

CKM Copperbelt *mining* KATANGA

SA MINING VETERAN, RIAAN VERMEULEN APPOINTED AS KAMOA COPPER'S NEW MANAGING DIRECTOR

Inside this edition

FQM'S KALUMBILA MINERALS
REBRANDS TO
FQM TRIDENT LIMITED 12

AT PHASE 4 (BY 2028),
KAMOA-KAKULA PROJECT SHOULD
PRODUCE 1 MILLION TONNES
OF COPPER IN DRC 13

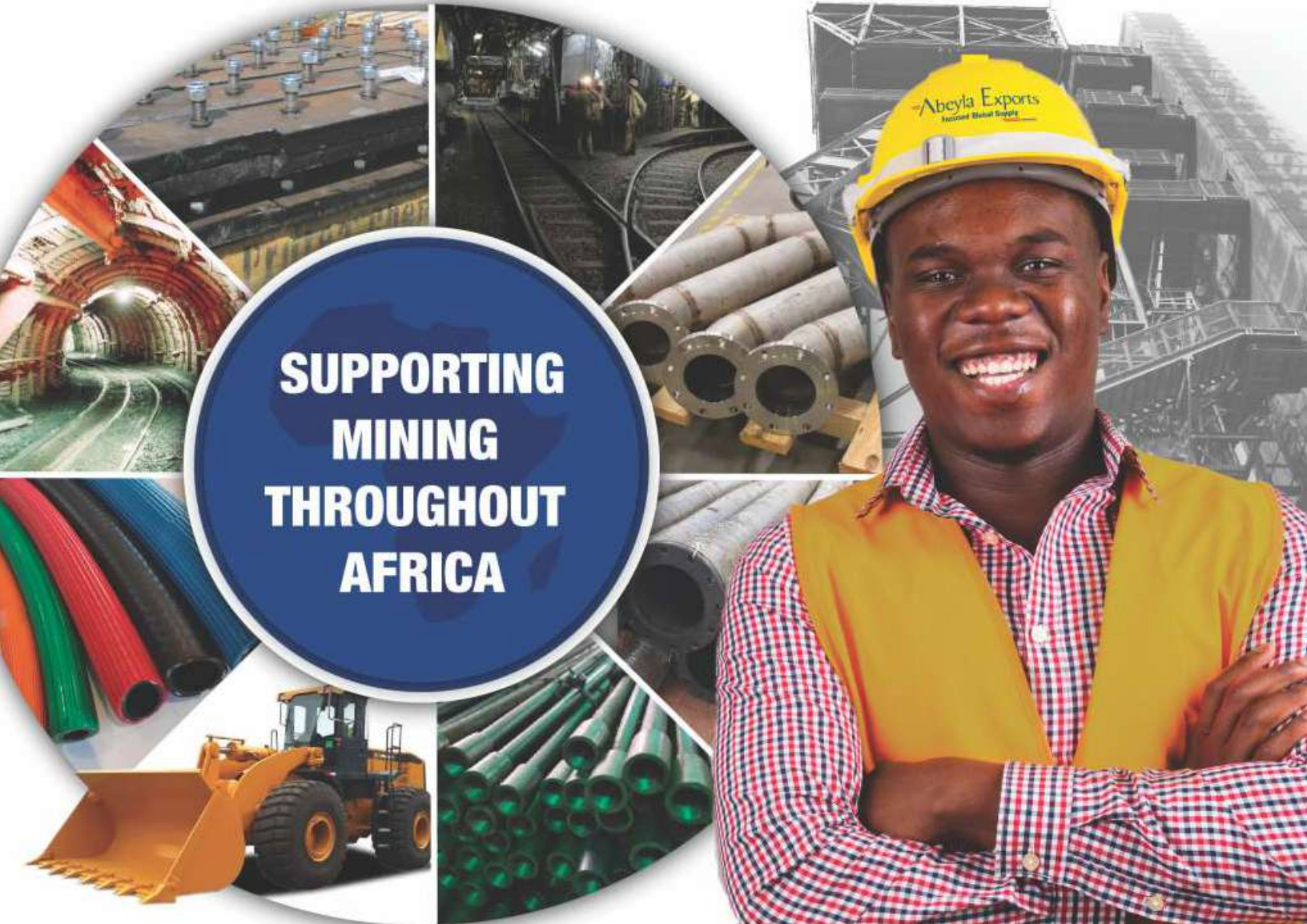
CHINA'S ZIJIN MINING LAUNCHES
FIRST LITHIUM EXPLORATION
PROJECT IN DRC 27

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Contents

Cover Story

SA Mining Veteran, Riaan Vermeulen Appointed as **Kamoa Copper's** New MD 9

News Briefs

Trafigura to Mobilize **USD 600 Million** to Complete the Construction of the **Mutoshi Copper and Cobalt Mine**..... 6

China's Zijin Mining Launches First Lithium Exploration Project in **DRC** 6

Corporate News

Central Copper Expands **DRC** Copper Portfolio..... 7

Kibali Produced More Than **800,000 Ounces** of Gold In 2021 in **DRC**, -**CEO Mark Bristow**7

Hitachi to Sell Half its Digger Unit Stake for **\$1.6 Billion** 8

DRC & ZMB Local News

DRC- Kamoa Copper Phase **2 Mill 93%** Complete, Commissioning Expected April 2022 11

FQM's Kalumbila Minerals Rebrands to **FQM Trident Limited**.....12

Zambia's President Hands Over the **Black Mountain** to Cooperative, Women in Mining and the Host Community 14

Zambia the Stand-Out Player in **African Mineral Exploration** for 2022: Experts 15

International News

Trigon Produces First Concentrate at **Kombat Mine** in **Namibia** 16

Newly Elected President of **Zambia** to Attend **Mining Indaba 2022**..... 17

Technology & Innovation

Sandvik Trials Largest Capacity **Electric Truck** 18

Complete Lighting Solution for **South Africa's** Longest Road Tunnel – **Beka Schröder** 19

Feature Highlights

Galileo Upbeat on Modeling Progress at **Zambia's Luansobe**21

SRK Appoints **Sambwa** as **DRC Chair**22

Tertiary Minerals Raises **GBP 500,000** for Metal Exploration in **Nevada & Zambia**22

BME's Axxis Titanium™ Initiates Record Blast in **SA** 23

ADVERTISER INDEX

Abeyla SteelIFC

KSB Valves and Pumps ..Page 5

BSI SteelPage 6

Prosteel Page 6

ReprographixPage 11

CSI Mining Page 13

DRC Mining WeekIBC

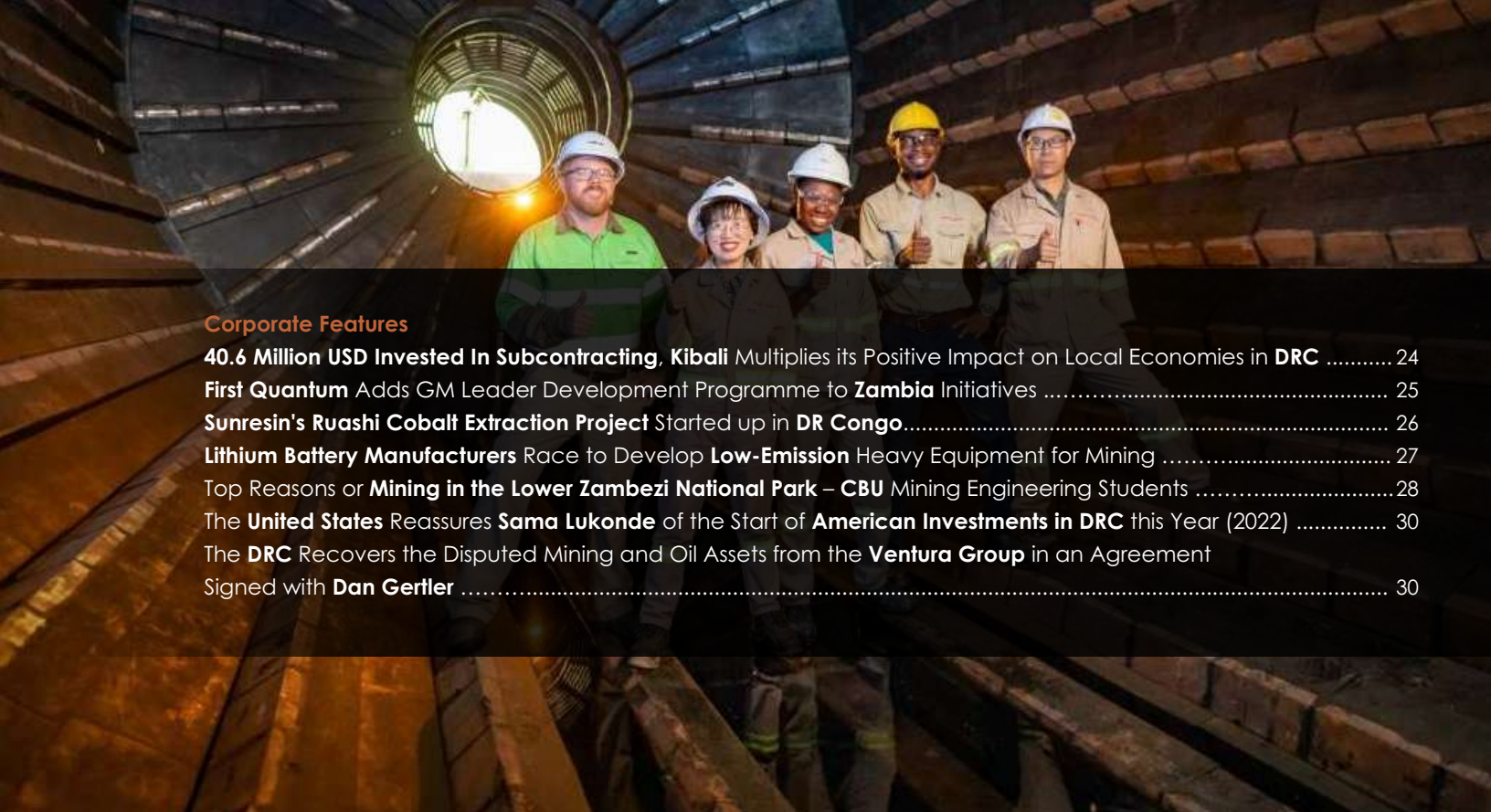
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Corporate Features

40.6 Million USD Invested In Subcontracting, Kibali Multiplies its Positive Impact on Local Economies in **DRC** 24

First Quantum Adds GM Leader Development Programme to **Zambia** Initiatives 25

Sunresin's Ruashi Cobalt Extraction Project Started up in **DR Congo**..... 26

Lithium Battery Manufacturers Race to Develop **Low-Emission** Heavy Equipment for Mining 27

Top Reasons or **Mining in the Lower Zambezi National Park** – **CBU** Mining Engineering Students28

The **United States** Reassures **Sama Lukonde** of the Start of **American Investments in DRC** this Year (2022) 30

The **DRC** Recovers the Disputed Mining and Oil Assets from the **Ventura Group** in an Agreement Signed with **Dan Gerler** 30

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A 2022 NEW YEAR'S MESSAGE TO ZCCM-IH SHAREHOLDERS

"Our stance will entail a commitment to leading a Company that upholds the highest institutional standards regarding environmental, social and governance principles including transparency and accountability", Dolika Banda, ZCCM-IH Board Chairperson.



SIGNING CEREMONY: THE ALLOCATION OF 0.3% OF THE TURNOVER OF MINING COMPANIES FOR THE BENEFIT OF LOCAL COMMUNITIES IN THE DRC

The great satisfaction of two ministers for the day's event was to finally see local communities impacted by mining projects benefit from substantial financial benefits for their development.

A salutary measure which thus puts an end to the paradox "DRC-very rich country with a very poor population".

The endowment of 0.3% for the benefit of local communities will generate significant financial resources that require orthodox management under the supervision of a specialized body with legal personality.

For better monitoring and evaluation of this management, a procedure manual is planned, which is a reference instrument to serve as guidelines for all stakeholders for the rational management of this allocation.

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OUTPUT FALLS AMID COVID CHALLENGES

Switzerland-based mining company Glencore saw the production of most of its minerals fall year-on-year (YoY) in 2021 as the COVID-19 pandemic continued to affect operations.

The company saw falls in copper, zinc, lead, nickel, gold and silver production. The most significant drop was in lead, which declined by 14% YoY to 222,000 tonnes, followed by gold, which fell by 12% YoY to 809,000 tonnes.

However, the miner did see an increase in ferrochrome production output, which jumped by 43% to 1.46 million tonnes, and coal-coking, which rose by 20% to 9,100 tonnes.

Despite seeing production fall, Glencore said its results were "inline" with guidance expectations. It pointed out that it acquired Cerrejon, an open-pit mine in Colombia, and Ernest Henry, a copper mine in Australia, as part of its strategy to move away from coal in favour of the "materials needed for the energy transition."

The company attributed the fall in production to the continuing challenges caused by the COVID-19 pandemic. Gary Nagle, Glencore's chief executive officer, described the operating environment in 2021 as "challenging" but said mining would be "increasingly important" for global decarbonisation.

"Maintaining production in 2021 became increasingly important as many of our products, so crucial for decarbonisation, energy supply and industrial output, saw higher levels of demand," Nagle said.



TRAFIGURA TO MOBILIZE USD 600 MILLION TO COMPLETE THE CONSTRUCTION OF THE MUTOSHI COPPER AND COBALT MINE

Shalina Resources and its Congolese subsidiary Chemaf have signed a new partnership agreement with Trafigura under which the latter will help it raise USD 600 million to finance its copper and cobalt activities in the DRC. The funds will mainly be used to complete the construction of the Mutoshi industrial mine which is scheduled to start production in the third quarter of 2023, according to a tweet from Trafigura.

Under the terms of the agreement between Trafigura and Shalina, the commodity trader will raise the funds through a syndication process with several international banks. In exchange, he wins the right to market all the cobalt hydroxide that will be produced by Chemaf, which is also building an SX-EW treatment plant in Kolwezi and wants to expand its Etoile plant located in Lubumbashi.

"The new production in Mutoshi, will make Chemaf one of the largest producers of cobalt in the world, at a time when the demand for batteries for electric vehicles and copper for increased electrification as part of the transition energy is experiencing exponential growth from customers around the world," Trafigura said



CHINA'S ZIJIN MINING LAUNCHES FIRST LITHIUM EXPLORATION PROJECT IN DRC

China's Zijin Mining Group Co. Ltd said on Monday it had officially launched its first lithium exploration project through a joint venture with Democratic Republic of Congo- (DRC-) owned firm Cominiere.

The joint venture, called Katamba Mining, has secured mining rights to two greenfield exploration and mining projects at the periphery of the Manono lithium mine in the DRC, "in order to enhance Zijin's competitiveness in new energy minerals," the miner said in a statement.

Manono lithium mine is controlled by Australia's AVZ Minerals, and the mine's reserves of lithium oxide reach 8.78 million tonnes, the statement said.

Global demand for lithium is rising as the mineral is used in lithium-ion batteries for electric vehicles.

Earlier in November, Zijin Mining had also approved investment in a smelter for its Kamo-Kakula copper project alongside Ivanhoe Mines in the DRC in a move to reduce reliance on third-party smelters.

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CENTRAL COPPER EXPANDS DRC COPPER PORTFOLIO

UK-headquartered Central Copper Resources (CCR) has acquired 100% ownership of Titan Mining & Exploration, which holds 78% of the Kayeye project, in the Democratic Republic of Congo (DRC).

The project entails a licence area of 231 km², adjacent to TSX-listed Ivanhoe Mines' Kamoa-Kakula project.

CCR says the acquisition adds to the company's exploration potential for new copper discoveries, since it also has a 65% interest in Cornilu, in the DRC, which owns the prefeasibility-level Mbamba Kilenda project and 12 additional licences covering 80 km of prospective strike.

The company also owns 100% of the Lunga copper project, in Zambia.

CCR plans to advance all of its projects through respective short-term work programmes, including resource expansion at Mbamba, geochemical sampling and geophysics over areas adjacent to Mbamba, and geophysical work to support drill targeting at Kayeye and Lunga.

The company also intends to advance a definitive feasibility study of Mbamba's Phase 1 development.

CCR is finalising a short-term funding package to advance the projects, prior to an intended Aim listing later this year.

Newly appointed CEO Luke Knight says consistent feedback during recent marketing has highlighted that CCR and its portfolio of projects are more suited to alternative exchanges that put a higher value on the exploration potential of its assets, and CCR's ability to significantly add to the mineral inventory of those assets in the near term.

"The wealth of exploration and technical expertise within the company will ensure CCR returns to market at an appropriate time with both best-in-class exploration targets and the potential for near-term production over its flagship Mbamba project."



KIBALI PRODUCED MORE THAN 800,000 OUNCES OF GOLD IN 2021 IN DRC, -CEO MARK BRISTOW

According to Mark Bristow, Chairman and CEO of Barrick, this range is higher than the 2021 objectives. He said so during a press conference held this Friday, January 21, 2022.

On this occasion, Mr. Barrick returned to the other highlights that marked Kibali Gold Mines during the 2021 financial year.

First : on the investment side, dividends of \$179 million were paid to shareholders in the fourth quarter. Along with Barrick, AngloGold Ashanti and Sokimo, bringing the total payout for the year to US\$200 million.

It should also be noted that US\$49.6 million was spent with local contractors and suppliers in the fourth quarter. Bringing the total since Kibali's inception to US\$2.1 billion.

It should be noted that all the expenses incurred by this mining giant in the DRC were made in the form of taxes, permits, infrastructure, salary and payment to local partners.

Second : in the technology sector. Here, design work for the AZMET cyanide destruction plant began in the fourth quarter and is on track to achieve accreditation from the International Cyanide Management Institute (ICMI).

Also note that the second CTSF elevator is on track using waste rock supported by a local contractor with 72% of construction completed to date.

Kibali has also invested in implementing the utility for remote worksite bottlenecks. This allowed the operation of the loaders from the surface control room, entirely operated by local Congolese labour.

Also, the pipeline from the KCD dam to the processing plant is complete. This will make it possible to recycle and reduce water withdrawal from the Kibali River.

Also related to the technology sector, Kibali has commissioned a pumping system to reduce the use of fresh water.

Third : in health and safety. No lost time accident (LTI) or significant environmental incident recorded for the fourth quarter.

Regarding the Covid-19 pandemic, 5,847 vaccines have been administered to date, i.e. 43% of the workforce fully vaccinated and an additional 14% have received a dose.

Fourth : environmental sector. In this regard, " Garamba Alliance " was launched with a joint partnership with the United States Agency for International Development (USAID) to support biodiversity and improve the livelihoods of communities.

We also note the maintenance of ISO 45001 health and safety certification and ISO 14001 environmental certification.

HITACHI TO SELL HALF ITS DIGGER UNIT STAKE FOR \$1.6 BILLION

Japanese industrial conglomerate Hitachi Ltd. will sell about half of its stake in its construction machinery unit to a group including Itochu Corp. for 182.5 billion yen (\$1.6 billion).

The company will sell a 26.1% holding in Hitachi Construction Machinery Co. for 3,300 yen a share in June, Tokyo-based Hitachi Ltd. said Friday in a statement. That's a premium to its closing price of 2,976 yen.

Hitachi will retain a 25.4% stake after the sale, which also includes Japan Industrial Partners Inc. as a buyer.

For Hitachi, the sale is the latest in a decade-long portfolio overhaul aimed at shifting focus to its higher-margin digitalization business. Bloomberg News reported in December that the company was working with a financial adviser to field interest for its 40% stake in Hitachi Transport System Ltd.

Hitachi Construction Machinery was established in 1970 and is a major global equipment maker, building and selling excavators, loaders and dump trucks for the construction and mining industries. It had sales of 813.3 billion yen last fiscal year and

employs about 25,000 people worldwide, according to the company's website.

The industrial conglomerate has signed a string of multi-billion-dollar deals including the purchase of US software development company GlobalLogic Inc. for \$9.6 billion. A \$3.5 billion deal announced in April to sell its stake in Hitachi Metals Ltd. to a group led by Bain Capital has faced regulatory delays.

For Itochu, a Japanese trading giant whose business spans from textile to convenience store chains, the deal will expand its construction machinery business. Itochu and Hitachi Construction Machinery have already operated a joint venture in Indonesia for 30 years.

The deal will help Hitachi Construction develop an independent distribution and service network for its products in North America, after it announced plans to end a longtime alliance with US partner Deere & Co. last year.

Hitachi Construction Machinery shares plunged 18% on Friday, the biggest drop since October 2008, a day after broadcaster NHK reported the sale of the company.

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SA MINING VETERAN, RIAAN VERMEULEN APPOINTED AS KAMOA COPPER'S NEW MANAGING DIRECTOR



KAMOA COPPER CONTINUES TO BOLSTER SENIOR LEADERSHIP TEAM WITH APPOINTMENT OF ZHANG "FRANK" XINGXUN AS EXECUTIVE DIRECTOR

Kolwezi, Democratic Republic of Congo – Ivanhoe Mines (TSX: IVN) (OTCQX: IVPF) President, Marna Cloete, announced today that Riaan Vermeulen has been appointed as Kamo Copper's new Managing Director, effective June 1, 2022.

SA Mining Veteran, Riaan Vermeulen Appointed as Kamo Copper's New Managing Director 2

Riaan Vermeulen

Mr. Vermeulen will work with Kamo Copper's current CEO Mark Farren during a handover period to ensure a smooth transition prior to Mr. Farren's retirement.

Mr. Vermeulen has more than 32 years of underground and open-pit mining experience in various operational, project and technical management roles, including Acting Head of Mining: Base Metals for Anglo American.

His most recent role was Head of Projects with Debswana Diamond Company in Botswana, where he was responsible for all major projects, including Jwaneng Underground, Orapa Cut 3 and Orapa 2 plant expansion projects.

Prior to joining Debswana, Mr. Vermeulen was Head of Business Planning and Investments, Head of Technical and Head of Mining with De Beers. Prior to that he was Head of Mine Planning with Anglo Platinum.

Mr. Vermeulen previously worked closely with Mr. Farren at Anglo Platinum, where they designed and built Anglo Platinum's most efficient underground mine – the Middelpunt Hill Platinum Mine.

Mr. Vermeulen has experience across different commodities, including base metals (copper, zinc, lead, niobium and phosphates), precious metals (gold and platinum) and diamonds. He has multi-geographical experience working in South Africa, Botswana, Namibia, Chile, Brazil, Ireland and Canada. He holds a Master's degree in Mechanical Engineering and a Bachelor's in Mining Engineering. He also is a registered Professional Engineer in Botswana and South Africa.

SA Mining Veteran, Riaan Vermeulen Appointed as Kamo Copper's New Managing Director 3

Zhang "Frank" Xingxun

Joining Mr. Vermeulen on Kamo Copper's executive management team is Zhang "Frank" Xingxun as Executive Director.

Mr. Zhang is a long-serving senior executive with Zijin Mining, and has held senior management positions at Zijin's flagship Zijinshan Gold & Copper Mine and Smelter (Fujian), and Zijin's Kolwezi copper operations – La Compagnie Minière de Musonoie Global ("COMMUS").

During his career, Mr. Zhang has successfully implemented several large-scale technological projects for mine processing optimization, which has earned him numerous awards, including the Science and Technology Award issued by the China Nonferrous Metals Industry Association.

"We are thrilled to welcome Riaan and Frank into our family. Their seasoned experience will play an integral part in the next chapters of the Kamo-Kakula growth story," said Ms. Cloete. "New expansions and exploration opportunities will allow us to continue to build a bigger and bolder mining complex. We are incredibly excited about what is yet to come."

About the Kamo-Kakula Copper Complex

Kamo-Kakula is the world's fastest growing major copper mine. Kamo-Kakula began operations in May 2021 and produced approximately 106,000 tonnes of copper in concentrate in 2021. Kamo-Kakula's 2022 production guidance is between 290,000 to 340,000 tonnes of copper in concentrate.

Based on independent benchmarking, the project's phased expansion scenario to 19 Mtpa would position Kamo-Kakula as the world's second-largest copper mining complex, with peak annual copper production of more than 800,000 tonnes.

The Kamo-Kakula Copper Project is a joint venture between Ivanhoe Mines (39.6%), Zijin Mining Group (39.6%), Crystal River Global Limited (0.8%) and the Government of the Democratic Republic of Congo (20%). A 2020 independent audit of Kamo-Kakula's greenhouse gas intensity metrics performed by Hatch Ltd. of Mississauga, Canada, confirmed that the project will be among the world's lowest greenhouse gas emitters per unit of copper produced.

About Ivanhoe Mines

Ivanhoe Mines is a Canadian mining company focused on advancing its three principal projects in Southern Africa: the development of major new, mechanized, underground mines at the Kamo-Kakula copper discoveries in the Democratic Republic of Congo and at the Platreef palladium-rhodium-platinum-nickel-copper-gold discovery in South Africa; and the extensive redevelopment and upgrading of the historic Kipushi zinc-copper-germanium-silver mine, also in the Democratic Republic of Congo.

Kamo-Kakula began producing copper concentrates in May 2021 and, through phased expansions, is positioned to become one of the world's largest copper producers. Kamo-Kakula is being powered by clean, renewable hydro-generated electricity and is projected to be among the world's lowest greenhouse gas emitters per unit of metal produced. Ivanhoe Mines has pledged to achieve net-zero operational greenhouse gas emissions (Scope 1 and 2) at the Kamo-Kakula Copper Mine. Ivanhoe also is exploring for new copper discoveries on its Western Foreland exploration licences in the Democratic Republic of Congo, near the Kamo-Kakula Project.



DRC HAS THE POTENTIAL FOR BETTER RESOURCE DEVELOPMENT- CONDRA CRANES

Condra Cranes notes that the company is "very positive going into 2022, as Africa remains a good market and has good prospects".

The Gauteng-based company which is a supplier of cranes originally established its footprint in Zambia before expanding into the DRC.

Expressing a positive outlook for the African mining industry in 2022, Condra Cranes MD Marc Kleiner, says the Democratic Republic of Congo (DRC) has the potential for better resource development.

There is a significant opportunity for the DRC to grow by developing its resources, he notes, adding that "the country could probably better develop its resources, and maybe add more value going forward. Time will tell how much they invest in their infrastructure".

Among the mining activities in the DRC, both copper plate and copper concentrate are being produced, although concentrate production is in decline because of local export tariffs. The DRC government is incentivising adding value within the country rather than exporting the mineral for others to make

the plate, he says.

"The DRC is mining ore and shipping concentrate, and while metals concentrate is not that popular anymore, plates are being shipped."

Condra Cranes supplies parts to and has a maintenance agreement with several mines in the DRC. The company supplies overhead cranes to tankhouse leaching plants for copper mines in the southeast of the country, as well as overhead service and maintenance cranes for plants and workshops at a gold mine in the north.

Designed to work on leach plates, the tank house cranes work at higher cycle times and speeds, whereas workshop cranes carry heavier loads. The overhead cranes lift and position plates and slabs during the electrolytic refining process.

"We are busy with a batch of additional spares for the maintenance of the cranes. It is essential to keep these machines running, given that the copper price has been trading at [about] \$9 500/t. So, it is lucrative for the mines to maximise productivity. For that they need overhead cranes and, being a supplier within the southern part of the continent,

we can supply parts quicker than companies from Europe."

While the company produces its products and machines in South Africa, Kleiner explains that products and spares can be delivered to the DRC within 48 hours if needed.

"We have a good response time in terms of service and parts", which benefits Condra Crane's clients in the DRC, as they have more uptime and, therefore, better production rates.

However, he explains that delivering Condra Cranes products to the DRC can prove challenging because of customs delays at border crossings, as well as the road infrastructure that often cannot support abnormal-load vehicles, ultimately creating additional costs for product delivery.

While the company has no plans as yet to expand to the DRC, it does aim to expand its footprint within the Southern Africa mining industries.

"We are seeking to increase our growth, looking at the rest of Africa on our doorstep", concludes Kleiner.

JSE- and TSX-V-listed tin miner Alphamin Resources, which owns and operates the Mpama North mine in the Democratic Republic of Congo, increased its contained tin production by 10% quarter-on-quarter to 3 114 t in the fourth quarter ended December 31.

A producer of 4% of the world's mined tin, the miner also increased its contained tin sales during the period by 13% to 3 056 t, while its earnings before interest, taxes, depreciation and amortisation guidance was a record \$74-million – up 38% from the third quarter.

Quarter-on-quarter, Alphamin's net cash increased by 6 486% from \$1.03-million in the third quarter, to \$68-million in the fourth quarter.

In line with Alphamin's vision to become a major sustainable tin producer, and from a capital allocation perspective, the miner's board considered the combination of significant exploration, investment in growth and a high dividend yield – a robust value proposition leading to it declaring a 2021 financial year dividend of C\$0.03 a share (\$30-million in the aggregate).

The dividend is payable on February 11 to shareholders of record as of the close of business on February 4.

Dividend distributions will be considered based on excess free cash after taking account of working capital requirements, reserve contingencies and expansion opportunities.

In terms of tin processing, the miner produced 1% less quarter-on-quarter at 107 981 t, while the grade of tin improved to 3.9% tin, from 3.5% tin in the third quarter.

**ALPHAMIN'S
TIN OUTPUT UP
10 percent
Quarter per Quarter,
CASH UP
6 486 percent**

DRC: KAMOA COPPER PHASE 2 MILL 93% COMPLETE, COMMISSIONING EXPECTED APRIL 2022

Kamoa Copper's 3.8 million tonnes per annum (Mtpa) mill is 93% complete as of January 31, 2022. Concentrator hot commissioning to begin in April 2022, ending previous forecast of Q2 2022 and several months before the initial schedule.

Hot commissioning involves introducing the first ore into the plant at a reduced feed rate to set equipment parameters and test performance. The feed rate is then regularly increased.

Kamoa Copper continues to make significant progress on the construction of the Phase 2 mill, and the mill is expected to be approximately 93% complete by the end of January. Hot commissioning is now expected to begin in April, and the first copper concentrate produced from the Phase 2 plant is expected approximately one week after the ore is fed into the ball mills.

The Stage 2 plant is identical to the 3.8 Mtpa Stage 1 mill and a faster ramp-up profile is expected, with the added benefit of operational knowledge gained during commissioning, phase 1 service.

By comparison, the Stage 1 concentrator reached monthly design throughput in September 2021, which was the fourth full month of operation. The first ore was brought into Kamoa Copper's Phase 1 Concentrator on May 20, 2021 and the first concentrate was produced from the Phase 1 Plant on May 25, 2021. The Phase 1 Concentrator is currently operating at a rate higher than its design, capacity of 3.8 Mtpa

by more than 15%, with 117% of nominal flow reached in December. Copper recoveries are also achieved that exceed design recovery by 86%, depending on power quality, with December recoveries being approximately 2% higher.

Ivanhoe Mines is a Canadian-based mining company focused on advancing its three main projects in Southern Africa: the development of major new mechanized underground mines at the Kamoa-Kakula copper discoveries in the Democratic Republic of Congo and at Platreef palladium- rhodium-platinum – discovery of nickel-copper-gold in South Africa; and the extensive redevelopment and modernization of the historic Kipushi zinc-copper-germanium-silver mine, also in the Democratic Republic of the Congo.

Kamoa-Kakula began producing copper concentrates in May 2021 and, through incremental expansions, is positioned to become one of the largest copper producers in the world. Kamoa-Kakula is powered by clean, renewable hydroelectric electricity and is expected to be among the lowest emitters of greenhouse gases in the world per unit of metal produced. Ivanhoe Mines is committed to achieving net zero operational greenhouse gas emissions (Scope 1 and 2) at the Kamoa-Kakula copper mine. Ivanhoe is also exploring new copper discoveries on its Western Foreland exploration licenses in the Democratic Republic of Congo near the Kamoa-Kakula project.

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FQM'S KALUMBILA MINERALS REBRANDS TO FQM TRIDENT LIMITED

KALUMBILA, ZAMBIA – Kalumbila Minerals Limited has changed its trading name to 'FQM Trident Limited' – a name that incorporates the mining firm's identity as a First Quantum Minerals-owned company and is inclusive of all the Trident Project operations.

Since its inception, the company's mining operations and project has incorporated three mining licences, namely Sentinel, Enterprise, and Intrepid which collectively make up 'The Trident Project.'

Constructed over four years from 2012, the mine represents US\$2.1 billion of investment – Zambia's largest infrastructure investment since the Kariba Dam was constructed in 1959. The operation is based on sophisticated technology – including the world's largest steel-ball mills and the world's largest semi-mobile rope shovels.

"From our original trading name, Kalumbila Minerals Limited, our mining site was commonly referred to simply as 'Kalumbila,'" explained FQM Trident Ltd's General Manager, Sean Egner.

"This has been a source of confusion and misunderstanding with the names of the town and district being the same. Additionally, in all our communications and letterheads we have made use of either 'The Trident Project, Sentinel Mine' or 'Kalumbila Minerals Limited' and sometimes both. The name change will reduce the ambiguity and confusion that the old name caused," he added.

The rebranding process is expected to be completed during the first quarter of 2022. Thereafter, all communications and correspondence will be transitioned to

reflect FQM Trident Limited.

"FQM Trident Limited will remain a fully owned subsidiary of First Quantum Minerals Limited as there is no ownership or control structure change. There will be no changes to conditions of employment or any effect to the day-to-day operations at Sentinel and Enterprise Mines," Mr Egner noted.

FQM Trident Ltd employs over 6,000 people – predominantly Zambian nationals.

The mine's presence in Kalumbila District, and North-Western Province as a whole, has had a positive impact on the area's economy with several off-shoot businesses in transportation, agriculture, hospitality, and other services emerging to cater to the needs of the mine, its employees, and subcontractors.



ECUADOR, BECOME A MINING PROVINCE

Equateur Province is known as a major supplier of timber in the Democratic Republic of Congo and abounds in dense forest. In this period of global warming, where the DRC is considered a solution country by its forest, most of which is located in the Equateur Province, information informs about the existence of several indices of mineral substances in this Province and this, in all of its Territories including Basankusu, Bikoro, Bolomba, Ingende and Lukolela. These indices include the commodities below; Gold, Diamond, Coltan, copper.

It is within this framework that the Provincial Minister of Mines of Ecuador His Excellency Henry BALEKA BONGETOLA is staying in Kinshasa to lobby the National Authorities. His speech fell on the attentive ear of HIS EXCELLENCY ANTOINETTE N'SAMBA KALAMBAYI, NATIONAL MINISTER OF MINES who recently received him in audience and made him available to the specialized services of the Ministry of Mines, in particular the CTCPM, the CAMI and the SGN-C.

The latter, the National Geological Service of Congo, SGN-C in acronym whose mission, among other things, is exploration, opened its doors to the Provincial Minister of Mines of Ecuador.

It is in this context that a rich working session was held this Wednesday, January 12, 2022, led by the Director General of the SGN-C, Professor Dona KAMPATA MBWELELE, Doctor of Geology, who reassured the Minister in presenting him with the map of occurrences and providing him with the necessary information concerning the province.

Finally, they agreed to draw up a roadmap which will be submitted for the approval of Her Excellency the National Minister of Mines.

The future will tell us better.



EAST AFRICAN COMMUNITY APPROVES DRC'S APPLICATION FOR MEMBERSHIP

The Council of Ministers of the East African Community (EAC) has approved the admission of the Democratic Republic of Congo to this regional bloc. The announcement was in a press release consulted on Saturday February 12 on the community's website.

According to this press release, this approval was made on Tuesday, February 8, following negotiations held between the EAC and the DRC from January 15 to 24 in Nairobi, Kenya.

The EAC negotiating team was led by Dr Alice Yalla, Secretary for Integration at the Ministry of EAC and Regional Development and Professor Serge Tshibangu, Special Envoy of DRC President Félix Tshisekedi, specified the document.

The council has now instructed the EAC secretariat to develop a draft roadmap for the integration of the DRC into the community and submit it to the council for consideration.

"The DRC delegation was in Nairobi the last week of January 2021. Negotiations with DRC were concluded and a negotiating framework matrix was jointly adopted," said Adan Mohamed, Cabinet Secretary, EAC and Regional Development, shortly after an extraordinary council meeting virtually on Tuesday, February 8.

For his part, Peter Mathuki, Secretary General of the East African Community, said that this membership would facilitate the free movement of goods for the DRC, especially in the eastern part of the country. In addition, the DRC should also appoint, once the accession process is completed, judges to the East African Court of Justice.

The admissions process was initiated by an application from the DRC in 2019 to join the first stage of the EAC admissions process.



Services

- Consultation in tankhouse environment
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- Flooring maintenance
- Cell commissioning & alignment
- On-site drain Installation and maintenance
- Pipe work and maintenance
- Cathode Refurbishment

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ZAMBIA'S PRESIDENT HANDS OVER THE BLACK MOUNTAIN TO COOPERATIVE, WOMEN IN MINING AND THE HOST COMMUNITY.

Zambia's President Hakainde Hichilema has handed over the famous black mountain, a mineral rich slag dump of mining waste from the previous ZCCM mining days situated in Nkana, Kitwe on the Copperbelt Province of Zambia. In his statement, President Hichilema said the site has been given to three groups who have been given licenses to operate and these includes a Consortium of cooperatives representing all the 10 districts of the Copperbelt province, Women in Mining and the Community that hosts the black mountain.

Below is the President's statement on the handover of the Black Mountain;

"My fellow citizens, The new dawn government is committed to improving the lives of the Zambian people by reviving the economy and bringing about inclusive development. Our government appreciates the enormous value and great potential of the mining sector, and its ability to be a major factor in our country's economic transformation.

Now is the time to bring about sanity in the mining sector, that has been ravaged by greed, corruption and unscrupulous practices by certain investors and those charged with governance. When we said it was time for change, we meant it and we intend to ensure that we work towards achieving the bold vision of

annual copper production of three million metric tonnes and most importantly, the inclusion of Zambians in this incredible growth story.

Our women, youth and the communities in which mining operations are based, are highly expectant and deserve to be included in various aspects of the mining industry's supply chain.

In an effort to empower Zambians, our government has decided to make available part of the black mountain in Kitwe.

Following consultation and due diligence, we are officially handing over part of the slag dump to cooperatives owned by Zambian youth and women, who have been granted licenses to operate.

The beneficiaries include:

- i. Consortium of cooperatives representing all the 10 districts of the Copperbelt province;
- ii. Women in Mining; and
- iii. Community hosting the black mountain.

Fellow citizens, We promised the people of the Copperbelt better circumstances where they will have access to support that will enable them to be active participants in the mining sector.

We are pleased to announce that contracts have since been signed between the beneficiaries and the

identified mining operators with the necessary equipment and qualified staff who have already undergone safety training.

We promised to assist our people by enabling access to markets and in doing so, ten different companies have been identified as off-takers of the material from the black mountain. Youth and women cooperatives will soon realise monetary benefits from the mineral sales that they will have complete control over.

Further, in order to support specific youth groups, a revolving fund has been created under the district commissioner's office and a committee has since been formed to manage the fund with strict fund management and accountability guidelines.

By products from the production process will be used for the production of concrete and pavers for townships roads.

Fellow citizens, you can be assured of our care for the welfare of our people and know that the change that you voted for will bring about better days for you and your families.

God bless you and god bless Zambia. I thank you."

Hakainde Hichilema

President of the Republic of Zambia

CONGO'S GAS MASTER PLAN PROMISES TO EXPAND EXPORT OPPORTUNITIES AND DOMESTIC DEVELOPMENT

In a bid to optimize the country's gas potential and revitalize its hydrocarbons sector, the Congo has put together and launched, at the end of 2021, a plan to put its estimated 10 trillion cubic feet of natural gas reserves to good use. The new Gas Master Plan (GMP) is designed to promote gas utilization and attract foreign direct investment, while reducing its dependency on oil revenues and expanding the country's power grid.

Developed by the Ministry of Hydrocarbons and Wood Mackenzie, guided by Société Nationale des Pétroles du Congo (SNPC), the GMP is a road map to the Congo's natural gas future both for domestic consumption as well as exports.

For exports in particular, the government sees small-scale Floating Liquefied Natural Gas (FLNG) as optimal, specifying Eni's Marine XII field as a prime target for this solution. FLNG however, particularly at a small scale, doesn't come cheap, and changes to the country's current fiscal terms will need to be updated for these projects to be viable.

Anticipating such challenges, the plan opens the door to renegotiating existing contracts and even suggests the establishment of a whole new Natural Gas Policy designed to facilitate the commercialization of stranded and flared natural gas, calling for operators like Eni and TotalEnergies to come to

the table to discuss what terms will be optimal for the sector's development.

On the domestic front, however, the Congo is much more advanced than most of its neighbors, having one of the very few large-scale gas-to-power projects in the region. The Central Électrique du Congo, fed by ENI's Marine XII offshore block, currently produces nearly 70% of the country's electricity, and stands as a grand example of what its power generation future can look like.

However, adjustments to pricing systems and transport infrastructure development will certainly be needed for that future to come through. Ensuring fairness and competitiveness in the domestic natural gas market still represents a major hurdle for both buyers and sellers, but the plan expects that a novel pricing aggregator system ensuring price stability could limit those challenges.

As natural gas takes its rightful place at the center of the Congo's energy future, the GMP and other strategies will be under the spotlight at the first-ever Congo International Energy Summit (CIES), taking place in Brazzaville on the 15th – 17th of June 2022. The CIES will reunite regional and international government representatives and industry leaders to discuss the future role of natural gas as a regional and continental solution to address energy poverty, among many other issues.

ZAMBIA THE STAND-OUT PLAYER IN AFRICAN MINERAL EXPLORATION FOR 2022: EXPERTS

All eyes are on Zambia," says Peter Major, director of mining at Mergence Corporate Solutions in South Africa. Major spoke in Cape Town in October as he prepared for a mining investment trip to Zambia. In the new president, Hakainde Hichilema, he says, the country has "a real businessman" in charge.

With billions of dollars worth of African gas, gold, copper and cobalt to hit the markets in 2022, industry players are focused on the next big deals. The election of a new government in Zambia in August 2021 has led to optimism that the country is the stand-out player in African minerals exploration for 2022.

As well as copper, whose industrial mining in Zambia dates back to the 1930s, the country has significant potential in gold, manganese, emeralds and coal, Major says. There has been a historic lack of exploration since the post-independence nationalisation of the mines, he says. Over the past five years, in particular, there has been "no motivation to prospect".

A working cadastral system gives Zambia a crucial advantage over Ghana and the Democratic Republic of Congo, Major points out. But the question mark over the Hichilema administration is how it will handle its review of existing mining licences. "We need to see some people coming out of the other side of the pipeline," Major says. Once that starts happening, he predicts, there will be a "stampede" to explore and mine in Zambia.

According to Irmgard Erasmus, a senior financial economist at Oxford Economics in Cape Town, Hichilema and his minister of mines, Paul Kabuswe, are likely to take a "more pragmatic, market-orientated approach" in dealing with mining companies, in contrast to the "hard-handed and interventionist stance" under the former president, Edgar Lungu. The Zambia Chamber of Mines has welcomed plans to reform the tax code, saying this will mark a break from the old "cash-grab mentality".

Mining was the only sector of the Zambian economy to decline in the second quarter of 2021, when copper production dropped 9%, hurt by the impact of Covid-19 and the first-quarter rainy season. This meant the country was unable to fully capitalise on the high copper prices, which peaked in May, according to economist Yvonne Mhango at Renaissance Capital.

Erasmus predicts that copper prices going forward will see a moderate but sustained decline, amplified by monetary policy normalisation in the US and the risk of a Chinese slowdown driven by stresses in the country's property sector. These headwinds, Erasmus argues, will ensure that Hichilema will remain "mindful of the urgency to strengthen copper output".

Major contrasts the Zambian outlook with that in South Africa. He is critical of President Cyril Ramaphosa's cautious approach. Hichilema has shown a willingness to purge figures associated with the old regime, Major says: "Purging is necessary. But

Ramaphosa does not purge. He promotes. South Africa needs a radical change in governance. Zambia is showing South Africa the way."

Ghana overtook South Africa as the continent's largest gold producer in 2019. Major sees little chance of that being reversed. Ghana's government "acknowledges the problems and takes steps to help the industry," Major says, citing its efforts to keep AngloGold Ashanti in the country.

In 2016, AngloGold's head of corporate affairs, John Owusu, was killed during a riot by artisanal miners at the company's Obuasi mine, but AngloGold has stuck with the project. "There is not more gold in Ghana than in South Africa, but there is a better legal framework," Major says.

Ghana is scored 69 out of 100 in a 2021 ranking from the Natural Resource Governance Institute (NGRI) – an improvement of 13 points since 2017. Governance of taxation has improved, mostly due to the power of the Ghana Revenue Authority to audit all businesses, including mining companies. On adherence to environmental and social impacts, Ghana scored a maximum 100 on the NGRI index, with all gold-mining companies now disclosing environmental and social impact assessments and environmental mitigation plans for new projects.

National budgeting governance has improved due to the adoption of, and adherence to, fiscal rules, the NGRI says. Still, the report claims the extractives sector is being held back by a lack of online data portals, and weak adherence to open data standards. The government currently has no policy in place to publicly disclose mining sector contracts, though there are mandatory contract disclosures in the oil and gas sector.

Sulemanu Koney, CEO of the Ghana Chamber of Mines, is confident that Ghana's mining sector can drive the country's industrial development. For that, he argues, Ghana needs to move up the value chain and start to refine its raw materials. He wants to end the use of imported rubber for mining components and is in discussions with a multinational company to refine Ghanaian rubber.

"Extractive industries can't be a silo or an enclave," says Koney, a chemical engineer by training. "Deliberate thinking is needed to link themes up." An example, Koney says, is the extraction of caustic soda from brine, which is used by the mining industry as well as in aluminium production and in detergents.

Ghana, Koney argues, needs a "minerals-based industrialisation strategy". The challenge, he says, is to "leverage the presence of the mining industry for the good of the country" by promoting training and investment in technology. "That's my *raison d'être*. Otherwise I would have given up a long time ago."

In Mozambique, the coming year will be crucial in consolidating progress against the radical Islamic

insurgency in the north of the country, which has delayed plans to develop the region's natural gas resources. Progress in combating the insurgency means that "sentiment has changed quite drastically" for the better in recent months, says Hermano Juvane, head of oil, gas and value-chain banking at Absa Bank in Mozambique.

Support for Mozambique's army, including from Rwanda and the Southern African Development Community, has contributed to the improvement, Juvane says. People have been able to return home to Palma in the northern Cabo Delgado province.

TotalEnergies in September announced a two-year delay to the first onshore production of liquefied natural gas in Mozambique, with the first output now scheduled for 2026. TotalEnergies declared force majeure at its \$15bn project in April, but project activity is now expected to restart in 2022. Juvane sees the new timetable as realistic. "There is about four years of work left," he says.

Absa in Mozambique is focusing on financing subcontractors of the extractive industries, Juvane says. He sees opportunities for Mozambique in heavy sands, titanium, coal, lithium, graphite, aluminium and rubies.

Extracting the rare earth minerals, a set of 17 metallic elements used for high-tech applications such as cell phones, computer hard drives and electric vehicles, maybe an African industry of the future. China dominates the global supply of rare earths with an estimated share of 85%-90%, but Covid-19 and US-China tensions have sharpened the need for the world to find non-Chinese sources.

"The US is trying desperately not to buy rare earth from China," Simon Gardner-Bond, chief technical officer at Dublin-based TechMet, told a briefing in October. "The whole world is becoming increasingly nervous about China controlling the supply chain."

TechMet invests in projects to develop critical metals for the transition to renewable energy and counts Rainbow Rare Earths among its investments. Rainbow, which is listed on London's alternative investment market AIM, holds Africa's only working rare earths mine at Gakara in Burundi.

But Burundi's government in April halted production because it wants to renegotiate the mining convention, and meetings between Rainbow CEO George Bennett and President Évariste Ndayishimiye have so far not resolved the issue.

Rainbow is also planning to produce rare earths from gypsum stacks generated by hard-rock phosphate mining near Phalaborwa in South Africa's Limpopo province and is exploring the economic viability of possible rare-earth deposits in northern Zimbabwe. Bennett is still confident agreement with Burundi can be reached. "There will be some give and take," he says. "We will come up with a win-win solution."

TRIGON PRODUCES FIRST CONCENTRATE AT KOMBAT MINE IN NAMIBIA

Trigon Metals (TSXV: TM) has succeeded in restarting copper and silver concentrate production at the Kombat mine in Namibia, placing the project on track to meet commercial production targets by March.

The restarted plant is expected to produce 4,000 tonnes of copper concentrate in 2022, and the achievement represents a significant de-risking of the mine.

“A functioning mill is the primary technical hurdle in a mine’s operation, and that hurdle has been overcome at Kombat,” CEO Jed Richardson said in a news release.

Teams worked through the holiday period to complete the install of filter presses and run ore through the full production process to achieve this milestone on time, the company said.

The concentrate produced exceeded management expectations, demonstrating the combination of new equipment from Xinhai and refurbished

equipment from the former operation were operating well.

The feed material for this initial production was said to entail sub-optimal lower grade ore, while grind size, residence times and reagent use were optimized. The mill achieved “satisfactory” grades approaching 20% copper and over 600 grams per tonne silver, “well ahead of expectation at this stage of start-up,” said Richardson.

Production continues, building up to first concentrate shipments toward the end of January.

In September 2021, Trigon announced a new Kombat mineral resource of 39.1 million tonnes (including inferred resources), up more than 450% from the 7 million tonnes previously calculated in 2018.

The Kombat mine, located in the Otavi Mountain region, is a historical mine that operated from 1962 to 2008, during which it produced 12.46 million tonnes of ore grading 2.6% copper.

Sprott-backed (20%) Trigon recently expanded its project portfolio by acquiring the Silver Hill copper-silver project in Morocco.

Namibia also has the Tsumeb smelter, operated by Dundee Precious Metals (TSX: DPM). Tsumeb is expected to be at or below the low end of the guidance range of 200,000-220,000 tonnes for 2021.

According to Fitch Solutions, the start of production coincides with a bleaker outlook for copper prices in 2022, which retains a bearish outlook for the metal’s price trajectory. It expects average copper prices to moderate from \$9,285 per tonne in 2021 to \$9,200 per tonne this year and \$8,700 per tonne in 2023, before further tapering to \$8,400 per tonne in 2025.

At C45.5c per share, Trigon equities trading in Toronto is up more than 22% over the past 12 months, capitalizing it at C\$71.4 million (\$56m).

WORLD- THE SALE OF ELECTRIC CARS DOUBLES IN 2021 TO REACH 6.6 MILLION PIECES SOLD AGAINST 3 MILLION IN 2020 (IEA)

Data from the International Energy Agency (IEA) released at the end of January 2022 indicated that automakers sold 6.6 million electric cars in 2021 compared to 3 million the previous year, double the sale of the latter.

The uptrend is set to continue into 2022 and beyond as one auto industry giant after another announces multi-year plans to go all-electric.

This table reflects the start of the electric vehicle boom announced several years ago. Also, a business opportunity in the Democratic Republic of Congo (DRC) because of its potential in mining resources, particularly Cobalt. This mineral is used in the production of electric vehicles to make the batteries for these vehicles.

Note that the Cobalt market has continued to waver. In 2018, the ton of this ore had climbed to 95,500 USD to drop drastically in 2019, a difficult year for this market, at a price of 30,000 USD per ton.

In 2021, prices started to rise again, doubling in one year to reach around USD 70,000 per tonne.

The improvement observed represents good news for the DRC, world leader in the production of Cobalt (70% of the world supply) and holding in its basement the largest known reserves of this strategic metal.



Newly elected President of Zambia to attend Mining Indaba 2022

Restoring confidence in Zambia as a premier mining destination

Investing in African Mining Indaba is pleased to announce that the President of the Republic of Zambia, Hakainde Hichilema has confirmed his attendance at the Investing in African Mining Indaba, taking place in Cape Town from 9 - 12 May 2022.

Newly elected President Hichilema, who was inaugurated in August 2021, has been hailed as an inspiration after he reversed his fortunes – having been imprisoned for 127 days after the 2016 elections he went on to secure a landslide victory in the 2021 polls.

Now the seventh president of Zambia, President Hichilema has pledged to foster a better democracy through respect for the rule of law, restoring order and protecting human rights. He also hopes to restore confidence in the country as a mining investment destination.

Zambia's mining investment climate deteriorated in recent years as the previous administration pursued resource nationalism, leading to damaged relationships with investors and lower levels of investment. According to the the Zambia Extractive Industries Transparency Initiative, mining accounted for 79.5% of Zambia's total exports and nearly 31.4% of government revenues in 2020.

President Hichilema is expected to share his vision of a new dawn for Zambia, in which macroeconomic

stability is restored and sustainable, inclusive economic growth is promoted. Believing that the mining sector can be an important catalyst for national development, his government is looking to significantly increase the production of copper and other minerals so that Zambia can reclaim its place as a leading miner on the continent. To support these ambitions President Hichilema has already introduced a friendlier mining tax regime and made clear his intention to bring stability to the sector, as well as ensuring regulatory fairness and the elimination of obstacles that stand in the way of new investment.

The President believes that stronger relationships – between the government, miners and local communities – will improve equitable growth and help the country to deliver for its citizens.

The Mining Indaba is back in person this year and we are looking at the future, at moving forward. The programme content for 2022 is geared towards exploring the key drivers of investment decisions within the African mining market and forging the future direction of the African mining industry.

The overarching theme: 'Evolution of African Mining: Investing in the Energy Transition, ESG and the Economies' is set to inspire new approaches, spark conversations and encourage partnerships that will truly transform mining on the continent.



OSINO ACQUIRES NAMIBIA GOLD PROJECT FROM B2GOLD FOR \$15.2M

Gold exploration and development company Osino Resources has entered into an agreement to acquire the Ondundu gold exploration property, in Namibia, from TSX-listed B2Gold for \$15.2-million.

The Ondundu gold project is located 250 km northwest of Windhoek.

"We believe this is a highly accretive transaction for Osino, as it provides significant additional scale, diversification and consolidation of Osino's Namibian projects.

"We plan to build on the excellent exploration and resource development work B2Gold completed over the past six years and to quickly advance the project to compliant resource stage," says Osino president and CEO Heye Daun.

"Based on the project's historical exploration and analysis, we believe the project has the type of mineralisation with potential to host a significant openpit gold

resource possibly in the order of more than one-million ounces of contained gold, with the possibility for co-development with Osino's Twin Hills gold project," he adds.

Osino agreed to buy all of the issued and outstanding shares of Namibian company Razorback Gold Mining Company, which owns 100% of the Namibian exclusive prospecting licence 3195, covering 19 969 ha located about 130 km northwest of Osino's Twin Hills project, together with all Ondundu gold project technical information and other books and records in respect thereof.

"The consideration payable is partially deferred and upon closing will result in B2Gold becoming a strategic shareholder of Osino. We are very pleased that B2Gold has agreed to the part-equity structure of the transaction and appreciate B2Gold's implicit vote of confidence in Osino's ability to take Ondundu to the next level," Daun comments.

SANDVIK TRIALS LARGEST CAPACITY ELECTRIC TRUCK

Sweden-based original equipment manufacturer (OEM) Sandvik has unveiled a prototype of the Sandvik TH665B, the world's largest capacity battery-electric truck for underground miners.

The company said the truck has a payload capacity of 65-tonnes and is currently completing factory testing in California, US.

Finalisation of the trial agreement with Barmenco and AngloGold Ashanti Australia will see the truck trialled at the Sunrise Dam gold mine to "prove its viability in a long ramp application." Commercial production of the Sandvik is expected to begin in late-2023.

The company said the unveiling is consistent with its battery-electric vehicle (BEV) strategy to include larger and smaller size classes. It claimed that the Sandvik TH665B is "engineered to improve productivity, sustainability and cost-efficiency in bulk mining operations."

It is "up to 30% faster on a 1:7 ramp than a comparable conventional diesel underground truck," and its wheels are equipped with independent drives, which will result in a simpler driveline, improved overall efficiency and maximum power output.

Additionally, it is equipped with Sandvik's self-swapping system and

includes the AutoSwap and AutoConnect functions. These enable "quick and easy" battery swapping "in a matter of minutes."

The company said it has redesigned the battery cage design to "improve serviceability, enabling battery module changes without the need to remove battery packs from the cage for service."

The truck operator cabin "offers premium operator ergonomics with a significant number of adjustment possibilities to facilitate a comfortable operating environment." It includes "joystick steering, large touchscreen colour display" and a control system that provides "easy access to equipment data."

Henrik Ager, president of Sandvik Mining and Rock Solutions, said, "Our 65-tonne battery-electric truck is our latest development in helping mass hard rock miners and contractors to make the shift towards more productive, emission-free mining."

The announcement is the latest underground mining technology Sandvik has released, the most recent being two IM360-B Advanced Equipment Simulators and blended learning products to the Olympias mine in the Halkidiki Peninsula in northern Greece.

EPIROC LAUNCHES MOBIUS FOR DRILLS, A DATA HUB FOR MINE OPERATIONS

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

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

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

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

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

By providing a single platform for all stakeholders within the drilling

operation, users can quickly navigate the information, filter it to their needs and streamline the decision-making process, day-to-day or over time.

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

"Mobius for Drills enhances engagement of all stakeholders with the drilling process. It provides valuable insight at each stage of the drilling process through a drill plan builder for planning, situational awareness for drill controllers and reporting for supervisors. It is a scalable product, which accommodates evolving needs of a mine," explains Mahmood Hassan, Engineering Project Manager – Automation, Epiroc Surface division.

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

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

COMPLETE LIGHTING SOLUTION FOR SOUTH AFRICA'S LONGEST ROAD TUNNEL – BEKA SCHRÉDER

BEKA Schröder is proud to have supplied the LED lighting solution for the Huguenot Tunnel near Paarl, Western Cape. It is South Africa's longest road tunnel. This installation will result in energy, maintenance and cost savings. The upgrade also has positive impact on the safety of road users.

The Huguenot Toll Tunnel provides a route through the Du Toitskloof Mountains which separates Paarl and Worcester. The 3,9km long tunnel was opened in March 1988, and is 11km shorter than the route across the pass. According to the Average Annual Daily Traffic (AADT), more than 12,000 vehicles travel through the tunnel daily.

It was decided to replace and upgrade the tunnel's old fluorescent lighting and control system for the first time since construction. The requirement was for a complete design, supply and installation solution, including a lighting management system.

More than 6,000 LED striplights and more than 200 LED adaptation luminaires were supplied and are managed by the Advanced Tunnel Solution (ATS) control system.

With the upgrade of adaptation luminaires, the adaptation light levels have improved drastically. This eliminates the black-hole effect when approaching the tunnel during bright daylight, much to the benefit of motorists, who are now able to see clearly when entering the tunnel.

Furthermore, overall uniformities across the road surface of more than 85%, and longitudinal uniformities of more than 95%, were achieved. Experience the new lighting installation by viewing this video: <https://youtu.be/v15oocomQYjo>

Lighting to improve visibility with less energy

BEKA Schröder has developed a customised LED striplight, perfectly suited for this tunnel lighting application. This South African designed and manufactured luminaire incorporates the latest LED technology and consists of an aluminium extrusion body and die-cast aluminium endcaps creating the best thermal environment for LEDs. Various light distributions are offered to provide the right amount of light, exactly where it is needed. The request for a continuous line of light throughout the tunnel was achieved with this unique luminaire design.

The right light where, when, and how it is needed

The tunnel is divided into different lighting zones as per CIE88 and shown in Figure 1.

Each tunnel zone requires a different luminance level. The ambient lighting conditions and tunnel entrance as seen by an approaching motorist in the Access Zone is measured by a specialized luminance meter (typically referred to as an L20 camera). The L20 camera provides input to the control system which adjusts the light levels for each zone to follow the CIE curve (as per CIE88). The luminance level at the Threshold Zone is highest at the entrance of the tunnel and then decreases as you move into Transition Zones 1 and 2. Whilst driving through these zones, it gives the eye time to adapt to the lower light levels on the Interior Zone. As this is a bidirectional tunnel, both sides are treated as entrances with L20 measurements controlling the adaptation lighting.

Schröder's advanced luminance calculation software analyses all aspects of a tunnel environment to provide the right luminance level in all tunnel zones. During the study, the number of luminaires to be installed in the tunnel and their orientation are calculated to create a curve as close as possible to the CIE normative curve for an efficient and economical light installation.

An uncompromising quality

Tunnel luminaires are often subject to harsh environments. Vibrations, flying debris, car fumes, water leaks, and electrical surges can damage luminaires. BEKA

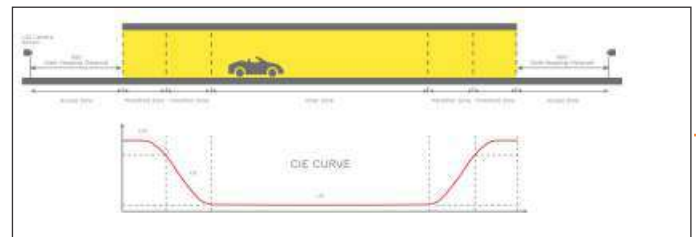


Figure 1: CIE Curve adjusted for bi-directional tunnel traffic.

Schröder's manufacturing processes are rigorously controlled in their facilities to guarantee design excellence. Their products are tested and certified in accredited laboratories to resist these harsh conditions and ensure robustness and quality over time.

ATS control system, the solution for tunnel automation management

The Advanced Tunnel Solution (ATS), a co-development between Schröder and Phoenix Contact, is an all-in-one central control system designed to easily manage all tunnel lighting parameters remotely.

The ATS receives a signal from the L20 cameras installed outside the tunnel at the Safe Stopping Distance (SSD), then communicates with all local controllers installed in the tunnel luminaires. It collects information from the LED drivers, but also from hard input triggers installed inside the tunnel. ATS is also capable of switching between relay circuits to ensure long life of LED and driver components in the luminaire, while saving energy.

This innovative tool is capable of constantly adapting the light levels according to specific tunnel conditions like weather, day mode, night mode, maintenance and emergency sensor inputs. The system also controls the light levels using a constant light output (CLO) function, which takes into consideration lumen and dirt depreciation.

This intelligent system permanently monitors the power consumption and reports any BUS communication or power failures. It integrates the initial tunnel lighting study while the industrial BUS system enables individual auto-addressing, to speed up the commissioning process, saving valuable time and resources during installation.

In addition, a Tunnel Control System (TCS) unit facilitates and manages the communication between multiple ATS devices as well as the seamless upstream exchange of data and commands to a higher (CAN) level system. Complete redundancy was achieved with ATS ensuring a always ready control system.

Conclusion

BEKA Schröder is delighted to have provided the lighting and control solution for this tunnel. The high-efficiency and long lifespan of the luminaires will enable the South African National Roads Agency Limited (SANRAL) to reduce its operating costs while delivering a much better service for commuters. This new lighting installation has not only improved the driving experience for motorists but will also ensure less closures and hold-ups due to maintenance for a more pleasant commute.

BEKA Schröder, leading local manufacturer of LED luminaires, is part of the Schröder Group. BEKA Schröder locally develops and manufactures sustainable LED lighting products, designed and suitable for local conditions.

BEKA Schröder, in partnership with Phoenix Contact, are very proud to be associated with SANRAL, Innovative Transport Solutions and LEAD Engineering Projects in providing a complete lighting solution for this prestigious project.

For further enquiries, contact Riaan Bubb at 021 510 8900 or ct@beka-schreder.co.za.



Look out for
Copperbelt Katanga Mining
 eMagazine & Print,
 May-June Edition
 at this year's
DRC Mining Week
 in Lubumbashi, DRC
 1-3 June 2022



Copperbelt Katanga Mining is one of the leading digital and online news platforms for the mining sectors in the **Democratic Republic of Congo** and **Zambia**. It's accessed by an audience of over 25 000 readers that includes influential mining authorities and key decision makers across the industry.

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GALILEO UPBEAT ON MODELING PROGRESS AT ZAMBIA'S LUANSOBE

Galileo Resources reported progress in the modelling of historic drill data at Luansobe on Tuesday, as well as completion of the second payment to the vendors to secure an initial 75% interest in the Luansobe Copper Project in Zambia.

The AIM-traded firm said "considerable progress" had been made by consultants Addison Mining Services in compiling drill data for 154 holes, drilled between 1921 and 2007, and initial modelling of the deposit.

It said two concurrent development options were being considered, with the first being the potential for a small open pit mine of between three and five million tonnes, to exploit the up-dip portion of the copper deposit in the northwest of the licence area.

The second option was the prospect for a larger mine, to develop the resources down-dip and along strike to the southeast where drill data was more sparse.

It said it was planning to start preparations for shallow mining in the northwest before the end of the year, while undertaking a drilling campaign to confirm historic drill results and to further define a potentially larger resource towards the southeast.

The company said it was making arrangements for the coming week to view drill core believed to be held at the nearby Mopani copper mine, to further increase confidence in the historic drill reports.

At the same time, it confirmed that the second cash and share payment had been made under the joint venture agreement

with the vendor of Luansobe, to secure the initial 75% interest in the project.

"We are pleased with the outcome of the interrogation of historic drill data which indicates good potential for a small open pit in the range of three to five million tonnes of copper ore based on current economics," said chairman and chief executive officer Colin Bird.

"If the modelling continues to be satisfactory, we will prepare for commencement of a small open pit mining operation using third party contractors.

"We are particularly encouraged by the larger potential – we are planning for further drilling in the southeast of the property to test previous suggestions of larger tonnages and grades in excess of 1.5% copper."

The company has already prepared a shortlist of local drilling contractors and intends on pursuing two concurrent development options – a shallower copper oxide mine or a large-scale sulphide resource at depth.

The initial review of the project suggests that potential exists for a large standalone mine since all data suggests that the body is open to depth with considerable strike. We will move aggressively forward with determining the tonnes and grade available for an oxide openpit since this gives us early access to cash flow.

"Reports do not mention cobalt, but the area is known for cobalt and we will be testing previous core for the presence of cobalt, which is becoming an important metal in the battery space," CEO and chairperson Colin Bird comments.



SRK APPOINTS SAMBWA AS DRC CHAIR

Experienced geological consultant, **Dominique Sambwa has been appointed chairman of SRK Consulting Congo, based in Lubumbashi in the Democratic Republic of Congo (DRC).**

Sambwa has 25 years of experience in the minerals sector of the DRC, having joined the SRK Lubumbashi office when it was established over a decade ago. The office now has 14 local professionals and support staff, and is an integral part of SRK's global network of engineers and scientists in over 45 offices.

Sambwa's career began in field exploration, leading him to join state-owned copper and cobalt mine Gécamines in 1998. His role expanded into plant production management, and then into process plant planning and establishment. After returning to the

prospecting field in 2006, he entered consulting in 2008 as the founding managing director of Onyx Consulting, before joining SRK Consulting in 2010.

His work at SRK has included several green-field and brown-field projects around the DRC, Guinea, Tanzania and Zambia. These have focused on various facets aimed at resource estimation, including exploration, quality assurance and quality control compliance, best practice, data management, GIS and project management.

Looking towards the future, Sambwa said an important aspect of his role as chairman was to promote the application of global standards in the field of geological reporting.

"To build a firm foundation for the country's mining sector, it is critical that exploration and

mining data generated by mining operations is accurately reported in line with accepted standards," he said. "SRK will also continue to nurture and mentor local professionals, to help build internal capacity and growth."

Sambwa holds a BSc (Hons) in geology and mineralogy from the University of Lubumbashi, and is a member of the Ordre National des Géologues du Congo and the Southern African Institute of Mining and Metallurgy. He speaks French, English, Swahili and Lingala.

SRK appoints Sambwa as DRC chair 2

Caption: Dominique Sambwa has been appointed chairman of SRK Consulting Congo, based in Lubumbashi in the Democratic Republic of Congo (DRC).

TERTIARY MINERALS RAISES GBP500,000 FOR METAL EXPLORATION IN NEVADA & ZAMBIA

Aim-listed Tertiary Minerals has raised **£500 000 before expenses through a placing of over 294-million new ordinary shares in the company.**

The placing was arranged through the company's joint broker Peterhouse.

The placing shares are expected to be admitted to trading on Aim on or about January 24.

Additionally, Tertiary is making a further 58.8-million new ordinary shares available to provide qualified Tertiary shareholders and other qualified investors with an opportunity to

participate in the fundraising.

The broker option shares are available to qualified shareholders or other qualified investors via Peterhouse and are expected to raise up to £100 000 in additional funding.

The proceeds are to be used to fund drilling and direct exploration activities, including diamond and reverse circulation drilling, trenching, soil sampling survey and geophysics, in Nevada and Zambia, throughout the year.

"The company is entering a very active phase. We have drilling programmes targeting silver

and gold at Pyramid, in Nevada, and copper at Jacks, in Zambia, due to progress in the coming months. This funding strengthens our balance sheet, allowing us to expand our exploration budgets.

"Nevada and Zambia are mining-friendly jurisdictions and are geologically highly prospective. In addition to the planned drilling, we are increasing our activities across the company's portfolio of copper projects at Brunton Pass, in Nevada, and on our newly signed options in Zambia," MD Patrick Cullen says.

BME'S AXXIS TITANIUM™ INITIATES RECORD BLAST IN SA

Another record-breaking blast has been notched up by Omnia Group company BME using its latest generation AXXIS Titanium electronic detonation system.

The blast of 5,209 detonators was conducted recently at a chrome mine in South Africa's North West province, according to Tinus Brits, BME's Global Product Manager – AXXIS. Brits highlighted how the enhanced features of AXXIS Titanium allows mines to respond quickly and easily to raised production demands.

"While a record blast is always an achievement to be celebrated, this was a standard production blast requiring nothing different or extra from the mine," he said. "The ease-of-use of AXXIS Titanium, the speed at which blasts can be prepared, and its rapid testing features make this possible."

The dual voltage basis of the new system means that detonators can be tested while they are logged in, with the logging and

testing conducted as a single function. As a result, this record blast could be primed, charged, tied-up, logged, tested and programmed in just two days.

"With AXXIS Titanium, the logger does everything for you," he said. Multiple loggers were used on the blast, with each operator logging a portion of the blast to speed up the process; the log files are then seamlessly combined.

By consuming less energy, AXXIS Titanium allows up to 1000 detonators to be initiated by each blasting box – reducing the amount of equipment that is needed on site.

"This helps improve the reliability of blasts, as there are fewer items of equipment to communicate with each other," said Brits. "These high levels of reliability ensure a quality blast with no misfires, even in single-prime blasts – where there is just one detonator per hole – as was the case in this record blast."

He also emphasized the intuitive fault-finding capacity of the AXXIS Titanium system, which identifies those detonators which have not been logged onto the harness wire. The operator is informed precisely where the relevant detonator is to be found, so it can be quickly logged.

"It also solves the problem of 'intruders' – those detonators that were accidentally missed during the logging process," he said. "Again, the operator can speedily fix this issue wherever it occurs, ensuring that there are no misfires in the blast."

The unique design of the AXXIS Titanium connector is another important factor, allowing blasters to log and test detonators without the need to open the connector. The gel in the connector that ensures a good seal, therefore is not disturbed during testing and logging.

"It only gets opened up once you connect it to the surface wire, which is why the sealing of our connectors is so good – eradicating resistance or leakage on the block," he said.





40.6 MILLION USD INVESTED IN SUBCONTRACTING, KIBALI MULTIPLIES ITS POSITIVE IMPACT ON LOCAL ECONOMIES IN DRC

A total of 40.6 million us dollars invested by Kibali Gold Mines in the fourth quarter of 2021 with local contractors and suppliers (subcontracting). Which refers to 2.1 billion USD that this mining company has invested from its beginnings until 2021 for its subcontractors, in 12 years.

These revelations are made by Mark Bristow, Chairman and CEO of Barrick during a press conference held on Friday January 21, 2022 at the Memling.

Indeed, 380 subcontractors have benefited from the presence of Kibali since its beginnings in the province of Haut-Uélé.

With its policy of technology transfer and creation of a middle class, Kibali has been able to create new Congolese entrepreneurs who, in turn, employ their compatriots.

As a result, this policy has reduced the unemployment rate, at the same time reducing the renewed insecurity in this part of the country.

“We prioritize hiring and buying local. We build the skills and capacities of workers

and suppliers in host countries to multiply our positive impact on local, regional and national economies,” explained Mark Bristow.

For his part, Cyril Mutombo, DRC Country Director of Barrick praised the capacity building advocated by Kibali.

“We have strengthened the capacity of our subcontractors. These people are diversifying. They don’t just do civil engineering work. They are also in work related to the construction of schools. They are also in heavy work.”, he said.

This diversification of subcontracting has the advantage of boosting the different sectors of the economy of this province.

In catering, some women provide food for the workers of this mining company. Thanks to this activity, they take charge of their homes.

In construction, there is the presence of the company IOB managed by a Congolese who knew how to build a hydroelectric power station.

“IOB is not alone in construction, we also have the presence of TBO, which has among its assets the construction of

several works such as a house, church, schools, etc.”, he said.

In the management of human resources, Didi Mudogo knew how to plant its marks with its company MD Services which manages not only local workers but also expatriates.

Thanks to Kibali, the Managing Director of MD Services had other requests from multinationals. Thus, he invites Congolese subcontracting companies to be more meticulous.

The Uélé Motors group, for its part, specializes in the maintenance of vehicles and motorized machinery throughout the site.

On the other hand, ALUZA, whose CEO (Ibrahim Enoko) is from Aru, oversees professional watering at mining sites to avoid accidents. This company was born thanks to the technology transfer policy.

Kibali’s policy of using local labor responds favorably to the recommendations of the Regulatory Authority for subcontracting in the private sector (ARSP). And this, for the benefit of the Congolese.



FIRST QUANTUM ADDS GM LEADER DEVELOPMENT PROGRAMME TO ZAMBIA INITIATIVES

TSX-listed First Quantum Minerals has embarked on a new GM Leadership Development Programme in Zambia to mould talented staff into capable leaders.

This is expected to build on the success of the mining company's CEO training programme that saw seven talented employees receive mentorship and training in senior management roles to drive long-term sustainable growth.

"Twenty years ago, First Quantum had copper output of about 10 000 t/y and, as of 2020, we are producing more than 779 000 t, which shows the rapid rate at which we are growing. What has also become clear over the years is that we cannot maintain this growth without having a steady pipeline of leaders to underpin this growth," says First Quantum Kansanshi Mining GM Anthony Mukutuma.

First Quantum started leadership training four years ago with the CEO training programme, which ran concurrently with other initiatives like the secondary school and university scholarships programmes and skills training in partnership with the Trade School in Solwezi and other training providers.

"However, these initiatives only give us the skills and trades we need in practical fields, and we need to get new leaders and managers to run the business," Mukutuma said.

"Our approach has always been to primarily look within for people we can develop into ready leaders to support the forecast growth. Our goal is to ensure that as we grow, we have capable leaders to grow with us," he said.

GM DEVELOPMENT

During the selection process for the GM

Leadership Development Programme, department heads and team leaders recommend five to six people from their teams who displayed exceptional specialist skills and commitment in their area of expertise. The prospective trainees were then put through a series of psychometric and cognitive tests by an independent third party to ensure candidates are selected on merit.

"The nomination happens at all levels so that no talent is missed. From an initial shortlist of 40 candidates, we ended up with six individuals who were admitted into the training programme. After a few months of training, we have seen significant growth in the trainees, in the way they are applying themselves in their current roles and in how they are interacting within their teams and with other stakeholders. This shows the value of the training," he said.

First Quantum partnered with leadership trainers FranklinCovey to facilitate the training, with influential leaders within the company, including the GM himself, spearheading the mentorship part of the programme.

Plans for the next cohort GMs are already in place to continue developing leaders. In the First Quantum way, learnings from the maiden initiative will be taken on board to improve the programme, the company said.

First Quantum Blasting and Technical Services senior mining engineer Samson Mutema added that there was a need for more companies to invest in upskilling their employees and allow them to reach their full potential.

"Most of the time when you are being promoted into a new role you are moved based

on your technical abilities. But few people are taken through the process of changing the way they work. In a leadership role, it is not just about your abilities, but also about the relationship you have with your team and how you can bring out the best in them.

"Through the GM training programme, I have learned how to better engage with my direct reports and other colleagues and find common ground in our individual work philosophies to optimise operations," he said.

Programme participant Masida Gondwe, who is an information and communications development and integration specialist, said the programme had helped her gain the confidence to try innovative solutions to various operational problems the mine may face.

"The training has helped me embrace First Quantum's Bolder, Smarter, Driven, Together core values in my everyday tasks. I am now bold enough to introduce new approaches to how certain departments operate and overcome challenges thereby helping to improve the company's efficiency," she said.

First Quantum human resource specialist Ethel Chasha-Cruz, also a trainee under the programme, noted that such programmes played an invaluable role in building a rich reserve of capable leaders in the Zambian labour pool.

"One of the key focus areas for the training is how honest introspection can help one form more meaningful partnerships with their team-mates. Thanks to the training, I am now able to work on the most critical parts of myself that would otherwise affect my relationship with my team," she said.



贺蓝晓科技如瓦西提钴项目开车成功

Congratulations of the successful commissioning of the Sunresin's Ruashi Cobalt Line

SUNRESIN'S RUASHI COBALT EXTRACTION PROJECT STARTED UP IN DR CONGO

On December 30, 2021, good news came from the Democratic Republic of Congo in Central Africa. The Ruashi cobalt extraction project undertaken and fully operated by Sunresin was officially put into production and successfully produced the first batch of cobalt products. From project design, skid manufacturing to construction of the plant, equipment installation, on-site and remote commissioning, Sunresin takes charge of the project in a one-stop-shop fashion. The successful commissioning of the project marks a big step for Sunresin, in the spirit of innovation, to carry out comprehensive overseas EPC projects in hydrometallurgy, by overcoming numerous difficulties at this challenging time. It also demonstrates the company's potential in the cobalt extraction market in Africa and the international market, as well as in the field of hydrometallurgy as a whole, after some successful large-scale projects of lithium extraction from salt brine.

For the Ruashi cobalt extraction project, Sunresin engineers arrived on site in June 2021 to start civil construction, which was completed and put into production in December. In the project, Sunresin designed, constructed, and operated independently from the scratch. During the implementation period, the team overcame various challenges such as unfamiliar living conditions, language barriers, cultural differences, as well as the impact of the pandemic, to finally realize the successful commissioning and operation of the cobalt extraction production line.

As a rare metal with high energy density, cobalt is an important element of ternary batteries. With the rapid development of the Electric Vehicles industry, the supply-demand relationship of cobalt has been tight for a long time. Congo (DRC) is a cobalt-rich

country with its output accounting for up to 70% of the global output. The successful industrialization of this cobalt extraction project will lead to an increase in the supply of cobalt, thus contributing to the sustainable development of the new energy industry.

Sunresin's Ruashi project features the extraction of cobalt from the precipitation liquor of cobalt hydroxide. The project included a collaborative effort with Sunresin's Remote Solution Operation and Monitoring Center (RESOM) in Xi'an, an innovative initiative put in place during the lockdown period in 2020 to serve domestic and international EPC projects.

With its patented Simulated Moving Bed (SMB) technology for continuous ion exchange, as well as the selective cobalt adsorption materials, Sunresin has managed to increase the concentration of cobalt ions in the precipitation liquor from 0.1g/L to 20g/L, making the original mother liquor with little value a new source of cobalt supply. The successful implementation of this project will add more than 300 tons of cobalt products per annum to the Jinchuan Ruashi project, thereby realizing an annual income of tens of millions of dollars.

Sunresin's complete solution for cobalt extraction is a first-timer application in the field of cobalt extraction. Not only was it the first successful large-scale industrialization project in Congo (DRC), it also helped to broaden the application range of the adsorption technology in the whole new energy sector. Taking the Ruashi project as a starting point, Sunresin will learn from the project, lean on its cutting-edge technologies, and replicate the experience to other projects of cobalt extraction and provide better solutions on a larger scale.



LITHIUM BATTERY MANUFACTURERS RACE TO DEVELOP LOW-EMISSION HEAVY EQUIPMENT FOR MINING

The mining industry globally is expanding, which makes getting to net zero emissions in the next decade unlikely at best.

But one small company in Newcastle is hoping to make a difference by developing big battery systems for heavy equipment.

Heavy vehicle battery manufacturer 3ME says the appetite for a low-emissions mining industry is high.

The fledgling company, which started with just three staff in 2018 and has 55 today, is looking to grow with recent investments and federal grants combining to nearly \$25 million.

The company produces a lithium-ion battery system, made up of a series of blades, each with two cells and a circuit board, which is monitored remotely for potential faults and can be serviced and replaced individually.

The batteries are being trialled in 20-tonne loaders, but the company has begun scaling up to produce hundreds of loaders in the next few years and has begun work on systems for bigger trucks.

GLOBAL PUSH TO CUT EMISSIONS

3ME chief executive Justin Bain, who has recently returned from a minerals policy and investment summit in Saudi Arabia, said the global shift to cut emissions was evident.

Bladevolt batteries for electric vehicles in mining

3ME has designed batteries specifically for heavy equipment in the mining and defence

industries. (Supplied: 3ME)

"I'm really feeling the global momentum ... and I think there's huge opportunity to make significant reductions over the next five years," Mr Bain said.

An Australian Renewable Energy Agency (ARENA) report from 2017 found up to 41 per cent of total mine site energy usage was consumed by diesel-powered mining vehicles, so if the vehicles could become electric, emissions would reduce significantly.

3ME has made the shortlist of the Charge On Innovation Challenge, a project supported by BHP, Rio Tinto and Vale to fast-track ways to electrify large-haul trucks in open-pit mines.

Christine Gibbs-Stewart from Austmine, which represents the Australian mining equipment, technology and services sector, said the global program involving 20 mining companies and 300 suppliers was an important step forward.

"Never before have the big miners worked together in such a manner."

An electric vehicle at the opening of an underground mine with staff around.

Electric vehicles will make conditions underground quieter with less dust and diesel pollution.

REGULATIONS DRIVE CHANGE

Mining uses 3 per cent of the world's electricity — half of that to break up rocks.

As renewable power makes energy cheaper and electric vehicles become more common, shifting to electric equipment to crush, move materials and process minerals will become more cost-efficient.

Mining engineer and consultant Peter Harrop said the industry's pace of change was also due to the push by government regulations.

"They are getting a legal push and it's getting tougher and tougher, and you have a big pull, where there are more and more government grants," he said.

Mr Bain said in the end it would save miners money to make the change.

"The data is coming together to show it can be more productive. We can lower the cost of maintenance and achieve that lower total cost of ownership."

PACE OF CHANGE NOT FAST ENOUGH

There are 500,000 mines sites across the world, including 1,000 big ones, and they are going deeper underground and offshore to find the minerals the world needs.

It has become more dangerous to operate in those environments, so electric mining equipment of all kinds, much of it automated, has benefits.

Dr Harrop believes hydrogen will replace diesel in heavy industry in the next 10 years, but he said miners were moving too slowly, choosing to wait until current equipment wore out before upgrading.

"I don't want to be flippant but all the equipment is there ... just buy it!

"Hitachi has big battery electric excavators, Liebherr in Germany has concrete trucks that are battery electric, Caterpillar and Komatsu are doing superb work, and Sandvik of Sweden has a complete range for deep mines."

20t electric loader for mining industry

Many companies around the world are working on electrifying mining equipment.

CAN MINERS GET TO NET ZERO IN TIME?

Dr Harrop is not the only one who thinks Australia will struggle to meet its carbon emissions goal.

Jan Kwak

Jan Kwak wants mining companies to stop investing in carbon capture and storage.

Jan Kwak, managing director at global civil engineering company Hatch, oversees more than 200 projects including Sun Cable's Australia-Asia Power Link, the world's largest solar energy project.

He said Australia needed to radically shift its mindset and begin trialling new technologies.

"As a nation, we're failing to embrace key low-carbon energy solutions, such as hydrogen, hydro schemes — in particular pumped hydro — and nuclear, which can expedite our goals to reduce emissions," he said.

Mr Kwak, who also chairs the Green Hydrogen Consortium, which includes BHP and Fortescue, said major companies were investing in the wrong things.

"Time and again we're seeing companies investing in unrealistic or ineffective solutions such as carbon capture and storage or brown hydrogen developed from coal."

Even the move by major miners to sell their polluting coal mines isn't necessarily helping, according to Mr Kwak.

"Companies that are divesting their thermal coal assets are simply selling them on while the mines continue to operate."





TOP REASONS FOR MINING IN THE LOWER ZAMBEZI NATIONAL PARK – CBU MINING ENGINEERING STUDENTS

For as long as we are disconnected from the land economically, preserving it is not a priority." – Munyumba Mutwale. This statement could not be more consistent with the reality of the matter, especially for a people that are trying to overcome poverty, debt, economic stagnation and underutilization of the abundant resources within the land. What then are we truly "preserving" if preserving and bettering the livelihoods of the people does not come first?

For quite some time now, the issue of mining in the Lower Zambezi National Park has been one that has sparked debates and mixed feelings not only within the nation but amongst a few international observers as well. The aim of this work is to give hindsight over the issue with the prevalence of facts over emotion, to dispel any myths and unfounded concerns from a Mining Engineering perspective and to establish firm reasons why it is justifiable for the mining operation to go ahead. It will therefore be necessary to first get an understanding of a few key terms and background understanding of a few key areas within this topic of discussion.

Mining: The extraction of valuable and economically profitable minerals from the earth's crust.



Lower Zambezi National Park (LZNP) : A national park laying on the north bank of the Zambezi River in Southeastern Zambia covering a total square area of 4092km², ringed by a larger game management area.

Project Background: The Zambian Government had granted a Mining License to Zambezi Resources Limited, an Australian copper exploration and development company, through its subsidiary, Mwembeshi Resources Limited, to mine 245km² of the Lower Zambezi National Park

via open pit mining with its Kanguwui Copper Mine project. After initial stalling of the project with back and forth court procedures, the project is now set to go ahead. The argument will now be solidified with keen focus on the economic, environmental, social, and legal aspects that support our position.

ECONOMIC ASPECT

Even without 100% state ownership of any mine in the land, the mining industry has for years continued to be the backbone of the Zambian economy. Zambia finds itself endowed with numerous mineral deposits that keep the economy of the country alive and set premise for the economic growth. The economic benefits of mining in the LZNP would far outweigh any current or future projected economic benefits of the area in its current function as a National Park. To put it into context (As per IGC 2019 report), the tourism and travel industry contributes about 7% to the GDP with only 1% of this accredited to wildlife-based tourism with an estimated tax revenue of \$39 million only. Additionally, while the tourism and travel industry as a whole employs more people (7.2%), the number of those employed in national parks is minimal and not properly documented, with little to no decent wages, causing the constant staff turnover. In comparison (According to a report by the Extractive Industries Transparency Initiative), mining contributes about 10% to the GDP (10 times more than the wildlife-based tourism) with indirect contributions totaling up to almost half of the GDP, 73% of total exports, 2.4% direct employment with well-remunerated jobs and 27% of government revenue (making it the industry that contributes the most to the overall revenue of the country). Additionally, mining is a powerhouse when it comes to indirect job creation and opportunities through tenders, contracts and so on to local suppliers and businesses. All of this ultimately has a positive impact on the betterment of the lives of Zambians. The profitability of the national park and actual contribution to the economy and ultimately the lives of individuals leaves much to be desired.

What good is tourism if it is seen as a preserve for the elite and wealthy in society and for foreign tourists only? One of the reasons the tourism industry in Zambia has been limping is because local tourism is not promoted. Most facilities are inaccessible and unaffordable for the average Zambian, an impediment to the growth of the industry and a loss of revenue. It is in this regard

that it is commendable to opt for a more economically inclusive establishment that will not only provide decent employment opportunities for the locals but also contribute progressively to the economy of the country as well.

Finally, we all saw how the Covid-19 pandemic brought world economies to their knees and exposed just how fragile some industries are, particularly the tourism industry. Any halt in international travel renders the industry unbeneficial, leading to loss of jobs and unproductivity. Mining on the other hand is a necessity that stands the test of time. With the high demand of copper and rise in copper prices (\$10K/mt), the Kanguwui Copper Project could not have come at a better time.



ENVIRONMENTAL ASPECT

Environmental protection is an essential aspect of any undertaking. There is no operation that is exempt from ensuring that the three components (i.e land, air and water) are looked after and protected. Most of the concerns emanating from this project are to do with environmental concerns of the mining activities that would take place in the LZNP, and understandably so. The LZNP is a natural reserve area, hosting one of Africa's most cherished water bodies, the Zambezi River, and interlinked with other important natural features. It is no secret the the nature of mining, particularly for the kind of mining method in question (surface/open pit mining) causes a lot of environmental disturbance. It is for this reason that mining can not proceed without "Reclamation". A good reclamation plan that satisfies and meets the

demands of competent environmental bodies such as ZEMA is required, one that properly outlines how it will protect the environment and curb the effects of those environmental disturbances through a clearly detailed EIA (Environmental Impact Assessment) and ESIA (Environmental and Social Impact Assessment). A fitting reclamation plan consists of the following but not limited to: (1) Capability of land to support other activities apart from mining, (2) Proposed land use after mining, (3) Detailed description of how post-mining land use will be achieved as well as (4) Green Bond – funds set aside and paid to the government to assure reclamation.

It is important to acknowledge the fact that that only 6% of the 4092km² is set to be mined, this gives a greater likelihood of mining without causing pollution or damage to the protected areas and to achieve reclamation goals comfortably. Additionally, the proposed mining site is placed 40km from the Zambezi River and 35km from the Mana Pools on the Zimbabwean side, there will be no loss of flora or fauna around that area because of the favorable distances. We need to understand that mining and wildlife can safely co-exist – this can be seen from the stocking of wildlife around Kansanshi, Maamba and Kalumbila, which have demonstrated the ability to preserve wildlife and nature. There are a number of mines worldwide that have been established in National Parks (e.g Energy Resources of Australia and Still Water Platinum in the US) so this is not something new, neither should it cause civil unrest. Via the reclamation protocol, it will actually be possible to return the area to a better and more robust National Park with improved road networks after the 25 year+ mine life is exhausted.

Additionally, Zambia has 20 National Parks and 34 Game Management Areas. On top of that 60% of the total land area in Zambia consists of indigenous forests. This abundance of vegetation also provides a hedge against against any emission concerns. It is actually worth noting that Africa as a whole only contributes 3.8% of global emissions, this can be compared to China's 26% as a single contributor alone! From the above, what we are trying to establish is that we can afford to sacrifice part of the LZNP whilst creating jobs, adding economic benefits and protecting the environment.



SOCIAL ASPECT

For any mining company, corporate social responsibility is something that can not be done without. This is the nature of mining. It has a ripple effect onto other areas and ultimately produces

social benefits as well. Mining companies all over Zambia have used their funds to contribute to the development of the nation through the establishment of townships (e.g Kabitaka \$100 million housing project, Kalumbila \$200 million township etc) , hospitals, sports facilities, schools, scholarship opportunities and local empowerment opportunities among many other things. Just to set the record straight, no National Park in Zambia has contributed socially with even a community school or hospital. The tourism industry lacks the ability to competitively cater for the social needs of the average Zambian.



LEGAL ASPECT

Due to the spread of misinformation and politicking around the issue, it was found extremely necessary to outline the legitimacy of this mining project as well as the granting of a Mining License in an area such as a National Park by stating that this is provided for and within the confines of the Laws of the Republic of Zambia. This is catered for in the Mines and Minerals Development Act No. 11 of 2015 under subsections 22 and 52. This is also catered for in The

ZEMA, the Mining License has been justifiably and judiciously given therefore the law needs to be respected.

CONCLUSION

At this point it is believed that the purpose of this work has been achieved by setting the record straight within the 4 main outlined areas, clearing any myths and concerns as well as giving a more clear, positive and true image of this mining project that has faced attempts of having its image distorted through misinformation and mere

politicking. One of the biggest hindrances to progress and development is simply the lack of accurate information. This puts us in a position where we are unable to make decisions from a place of knowledge and end up seeing progressive campaigns as threats. Mining in the Lower Zambezi National Park should go ahead as this will benefit the locals, the economy and the entire country at large. Additionally, with improved mining technologies in the 21st century it is now possible to conductively interface mining and nature conservation without one having to suffer due to the presence of the other.

Mining is the hallmark of civilization. Development and extraction of our God-given resources is what keeps us evolving. Protection of the environment does not equate to leaving things as they are forever. It may seem like a loss when trees are cut down for the creation of solar plants but that loss is immediately countered by the fact that the solar plant will promote the utilization of green energy. Consequently, for any intentional loss caused by mining, there is a gain. Protecting the environment simply relates to doing things sustainably, no country ever developed from keeping jungles intact.

There is always a better way of approaching things. Zambia is a country with unique challenges that require unique solutions. Perhaps the citizenry could focus on more progressive debates and discussions regarding the profitability of the ore bodies within the mine, how it can be maximized and tailored to benefit Zambians more, the legal framework regarding our tax policies, ownership of mines, demanding guarantees and seeking for improvements. It is simply not good enough to call for the halt of this operation without providing adequate and viable solutions.

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Zambia Wildlife Act No. 14 of 2015 under subsections 16 and 30. A Mining License was granted to the firm in accordance with the law and after a successful appeal on the initial withdrawal and after resubmission of a new EISA assessed by



THE UNITED STATES REASSURES SAMA LUKONDE OF THE START OF AMERICAN INVESTMENTS IN DRC THIS YEAR (2022)

Congolese Prime Minister Jean-michel Sama Lukonde has received assurances from white house officials and the US State Department that US investments will start in the Democratic Republic of Congo this year 2022.

Jean-Michel Sama Lukonde Kyenge indeed exchanged with a delegation of American officials, this Friday, January 28, 2022, at the Primature.

The American mission, made up of delegates from the State Department, the White House and the United States Embassy in the DRC, assured the Head of the Congolese Government of the desire of the country of Uncle Sam to invest in the Republic Democratic Republic of the Congo (DRC).

American officials have noted that the United

States is particularly interested in the infrastructure, environment, health and technology sectors.

For Daleep Singh, Deputy National Security Advisor of the United States, who spoke to the press at the end of this exchange, let it be known that the time has come for his country to deepen the collaboration which was started by the two Presidents when they saw each other, in this case Félix-Antoine Tshisekedi Tshilombo and Joe Biden.

According to this American official, the objective of his country is that the sectors in which the United States wants to collaborate with the DRC can positively impact the daily life of the Congolese.

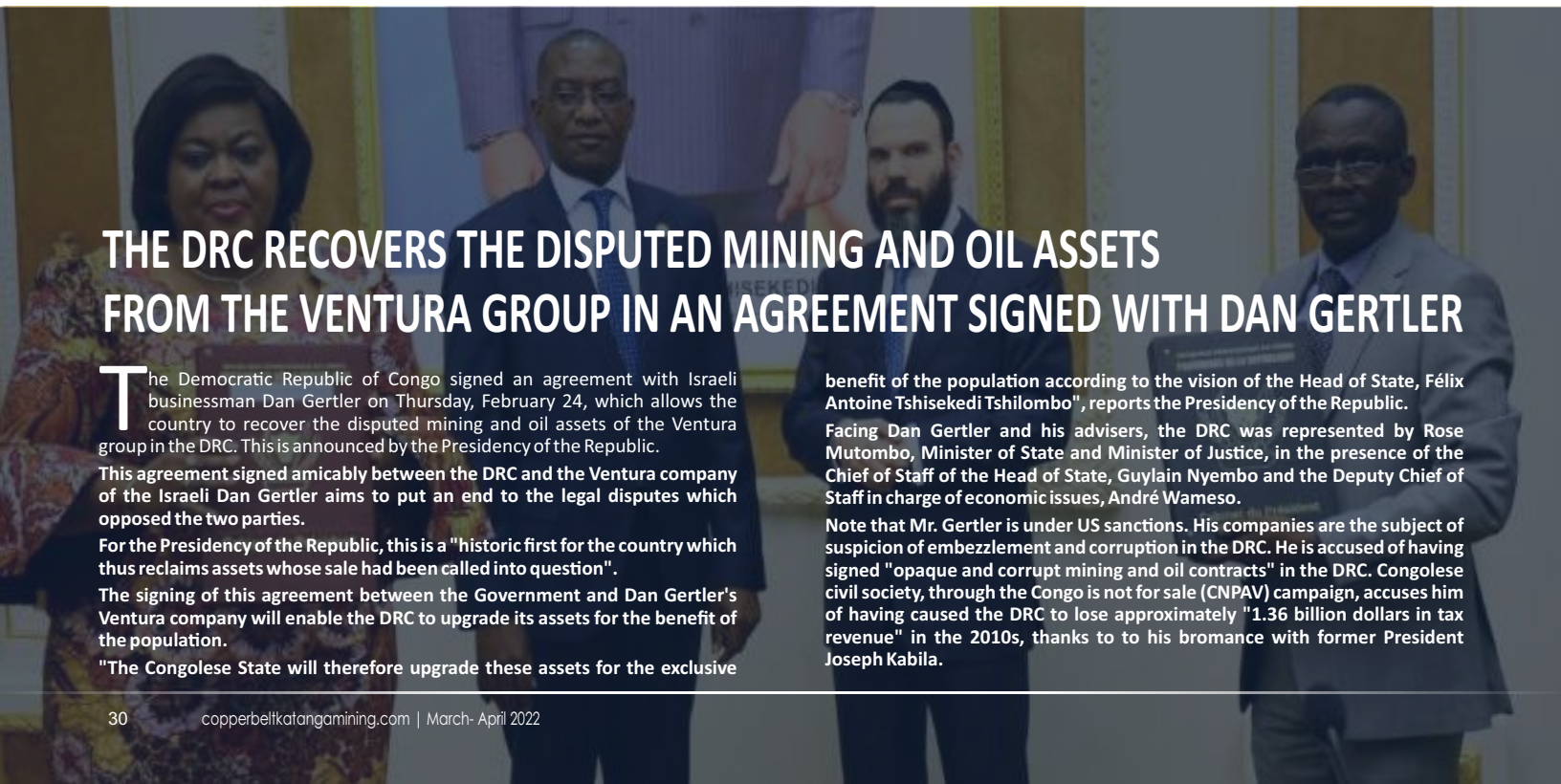
"The infrastructure, environment, health, and technology sectors, in which the United

States wants to collaborate with the DRC, must have a positive impact on the daily lives of Congolese. And that's our goal. And we want to get started this year.", he said.

And to add: "It was important for us to meet the Congolese Head of Government to discuss with him the different angles of this collaboration".

He indicated that the size of this delegation, made up of the State Department, the White House and the United States Embassy in the DRC, sufficiently demonstrates the importance that our country attaches to this collaboration with the DRC.

It should also be noted that Tantalum should experience price stability on the international market for this period.



THE DRC RECOVERS THE DISPUTED MINING AND OIL ASSETS FROM THE VENTURA GROUP IN AN AGREEMENT SIGNED WITH DAN GERTLER

The Democratic Republic of Congo signed an agreement with Israeli businessman Dan Gertler on Thursday, February 24, which allows the country to recover the disputed mining and oil assets of the Ventura group in the DRC. This is announced by the Presidency of the Republic.

This agreement signed amicably between the DRC and the Ventura company of the Israeli Dan Gertler aims to put an end to the legal disputes which opposed the two parties.

For the Presidency of the Republic, this is a "historic first for the country which thus reclaims assets whose sale had been called into question".

The signing of this agreement between the Government and Dan Gertler's Ventura company will enable the DRC to upgrade its assets for the benefit of the population.

"The Congolese State will therefore upgrade these assets for the exclusive

benefit of the population according to the vision of the Head of State, Félix Antoine Tshisekedi Tshilombo", reports the Presidency of the Republic.

Facing Dan Gertler and his advisers, the DRC was represented by Rose Mutombo, Minister of State and Minister of Justice, in the presence of the Chief of Staff of the Head of State, Guylain Nyembo and the Deputy Chief of Staff in charge of economic issues, André Wameso.

Note that Mr. Gertler is under US sanctions. His companies are the subject of suspicion of embezzlement and corruption in the DRC. He is accused of having signed "opaque and corrupt mining and oil contracts" in the DRC. Congolese civil society, through the Congo is not for sale (CNPAV) campaign, accuses him of having caused the DRC to lose approximately "1.36 billion dollars in tax revenue" in the 2010s, thanks to his bromance with former President Joseph Kabila.



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