals and represents other industries allowing for critical thinking and innovation.

Risk Management and Long-Term Strategy

Effective governance requires board members to be able to assess operational risks - including safety concerns, environmental impacts and geopolitical factors - whilst simultaneously guiding the company in adopting a long-term strategy that balances profitability with sustainability. Stakeholders in the mining space increasingly determine that this long-term view must involve setting clear goals around environmental stewardship, community relations and workforce development.

Conclusion

It is difficult to understate the importance of constructing a board that is set up to deliver and maintain good corporate governance. In an industry where the challenges are as vast as the opportunities, getting board composition right is not just a matter of compliance—it is a strategic necessity. ■

Read latest GBR interview with Stratum International

Spotlight on Logistics

Transformational investments

African logistics is a cause of frustration for mining operators in the continent. There are frustrations over days' long trips over patchy roads to mining sites and frustrations over knowing your equipment or consumables may get stuck at customs, causing delays on top of already lengthy journeys. For logistics operators in the continent, most of their services are, by default, 'complex logistics.' By focusing on the gaps in African logistics, one may miss the progress made and the investments that promise more progress yet to be made.

For as long as there has been mining in a particular African country, the industry has been pivotal in driving infrastructure investments with impacts beyond a specific project and with uses beyond mining. As discussed at the beginning of this article, mining has been a catalyst of pit-to-port (and rail-to-port) investment, especially in countries like South Africa. Transportation infrastructure, accelerated in Africa during colonial times, has transformed the continent's economic geography, and, looking at current infrastructure projects underway, continues to do so. Three current trends in transport infrastructure investment demonstrate how they connect to Africa's mining sector: The emergence of mining-motivated transboundary projects, connecting multiple countries and bringing together multiple financiers, such as Simandou in Guinea or the Lobito Corridor between Angola, the DRC, and Zambia; More countries are taking an 'infrastructure-first' approach, building capabilities in anticipation of demand as opposed to letting demand dictate new investment, and finally, financing sources are getting more diversified and complex, breaking away from the predominant model of Chinese sovereign loans.

On the first trend, it is important to establish what makes a meaningful infrastructure project. Miners have regularly built roads and bridges to access mining sites, and these facilities were equally used by surrounding communities. But in special cases, and for the right kind of asset, large mining houses have played a much bigger role in building massive infrastructure like rail and port, to unlock the value of their asset. For years now, we have offered the example of Simandou, the world's largest known reserve of high-grade iron ore, found in the Simandou mountain range in southeast Guinea, to illustrate how a lack of infrastructure and political agreement have left such a valuable resource stuck for more than two decades since Rio Tinto first obtained the exploration license for the project. We will now use Simandou as a case study of dramatic transformation for Guinea.

> *"Our clients essentially outsource their entire logistics department to us as a main contractor, and then we tender for multiple subcontractors, meaning we are never in competition with anyone else. Our expertise is immediate, we know where to find the right people and the right deals in Africa."*
>
> Capt. Pappu Sastry, CEO,
> **Adhira Shipping and Logistics (ASL)**

After decades of negotiations, a consortium of investors led by Rio Tinto has pledged US$20 billion -close to Guinea's current annual GDP - into the development of the Simandou project, including adding 600 km of railway lines with 25% spare capacity for non-mining activities, as well as new port facilities. The iron mine, set to start production in late 2025, will be the largest in the world, operating at 120 million t/y of mined ore. The impacts on the country's economy are huge: Real GDP would be 26% higher with Simandou by 2030, according to an article by the Center of Global Development. The same source noted that up to 60,000 people will be employed during construction.

Commenting on the impacts beyond mining, Marcus Courage, the CEO of Africa Practice, said: "The Simandou iron ore project in Guinea is referential for creating multi-purpose infrastructure that is useful beyond mining, supporting agriculture and digital access, as well as helping communities make use of the infrastructure route. I believe the actors involved in the design of this framework have been very intentional in this sense, and we must credit the Guinean administration for managing to bring together players from across the world (both the Chinese, Winning International Group of Singapore and Rio Tinto) in a consortium to finance a project of such magnitude in a country that had a history of political instability and a high-risk credit rating."

This brings us to the second trend we noted: the diversity of financing sources involved in large, linchpin projects like Simandou. Traditionally, China has been the foremost source of infrastructure investment in the continent, funneling billions into the continent as part of its infamous Belt and Road Initiative (BRI). Although China remains Africa's largest trading partner and its biggest investor, the relationship has somewhat changed. First, the route of Chinese money is more complex. The Economist argued that China's lending has fallen, but trade has increased, which means Beijing continues to cast a wide net on Africa's mineral supply chains but is using different financing instruments as opposed to the

> *"The main challenge for mines in Africa is the lack of local sourcing. Lacking or inadequate infrastructure at ports and limited shipping capacity pose serious challenges in securing consistent and reliable supply to remote sites."*
>
> Gavin Erasmus, VP, Global Sector Head – Mining,
> **DHL Global Forwarding**

2000s-2010s typical sovereign loans. These new forms of financing include loans denominated in yuan as opposed to dollars, emergency-rescue lending to central banks, and packages involving multilateral banks, both Chinese and Western. Simandou, for instance, is financed by an international consortium consisting of Rio Tinto and China Baowu Steel Group Corp, along with other Chinese entities.

Second, China is increasingly more focused on what Xi Jinping calls "small but beautiful" projects, such as a US$50 million solar farm in Burkina Faso, though it does not mean it has stopped playing with billions too. Most recently, China provided US$1 billion for the Kaduna-to-Kano railway in Nigeria, according to Reuters.

However, China is not the sole party getting involved in financing large infrastructure projects in Africa, with Western investors and African development finance institutions (DFIs) playing a growing role too. Lobito brings in an array of investors, including the European Commission, the African Development Bank, and the US through the International Development Finance Corporation (DFC). Other DFIs have joined, like the African Finance Corporation (AFC) and the Development Bank of South Africa (DBSA). °

The growing interest of both East and West parties in infrastructure projects is directly connected to their interest in securing critical resources, arguably more important today than ever before. "It is very clear from current estimates that the world will require more copper, cobalt, lithium, rare earths, graphite and nickel, and more players will come to Africa to find these critical minerals. This makes it necessary to continue investing in logistics capacity across all major existing corridors, in truck, rail, warehouses and ports," said Amaury Luyckx, the CEO of Polytra Group, a logistics service provider.

Africa's logistics capacity is also constrained by current geopolitical issues within the continent, including insecurity at the Suez Canal, forcing ships to detour around the continent. The removal of Burkina Faso, Mali and Niger from the ECOWAS group also posits challenges to getting transports in and out of the three landlocked West African countries.

However, a range of infrastructure developments across the continent promise to ease the flow of goods and people and make room for future demand. Ethiopia has embarked on building Africa's largest airport, to be completed by 2029, in an investment worth at least US$6 billion. Rwanda is also building a US$2 billion airport, majority-owned by Qatar Airways. According to the African Airlines Association Air Transport Outlook (2024), African airlines experienced robust growth in passenger demand in 2024, signaling strong post-pandemic recovery. Building on the momentum of African Continental Free Trade Area (AfCFTA), more African countries relaxed visa restrictions, spurring more intra-African and international travel.

On the port side, new terminals are being built in Angola, Benin, Cameroon, the DRC, Ghana and Côte d'Ivoire, according to In On Africa (IOA), a research and analysis consultancy in South Africa. On the east side of the continent, the Port of Durban in South Africa stands among the most efficient, and the Port of Sar es Salaam in Tanzania has recently been concessioned by DP World, which will become its operator and has promised modernization. Out of the 100 ports and harbors on the circa 26,000-km-long African coastline, none ranks among the top 10 in the world in terms of container traffic, according to the World Bank. The African Finance Corporation (AFC) also found that, despite an estimated US$15 billion in investments made in African ports in the last 20 years, logistical supply chain efficiency has not been majorly improved, although capacity has increased by about 50% between 2011 and 2021. The reason why increased capacity has not resulted in better connectivity is the lack of complementary road and rail corridors. There are only 680,000 km of paved roads in Africa: Africa covers 20% of the world's land mass, but its paved roads only account for 1.5% of the world's total network, as found in the AFC's "State of Africa's Infrastructure" 2024 report.

In railway, Africa does no better, with a small and fragmented rail network of just 87,000 km, most of which is concentrated in Northern and Southern Africa. Important rail developments include the US$5.6 billion Standard-Gauge railway in Tanzania, the biggest infrastructure project that the country has embarked on, towards which the African Development Bank has lent US$1.2 billion announced in December 2024; the Kano-to-Maradi railway in Nigeria, supported by Chinese investors, the African Development Bank and the Development Bank of South Africa; and the 1,500 km Trans-Kalahari Railway, on the cards since 2010 but with construction reported to take off in 2025, connecting Botswana (and its mining industry) with Namibia's Walvis Bay port. And, of course, the Lobito Corridor, a flagship project and potentially the first child of a new model of infrastructure-led US development in Africa. The rail project is slated to break ground in 2026.

Such logistics mega-projects, bringing improved trade routes, both west and eastbound, along with capacity expansions at the ports, help facilitate the development of mining mega-projects in an infrastructure-first approach. However, as Simandou proves, it is sometimes the other way around, with mega-mining projects triggering down mega-investments in infrastructure. ■

Spotlight on Energy

Reaching a solstice

Image by Crossboundary Energy

Power, in the sense of energy, is power, in many senses: economic cost-competitiveness and geopolitical. By this principle, Africa is very weak, with one of the lowest per capita electricity consumptions in the world and with 43% of its population lacking access to electricity. While a green source like hydropower makes mines like Kipushi, a zinc asset operated by Ivanhoe Mines in the DRC, one of the cleanest in the world (with the lowest GHG emission/t of zinc produced), power outages have, at the same time, led to production cuts by the Canadian company along with others in the country last year. Similarly, in Zambia, a crunch in electricity production due to a severe drought has led mining operators to seek out alternatives like importing energy from South Africa's national utility company, Eskom. On its end, Eskom relies mostly on coal to produce electricity, which raises another dilemma for miners and the country itself.

Power generation has been traditionally confined to national utility companies like Eskom in South Africa or Zesco in Zambia. Energy is also traded via regional power pools, including the Southern African Power Pool (SAPP), the West African Power Pool (WAPP), and the Eastern African Power Pool (EAPP). Since state-owned utility companies have been unable to invest sufficiently in new generation, transmission and grid connectivity to keep up with demand, multiple governments have started to liberalize the sector and allow for independent power providers (IPPs) to establish both on-grid (via a built, own and operate or BOO model through which the electricity is sold to the national company) and off-grid power generation facilities.

South Africa's Electricity Regulation Amendment Act, announced in 2022 and set into law in 2024, is transforming the energy sector from one dominated by Eskom into a competitive open market. Shirley Webber, head of natural resources & energy at Absa Bank, thinks South Africa has been ahead of other African countries in allowing IPPs to establish power plants close to mining sites and enable direct purchases independent of the national grid, and that the relaxation of these regulations will flow over to the rest of Africa, particularly in those countries that belong to regional power pools. Zambia is already following in the steps of South Africa. Webber's colleague, Mizinga Melu, the managing director and CEO of Absa Zambia, said the Zambian government stipulated up to 25% of energy must be obtained outside the boundaries of the country or from alternative sources.

> *Africa is ideal for the implementation of solar energy, being hailed the 'sun continent' for it basks in sunshine stronger than all other regions. The challenge we see in Africa is grid connectivity, which is why we provide both on-grid and off-grid application solutions.*
>
> Abdennour Yahi,
> Technical & Marketing Manager, **JA Solar**

Out of all energy sources, solar energy is the most relevant in the 'sun continent,' with Africa receiving more hours of brilliant sunshine than any other continent. Between 2000 and 2022, Africa's electricity production increased by 103%, according to the IEA. Utility-scale solar and small-scale solar energy investment became the highest form of energy investment in Africa in 2023, when half of the countries in the continent added more solar than any other technology, as found by Bloomberg in its latest Africa Power Transition Factbook 2024. 260 large, utility-scale ongoing or upcoming projects are currently found in the continent, wrote ABiQ Solutions, a business intelligence firm out of Dubai; most of these are in Southern Africa.

Besides the availability of sunshine and the liberalization of the markets, there are two more factors that have led to the increased popularity of solar in Africa: One is the rise of battery energy storage systems (BESS), which provides a solution to intermittency; and the other is the drop in the costs of solar facilities and BESS. According to David Wilson, the CEO of Energy Exemplar, an energy modeling and simulation technology provider, solar plus storage has become the cheapest form of new-build energy (in non-subsidized markets): "The sheer level of cost reduction in the renewable energy and storage sector has reached a point that few would have predicted – and it continues to come down. This is revolutionary. Solar energy is much more flexible and can be tailored to the energy needs at a specific location, serving to democratize energy access even down to the household level and allowing users to become energy independent."

Renewable energy company CrossBoundary Energy has been working with multiple mines in the continent: a 13.9 MWp solar plant for Caledonia Mining's Blanket gold mine in Zimbabwe, where the operator had been struggling with unreliable power supply impacting production; a hybrid (thermal, solar and battery) solution for FG Gold's Baomahun gold mine in Sierra Leone; and a hybrid (solar, wind, and battery) solution for Rio Tinto's ilmenite QMM operations in Madagascar, which had been relying on a 21-MW HFO generator fleet. Aggreko, a leader in fit-for-purpose power solutions, provides both in-and-out, ad-hoc, and small-scale solutions for temporary needs, as well as longer-term PPA solutions between three to 15 years.

Other energy players are offering solutions to supplement the power pools: Solarcentury, a British company, has become a full operating member of the Southern African Power Pool (SAPP), accessing transmission borders with 12 countries. The company is also investing in its own solar site at Gerus, in Namibia: "We have no offtaker, no PPA, and no contract in place, and we are building this from our own balance sheet to sell power into the SAPP markets to stimulate trading and to also encourage others to bring more power in. There are approximately 600 million people in Africa without access to electricity – the more robust the power system becomes, the more we can make power affordable," said Jason De Carteret, the CEO of Solarcentury Africa. ■

Insights from energy suppliers

The Power Bid

"With an in-house 10 GW fleet quickly deployable anywhere in the world, Aggreko has become an indispensable partner for fit-for-purpose power solutions. We also now provide cleaner fuel options, helping our customers to improve their ESG parameters."

Johan Helberg, Head of Mining, AMEA (Africa, Middle East, and Asia), **Aggreko**

"Instead of installing their own solar project, mining companies would often be better off wheeling power through the grid and tap into power sources directly from our merchant sites – we are building several of these sites, two in Namibia, one in Zambia and more planned."

Jason De Carteret, CEO, **Solarcentury Africa**

"Over the past five years we have evolved into a total power solution provider, combining solar with thermal generation or other sources to ensure baseload consistency. Our current project portfolio includes circa US$570 million across circa 20 African countries, with 330 MW of solar and wind assets and 178 MW of battery energy storage."

Franck Alloghe, Business Development Director, Mining, **CrossBoundary Energy**

"Leveraging Shell's superior energy products and the strengths of the Vitol group, we developed an innovative one-stop shop decarbonization service which we call 'The African Mines Decarbonization Initiative' (AMDI). AMDI is a collaboration whereby efficient and low-carbon energy systems are co-developed, co-financed, and continuously optimized over the life of the mine to significantly reduce CO_2 emissions, reduce the energy operating expenses of the mine, and ensure high reliability of fuel supply."

Alex Caldwell, Head of Mining, **Vivo Energy**

"VoltVision started by helping companies redesign their electrical networks to accept renewables and realized that many operations do not fully understand their power profile. Understanding where every KW is coming from, where it is going, and what it is doing is the first step towards making electrical systems as efficient as possible. Our solution delivers this."

Manoli Yannaghas, Co-Founder and Managing Director, **VoltVision**

"Indeni was originally established as a refinery during a turbulent period in Zambia's history. For the past two years, Indeni has repositioned itself as a bulk procurer, exporter, and distributor of finished petroleum products. Our vision is to diversify into jet fuel, LPG, and petrol—essentially replicating the product portfolio we managed as a refinery."

Evans Mauta, CEO, **Indeni Energy**

Spotlight on Innovation

10 Trends (with examples)

Image by Wenco

Data as a service

The cloud-based service model known as data as a service (DaaS), which leverages cloud computing to digitalize and analyze data, is one of the fastest-growing sub-markets in the mining technology space. According to consultancy IndustryARC, the digital mining market is estimated to grow at a CAGR of 12.6% between 2024-2030.

*For example, Seequent's Leapfrog Geo 3D modeling software helps customers integrate, communicate and interpret geological data using 3D modeling. Seequent partnered with the Kenyan Geological Authority (KGA) to digitize and visualize extensive historical data using the Oasis Montaj geophysical processing platform to uncover details regarding mineral resources, groundwater availability, and geothermal potential so that the KGA could create an updated, detailed inventory of the entire country's natural resources. "Attracting investment is a major priority for African countries, both at the governmental and private levels. Seequent's software solutions allow customers to better communicate their project data to a wide array of stakeholders, facilitating more informed investment decisions and resource monetization," said Seth Miah, regional manager at Seequent West Africa.

AI evolution, not revolution

The generative powers of AI using easy tools, available to anyone, is one of the most salient advancements in the world of AI; although new uses of AI have an open-ended field of possibilities, AI is not new to mining, and its implementation in everything from autonomous vehicles to ore sorting, risk optimizations, or predictive maintenance has been a key area of innovation, especially in the last decade. AI is believed to be one of the most revolutionary technological breakthroughs in history, but, just as with other big innovations, it is a constantly and rapidly evolving space. On one end are the innovators; tech companies in different domains, playing with the applications of AI and advancing its capabilities; on the other is the rest of the world, grappling with the implications of AI. In October 2024, France appointed its first AI minister, for instance. In mining, equipment and technology suppliers bring to the market the latest AI-enhanced and AI-led innovations, in progressive steps, with each generation of equipment introducing new or improved features.

*For example, vertical roller milling technology provider Loesche has developed an AI-based mill control system and machine surveillance software that allows maintenance managers, production managers and process en-

"The mining industry is moving towards digital transformation and some major companies are looking at extremely advanced mechanization and control systems, but I believe it is more of an evolution than a revolution, and it will take time for the industry to integrate these advanced technologies."

Spencer Eckstein, Chief Operating Officer, **Ukwazi**

gineers to run equipment more efficiently. According to Christian Gerhard, managing director of Loesche South Africa, the mill control system leads to 5% lower energy consumption and 5% higher throughput, while the machine surveillance software gives a guaranteed six months' notice for maintenance planning. "The system has proven itself several times to exceed expectations, providing more than a year's notification on parts that would fail and cause collateral damage. In this way, our customers have the visibility to order replacement parts when the system notifies them rather than keeping large inventories," said Gerhard.

Back to basics

With AI penetrating most technologies pertaining to mining, the drivers behind these innovations remain unchanged: the basic principles of safety and costs continue to dictate the adoption of the newest and most sophisticated technologies.

*For example, minerals processing equipment supplier FLSmidth highlights its LoadIQ mill scanning technology, filtration technology and comminution technologies, all of which promise cost reductions through lower energy consumption and higher throughputs. Torsa, a Spanish company specializing in collision avoidance systems and in-cabin measurement suites, has developed a predictive algorithm that predicts risks – such as a machine overpassing a speed limit while traveling downhill on ramps – to operators of haul trucks, auxiliary and light vehicles, and thus avoid collisions. Targeting fatigue management, Wenco, a Vancouver-headquartered mining technology provider, has developed a fatigue solution called SmartCap, which measures a person's ability to resist sleep. According to Glen Trainor, VP of commercial, Wenco International Mining Systems, 65% of haul truck accidents in the mining space are related to operator fatigue.

Sustainability, a bonus

Sustainability is a third core driver for innovation, but still as a bonus advantage pegged to cost savings, rather than on its own.

*For example, dry stack tailings solutions, which are the most sustainable alternative to store filtered tailings, have yet to take off in Africa. TAKRAF, a global material handling equipment supplier, has completed a study on the application of its DELKOR dry tailings solution at a South African mine but has not done an installation of the system in the continent yet. "Sustainable water management, together with safety, are increasingly important topics for mining operations, investors and all stakeholders around the world, but right now, these issues must move from a 'talking' phase into concrete action," said Richard Späth, managing director, at TAKRAF South Africa.

Local support

The African market, which is vast and heterogeneous, has traditionally been a distributor market for tech suppliers. It is difficult for most brands to establish a local presence, especially in countries that represent a small portion of their sales, so they tend to rely on partnerships with local dealers for different markets. Contradictorily, African markets also particularly appreciate – and increasingly seek out - direct relationships with and support from the OEMs. As a result, we note a growing trend of even small suppliers setting up shop in the continent.

*For example, SciAps, a provider of handheld analytical instruments, established a South African office two years ago to support the region. "We had been operating through distributors for several years but that did not allow us to listen directly to what our customers want and need, so we changed our marketing strategy quite dramatically, setting up support and calibration centers locally to be closer to our customers," said Chris Manning, regional sales director for SciAps Africa.

Other tech companies interviewed by GBR, like Wenco, have also talked about a greater desire for partnerships with vendors from their mining clients, who want to ensure higher returns on investments and benefit more from the direct expertise of the tech experts themselves.

Open platforms

Aligned with the trend of closer vendor-customer relationships is the need for closer collaboration not only between technology providers and their customers but also between different teams within the same organization that operate from multiple sites. This is realized through interoperable platforms, IoT and remote functionalities.

*For example, Seequent, a provider of subsurface earthmodeling, analysis, data management and collaboration software, brings to the market tools like Seequent Central, which integrates multidisciplinary teams and data, allowing them to collaborate in real-time. The software was implemented at the Asanko gold mine in Ghana, enhancing collaboration between the teams spread across Canada, Africa, the US, the UK and Australia and reducing the time spent on modeling by 50%, according to feedback received from the mine. Endress and Hauser, a provider of sensors, has also found a higher demand for remote sensors operated through the cloud. For instance, on a remote tailings dam, its IoT-ready Netilion solution connects the information at the tailings dam into a cloud and makes it available in real-time on a mobile phone or an existing control system.

Brand agnosticism

Also related to enhanced collaboration is the trend towards brand or technological agnosticism – that is, de-

Insights on technology developments

Innovation for Sustainability

Explosives supplier

"We believe that DigiShot® Plus XRis the most accurate and precise electronic initiation system (EIS) for any size blast, enabling users to speed up deployment and loading, reduce blast delays and user errors, thereby improving safety and blast outcomes."

Nigel Convey, Vice President – EMEA, **Dyno Nobel**

Reagent supplier

"In 2024, we introduced D20-M3, a non-toxic alternative to cyanide for gold leaching, offering comparable leach kinetics to cyanide but with significantly reduced effluent that requires minimal treatment. We also supply cyanide-free depressants like Revadep 150 and Revadep 226, which provide substantial advantages in terms of safety, environmental impact, logistics and operational costs."

Quinton Giles, Managing Director, **Axis House Group**

Dust control and road stabilizer supplier

"Cypher offers two solutions: Our high-performing alternative to salt for dust control, and a solution that works as a stabilizer for clay. Both our technologies are designed to reduce rolling resistance by hardening the road, increasing its stability, and improving its properties so that there is less friction between the road and the tire of a haul truck, thus requiring less fuel."

Todd Burns, CEO, **Cypher Environmental**

Reality modelling software and services supplier

"AI is starting to play a significant role in high-precision surveying and modeling. AI technology helps realize pattern recognitions, feature extraction, and automatic modeling, capturing reality and creating digital twins, which helps towards faster and more informed decisions."

Ezzat Sabry, Founder, **Geomatex Integrated Solutions**

Collision avoidance systems and in-cabin measurement solutions supplier

"This year, we have enhanced our platform to provide detailed information about operations, rule adherence, and areas for improvement. This allows us to identify operators who need additional training. Additionally, we are promoting a new suite that includes a set of sensors that monitor various parameters inside the operator's cabin, providing insights into how operators are working and the conditions they are experiencing."

Gabino de Diego, Business Development, **TORSA**

Full flowsheet processing technologies supplier

"Across the full flowsheet, the most energy-intensive processes are crushing and grinding. We offer the HPGR/HPGR Pro for a more efficient and sustainable comminution. This advanced technology delivers up to 20% higher throughput while reducing energy consumption by up to 15% and extending roller life by up to 30%."

Bernard Kaninda, President EMEA, **FLSmidth (FLS)** vising tools that integrate or are compatible across different brands. Traditionally, large tech OEMs have provided both the hardware and the software required to automatize different processes within mining, which made miners dependent on single vendors and limited their flexibility.

*For example, Wenco introduced an international open standard for autonomy in mining, seeing the technology dependence on a single provider as a risk not only to Wenco's business but to innovation more generally. "A closed and proprietary approach to delivering technology goes against both the open knowledge principles of innovation and our own philosophy of having open standards and integration. To allow technologies to evolve, we needed an international open standard where different solutions coexist. This took a long time, but, thanks to the combined efforts of Wenco and the mining industry, the international standard for autonomous systems and fleet management system interoperability (ISO 23725:2024) has been published. This is a disruptive model, allowing greater competition and the application of existing technologies developed in other industries into mining. said Glen Trainor, VP commercial at Wenco International Mining Systems.

User-friendly interface

The ease of implementing new technology is always a factor determining adoption. We see a greater propensity to devise software tools that are easily delivered and applied.

*For example, Maptek, an Australian mining technology company with a global footprint, is adapting to the new generations of upcoming younger mining workers: "The mining industry is approaching a significant generational gap, with the current workforce holding a wealth of knowledge and experience and nearing retirement, while the new generation of young people are not keenly attracted to mining careers. Any new technology must consider the profile of future users and their expertise and eagerness to engage with it. This dynamic calls for simple-to-use solutions with immediate value realized," said Eduardo Coloma, the CEO of Maptek.

Modularity and flexibility

Given the logistics challenges posited by Africa in general, suppliers of bulky equipment, in particular, are differentiating through modular solutions assembled at the site, which reduces the difficulties of transportation of such equipment, improving both costs and delivery times.

*For example, Aramine, a supplier of machines for narrow-vein underground mines (the under-16 m^2 gallery segment), offers in-kit manufacturing: "Our machines can be assembled at their destination, which offers several advantages. First, it ensures better compliance with local regulations. Second, logistics are simplified, as transporting kits is much easier than shipping fully assembled machines. Finally, it allows us to partially localize the manufacturing process. For example, we have an agreement with a South African company to deliver in-kit battery machines, with the chassis manufactured locally," said Marc Melkonian, the CEO of Aramine.

Exploration focus

According to the Prospectors and Developers Association of Canada (PDAC), the probability that an exploration project will result in a mine is roughly 1 in 1,000 – similar to the odds of hitting the same number twice on a roulette wheel. Making exploration a more exact science has been the scope of innovative technologies aiding the expert geologist. According to the UN's Economic Commission for Africa, the continent generates only about 40% of the revenue potential of its resources. With most of its mineral value remaining underexplored, Africa is a high-growth market for geophysical services and the latest tools to identify new mineral targets.

*For example, Xcalibur Smart Mapping, a provider of airborne and geophysics services, identifies Africa as a key growth region for its smart mapping solutions, deployed already in Zambia, the DRC, Uganda, Nigeria, Botswana and Angola. In partnership with Sandford University and Mineral-X, Xcalibur initiated an AI and machine learning project to tackle multiple challenges associated with the mapping of natural capital on a large scale. ■

Insights from equipment providers

Tailings and Headwinds

"Western brands used to be the go-to option in Africa since they were the first to enter the markets, but today, Chinese brands are becoming more relevant. LiuGong is a proudly Chinese brand with top-tier components, including joint ventures with Cummins and ZF."

Axel Chasme, Regional Manager (West Africa), **LiuGong Machinery**

"In underground mining, where ventilation is crucial and human error can have tragic consequences, there is no doubt that fuel-free, autonomous equipment is the future. Currently, battery-powered machines represent 30% of our production, with the rest still diesel-based. However, I believe these ratios will shift significantly starting in 2025."

Marc Melkonian, CEO, **Aramine**

"By rental fleet size, Eazi Access was voted the number 1 rental company in Africa and the 64th largest in the world by Access International. With the recent addition of the Manitou OEM brand, Eazi Access has a broader suite of products. Manitou is extremely strong from a telehandler perspective, where we have seen great demand and room for growth."

Brett Kimber, CEO, **Eazi Access**

"Neemba is present in 11 West African countries. Gold miners throughout the region are working at near full capacity, and key commodities such as iron ore, lithium, and bauxite are also contributing to our optimism as producers expand capacity or renew fleets, which puts equipment demand in good health."

Adiline Haykal, Managing Director, **Neemba**

"At Mineral Technologies, we hate seeing valuable product wasted, so we make it a core value to make the most out of every resource in an ethical, sustainable, clean and efficient way. Our expertise lies in gravity separation, magnetic separation, and electrostatic separation. While Australia historically generated the bulk of our revenue, Africa now represents our largest pipeline."

James Agenbag, Regional Manager – Africa, **Mineral Technologies**

"TAKRAF is the last of the pioneering materials handling equipment suppliers still active in the Southern African market. Following a stellar performance in both 2022 and 2023, our 2024 pipeline unfortunately did not fully materialize. However, we are optimistic for next year given the upturn on both the political environment and the investment climate in many parts of the continent."

Richard Späth, Managing Director, **TAKRAF South Africa**

Governments, SOEs and Associations

Chamber of Mines Zimbabwe
EFEDCOM
Eskom
Minerals Council South Africa
Ministry of Mines and Energy Namibia
Ministry of Mines DRC
Ministry of Mines and Mineral Development Zambia
Rwanda Mines, Petroleum and Gas Board
Transnet

Financing

Absa Bank
Africa Finance Corporation
Development Bank of Southern Africa
European Bank for Reconstruction and Development
International Finance Corporation
Johannesburg Stock Exchange
London Stock Exchange
Nedbank
Rand Merchant Bank
Sandstorm Gold Royalties
Standard Chartered Zambia
Talent10 Holdings
Toronto Stock Exchange

Juniors and Producers

Gold
Akobo Minerals
Allied Gold
Alma Gold
Ankh Resources
ANS
Antler Gold
Asante Gold
Awalé Resources
B2Gold
Cora Gold
Endeavour Mining
Fortuna Mining
IAMGOLD
Kara Gold
Mako Resources
Montage Gold
Newcore Gold
Perseus Mining
Red Sea Resources
Sanu Gold
Society Artisanal
Theta Gold Mines
Thor Explorations
West Wits Mining

PGMs
Southern Palladium

Copper
Barrick Lumwana
BeMetals
BHP Exploration
Consolidated Copper Corp.
First Quantum Minerals
Ivanhoe Mines
Kobaloni Energy
Koryx Copper
Midnight Sun Mining
Mimosa Resources
Orion Minerals
Palabora Mining
Vedanta (Konkola Copper Mines)
Zamare Minerals

Uranium
Bannerman Energy
Deep Yellow
Elevate Uranium
GoviEx Uranium

Critical Minerals
Giyani Metals
Lifezone Metals
Manganese Metal Company (MMC)
Peak Rare Earths
Syrah Resources

3Ts
Trinity Metals
Woodcross Resources

Diamonds
Fura Gems
Petra Diamonds

Coal
E&T Minerals
Seriti Resources

Diversified
Afrimat
Kuvimba Mining House
Menar

Service and Equipment Providers

Consultancy and Engineering
Africa Practice
Ausenco
Environmental Resources Management
Knight Piésold
Lycopodium
METC Engineering
Resultant
SEMS Exploration
SRK
Ukwazi
Wood
Worley

Explosives and Blasting
Dyno Nobel
Orica

Logistics
AdhirCapital Drillingytra

Accounting and Auditing
Forvis Mazars
KPMG Zambia
PwC Zambia

Drilling
Blu Rock Mining Services
Capital
Master Drilling

Digital Solutions
Endress+Hauser
Energy Exemplar
Maptek
Minehub
Seequent
TORSA
Wenco International Mining Systems

Equipment
Aramine
Barloworld
Eazi Access
FLSmidth
Kanu Equipment
LiuGong
Loesche
Mincon
Mineral Technologies
Neemba
Red Spot Zambia
Takraf

Energy
Aggreko
CrossBoundary Energy
Indeni Energy
JA Solar
Solarcentury
Vivo Energy
Volt Vision

Law
A.M.W and Company
ENS
Malan Scholes Attorneys
Mulenga Mundashi Legal Practitioners
Three Crowns

Other
AFEX Fire Suppression Systems
Amotech
Axis House
Bureau Veritas
Cypher Environmental
Geomatex
Minespider
OpSys International
Rand Refinery
SciAps
Stratum International
The Particle Group
XCalibur Smart Mapping

Editorial and Management Team

Lorena Stancu
Senior Project Director and Journalist

Salma Khaila
Project Director

Helene Jaspers
Project Coordinator

Executive Editor:
Mungo Smith

Operations Director:
Miguel Pérez-Solero

Graphic Designer:
Kaori Asato

Graphic Designer (ads):
Özgür Ergüney

Graphic Designer (cover):
Gonzalo Da Cunha

General Manager:
Alfonso Tejerina

Your opinion is important to us, please be in touch to share your comments on this report: info@gbreports.com.
For updated industry news from our on-the-ground teams around the world, please visit our website, where you can subscribe to our newsletters, and follow us on LinkedIn (gbreports) and X (@GBReports).

THANK YOU

We would like to thank the honorable ministers, authorities and industry executives who took the time to meet with us.

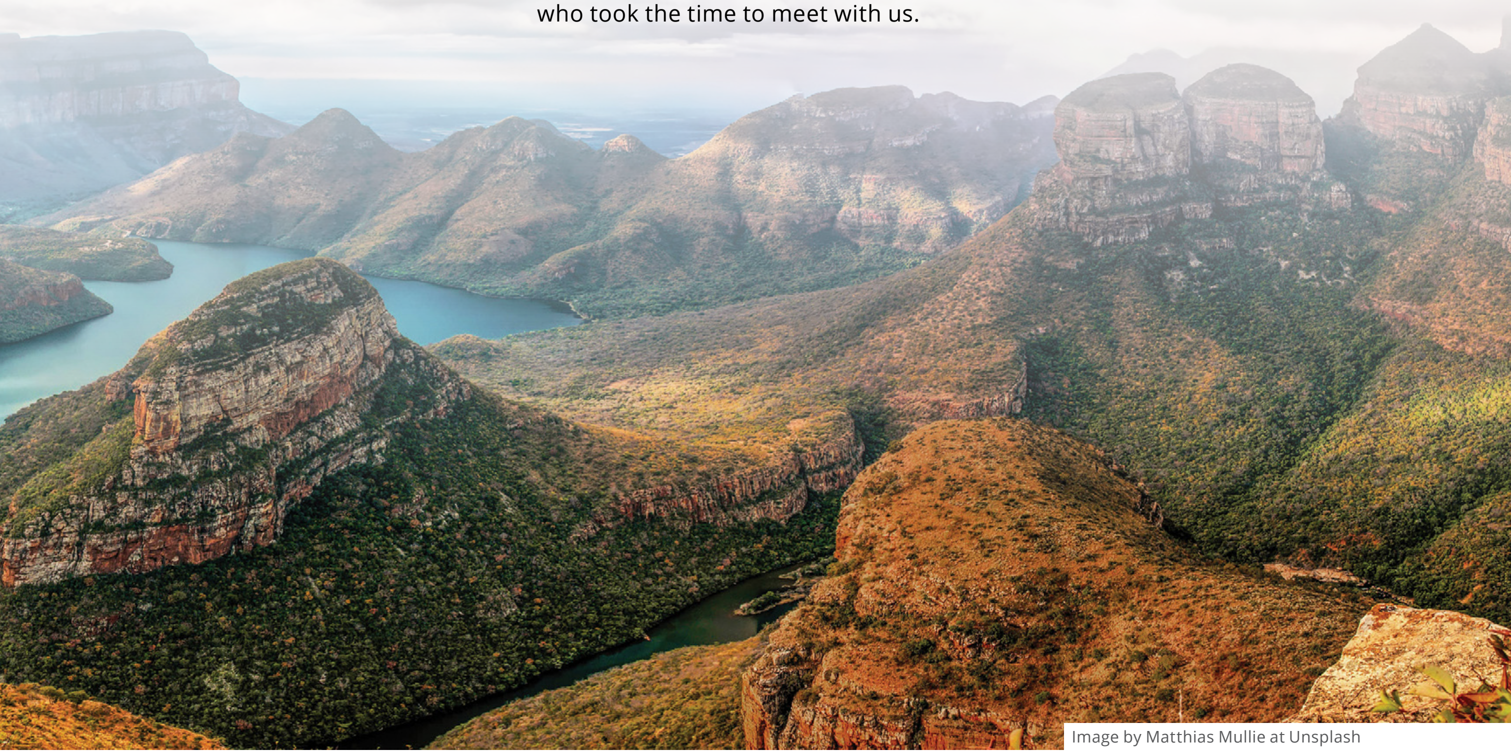


Image by Matthias Mullie at Unsplash

Global Business Reports