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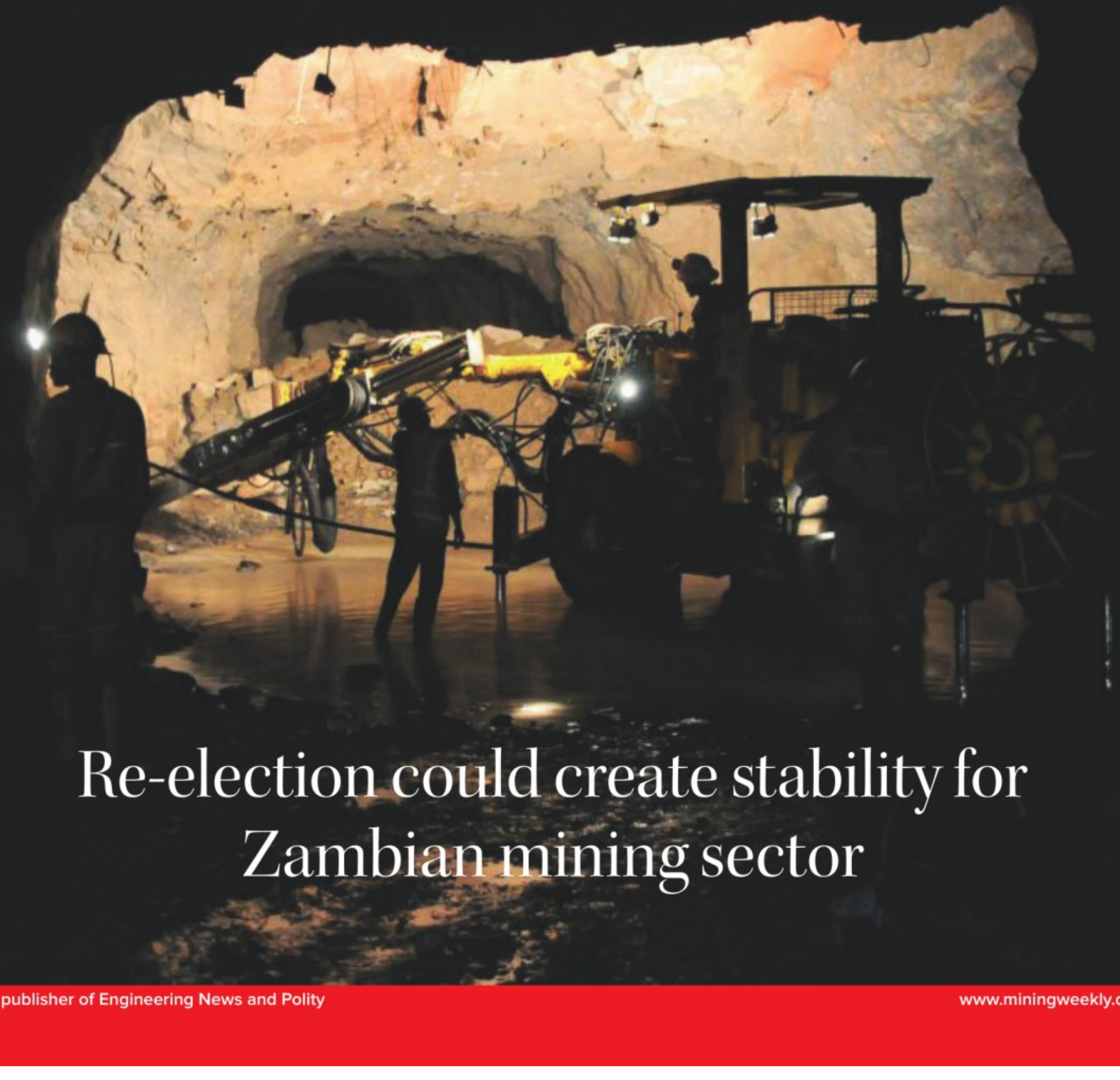

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Re-election could create stability for Zambian mining sector

AARIFAH NOSARKA | CREAMER MEDIA REPORTER

FOCUS DIVERTED
The Zambian government's objectives to diversify the country away from its reliance on copper to improving infrastructure and tourism, among others, did not materialise this year, as the primary focus was on the elections

Zambia's recent electoral results, where more than 50% of votes were in favour of the Patriotic Front (PF), indicate citizens' need for continuity in the country, with the outcome conveying a positive message to investors, global professional services firm KPMG audit partner **Victor Sitabule** tells *Mining Weekly*.

PF leader **Edgar Lungu** was elected President last month, with 100 530 more votes than the United Party for National Development's (UPND's) Presidential candidate **Hakainde Hichilema**. UPND has filed a formal petition in the Constitutional Court challenging Lungu's re-election.

Business community expectations are that policies remain consistent, especially the tax regime for mines – neither want an increase in production costs nor uncertainty as to what they will pay as it affects investment decisions – highlights Sitabule.

He adds that the Zambian government's objectives to diversify the country away from its reliance on copper to improving infrastructure and tourism, among others, did not materialise this year, as the primary focus was on the elections.

However, Sitabule emphasises that "it is time for objectives to be rolled out, it cannot be postponed any longer".

KPMG Zambia tax partner **Michael Phiri** says the uncertain political climate before the elections had delayed investment decisions. "We expect to see more direct investment and fulfilment of pledged foreign direct investment (FDI) in the country following the outcome of the election."

NATHAN CHISHIMBA
The country's mining sector has undergone a lot of changes in recent years

Zambia ZCM president **Nathan Chishimba** tells *Mining Weekly* that the country's mining sector has undergone a lot of changes in recent years, largely driven by a disconnect between policymakers and industry practitioners.

The run-up to elections involved significant progress being made in bridging communication and understanding between policymakers and industry practitioners.

"There is now an appreciation of the need to have a practical approach to a mining policy that serves the mutual interests of investors and government."

Owing to the national elections, Chishimba predicts better engagement between the mining sector and government. A report released by London-based risk management consultancy PGI Intelligence also foresaw a positive outcome for the mining sector.

According to PGI, following several years of regulatory uncertainty and difficult operating conditions in Zambia, the outlook for the mining sector was likely to improve after the election process was finalised.

PGI expected the winning candidate to react to economic pressures to improve the competitiveness of the mining sector by reducing taxes and improving power generation.

"Neither Hichilema nor Lungu is beholden to a particular ideological position – though Lungu has previously backed populist policies to the detriment of the mining sector – and both are under pressure to increase investment in the mining sector, which contributes around 55% of State revenues.

"Falling commodity prices have led to more than 10 000 job losses in the Copperbelt mining hub, which both candidates will be under pressure to resolve," the report explains.

A World Bank overview, updated on April 8, reports that Zambia's economy, highly dependent on the exploitation of the country's copper resources, grew at an average annual rate of 7% from 2010 to 2014.

"However, global headwinds and domestic pressures had strained the Zambian economy. Consequently, growth in 2015 fell to an estimated 3%, compared with 4.9% in 2014, following a six-year low in copper prices, increasing power outages, and El Niño-related poor harvests. Growth is expected to remain about 3% in 2016, subject to the 2016 harvest, the mining industry's reaction to softer copper prices and the stabilisation of the power situation," the overview states.

The World Bank says falling copper prices, exports and FDI have weakened Zambia's economy. Copper prices declined by almost one-third from their peak in February 2011 to $4 595/t in February and are forecast to remain soft until 2018 as global supply currently exceeds demand.

Meanwhile, the Electoral Commission of Zambia announced the 2016 election results four days after voting polls had closed. An estimated 56.54% of votes were cast for this years elections, compared with the 32.36% for the 2014 elections.

Lungu replaced former President **Michal Sata**, who died in office in October 2014, through an election called thereafter, and started his Presidency in January 2015.

Zambia facing challenges, but there is hope

AARIFAH NOSARKA | CREAMER MEDIA REPORTER

Copper-rich Zambia's mining industry challenges, such as a lack of transparency regarding its tax regime, have had significant negative macroeconomic impacts on the country's economy. However, with the implementation of the country's new tax regime, it is hoped that this challenge and others can be overcome, says global professional services firm KPMG.

KPMG Zambia audit partner **Victor Sitabule** tells *Mining Weekly* that the positive sliding-scale mineral royalty tax (MRT) is the result of mining companies' working with the country's government to discuss their tax regime concerns in an open dialogue. Among these companies are Canadian miner Barrick Gold, which operates the Lumwana mine, and London-listed Glencore, which operates Mopani Copper Mines (MCM).

The MRT system was introduced on June 1 and aligns taxes to copper prices. When the copper price is below $4 500/t, mining companies will pay 4% in government royalties. If the copper price is between $4 500/t and $6 000/t, mines will pay a royalty tax of 5% and, if the price is higher than $6 000/t, mines will pay a 6% royalty rate.

"Mining houses had difficulty pursuing operations with the MRT at 9% for opencast mining and 6% for underground mining operations," Sitabule adds. Zambia's mining industry accounts for more than 86% of its foreign direct investment (FDI), with annual fluctuating tax regime levies having negatively impacted on FDI.

Zambia's copper production rose by 8% to 368 371 t in the first six months of this year, from 340 510 t in the same period last year, according to a Reuters report last month.

The report states that full-year copper production in the country is expected to rise by 5.4% to 750 000 t this year, from the 711 515 t produced last year.

Sitabule says investors showed signs of reduced confidence in the continual investment and development of the country. A World Bank report published in April states that Zambia's growth in 2015 fell to an estimated 3%, compared with 4.9% in 2014, following a six-year low in copper prices, increasing power outages and El Niño-related poor harvests.

SUBSTANTIAL IMPACT
Zambia's mining industry accounts for more than 86% of its foreign direct investment

The report explains that growth is expected to remain about 3% this year, subject to the 2016 harvest, the mining industry's reaction to softer copper prices and the stabilisation of the power situation.

Meanwhile, Zambia's State-run power company Zesco's looming power supply deficit, owing to drought, has largely contributed to the decreasing copper production, as restrictions on electricity use are preventing mines from operating at full capacity.

Zambia has been experiencing fluctuating daily power cuts, owing to low water levels at its Kariba dam, since July 2015. This has caused State-owned entity Zambezi River Authority (ZRA) to restrict the water allocation for hydroelectric power generation. Sitabule notes that, in terms of the current load-shedding crisis, Zambia is seeking tenders for the development of solar power projects in the country.

He explains that mines have suspended operations in response to the power supply deficit, shutting down shafts, which has subsequently resulted in employee reductions. Zambia's mines currently have access to about 70% of their required power needs and the short fall is sourced through the Southern African Power Pool (SAPP).

Zesco reported in May that it managed to reduce the power deficit from 1 000 MW to below 500 MW, while South Africa's State-owned power utility Eskom agreed in January to provide as much as 300 MW of off-peak electricity to the country.

"Power sourced from SAPP comes at a high price. The cost of power forms a large part of a mine's production costs, which will further increase if SAPP electricity is used," Sitabule explains. The Zambian government projects that the country's copper production levels will increase by more than one-million tons in the next three to four years if copper prices rebound, although Sitabule says the current power supply challenges makes this projection unlikely.

Opportunities

The first opportunity that Sitabule outlines is global diversified mining and marketing company Glencore's plan to invest $1.1-billion in MCM from 2016 to 2018 to sink three copper mine shafts. This development is expected to increase the mine's life span by an estimated 25 years.

Agriculture is not fully taken advantage of in Zambia, he adds. The country's 2016 budget has dedicated funds to diversify away from mining, thereby lessening Zambia's reliance on this sector.

According to Zambian nonprofit organisation the Agricultural Indaba Policy Research Institute, the 2016 budget for the agriculture sector includes plans to increase areas under irrigation by 5 000 ha, establish additional livestock breeding centres and become self-sufficient in fish production by 2018.

Although Zambia is a landlocked country that imports more than it exports, Sitabule is positive that huge strides will be made in the agriculture sector, as he believes that the country can expand this industry through exports.

Further, the Zambia Development Agency facilitates economic growth and development, with investment licences affording incentives to investors, depending on the sum invested.

Sitabule denotes that incentives such as duty-free taxes have the ability to stimulate investment, in not only agriculture or mining but also the country as a whole.

Energy security key for prosperous copper mines

AARIFAH NOSARKA | CREAMER MEDIA REPORTER

The recent prolonged drought in Zambia, home to an energy-intensive copper mining industry, brings the need for additional and diversified electricity production to the fore, as the country has traditionally relied on the hydropower it produced to generate the bulk of its electricity, mining industry consultancy MSA Group's principal coal consultant **Philip Mostert** tells *Mining Weekly*.

"The July commissioning of the first 150 MW of the 300 MW coal-fired power plant at Maamba collieries is the first step in Zambia's diversification of its energy mix. With the energy-hungry copper mines accounting for half of the electricity demand and the economy, growing at 5% a year for the past ten years, more electricity generation capacity is required," Mostert highlights.

The project at Maamba Collieries Limited (MCL) – Zambia's largest coal mining company – is not yet complete. It comprises the redevelopment of the existing coal mine and the construction of a mine-mouth, coal-fired thermal power station and related infrastructure near the town of Maamba.

The project was the first of its kind in Zambia and is expected to provide a dependable and sustainable baseload power source, which is crucial to the country's energy security.

According to MCL's website, the power plant uses two 510 TPH steam generators with circulating fluidised bed combustion technology, resulting in low emissions of sulphur oxide and nitrogen oxide.

Further aspects include steam generator technology suitable for efficient combustion of low-grade high-ash coal, adequate dust-control facilities at coal handling and transfer systems, and high-efficiency electrostatic precipitators that limit the emission of particulate matter in the flue gases to well below the level permitted as per World Bank norms.

The plant also disposes of ash to fill voids in the mined-out areas and for use by cement plants and brickmaking units. Water is sourced from the Kariba lake, the largest man-made waterbody in the world, and power is evacuated through a 330 kV double-circuit transmission line to the Muzuma substation.

Mining Weekly reported in July that the power station's capacity would be increased to 600 MW in Phase 2, depending on demand.

Mostert highlights that part of the solution to Zambia's energy supply problem is to diversify its electricity mix by incorporating coal-fired power plants.

Zambia currently has two coal mines – the former State-owned MCL mine and the Chinese-owned Maamba Collum coal mine, both in Southern Province.

"Although Zambia has relatively small coal deposits, compared with the vast resources of South Africa, Mozambique and Botswana, the majority of Southern Province's coal deposits are well explored, with large enough blocks available for generally simple exploitation," Mostert adds.

The MSA Group recently completed a review of a thermal coal asset with sufficient near-surface coal, requiring minor beneficiation, to supply a coal-fired power plant for its 25-year life, in Zambia.

Mostert denotes that based on the review study, an independent power producer proposed to construct a 100 MW coal-fired plant in Zambia.

He says further exploration and study work can potentially increase the available coal resource to extend the plant's life. Several of these relatively small-scale coal mine power plant projects are currently in development in Southern Province, with further potential being investigated in Zambia's relatively underexplored Western Province, Mostert adds.

Zambia is Africa's second-largest copper producer after the Democratic Republic of Congo. The MSA Group principal consultant of gold and base metals **Mike Robertson** says the country's mining industry is the mainstay of the economy, accounting for 12% of its gross domestic product, but has been significantly affected by five consecutive years of commodity price declines.

Meanwhile, Export Credit Insurance Corporation (ECIC) South Africa notes that commodities, whether raw or partially processed, are often the most significant exports of developing countries, and revenues obtained from them have an important effect on the economies and living standards in countries.

ECIC chief economist **Tsidiso Disenyana** says these countries, especially those in Africa, derive more than 90% of their export earnings from commodities.

While there have been marked price increases in other base metals since mid-January this year, copper has lagged in this regard, largely owing to supply surpluses forecast to continue for the next year or two.

Disenyana explains that commodity price fluctuations, along with the globalisation of the world economy and increased liberalisation of commodity markets, have led to profound changes that seriously affect the commodity-dependent economies of the developing world.

"Weak commodity prices have a negative impact on economic growth, countries' financial resources and income distribution, and might lead to increased poverty instead of poverty alleviation," he stresses, adding that the opposite also true during times of strong commodity prices.

Robertson highlights that the decline in the copper price has led to delays in project developments and has curtailed production at existing operations in Zambia.

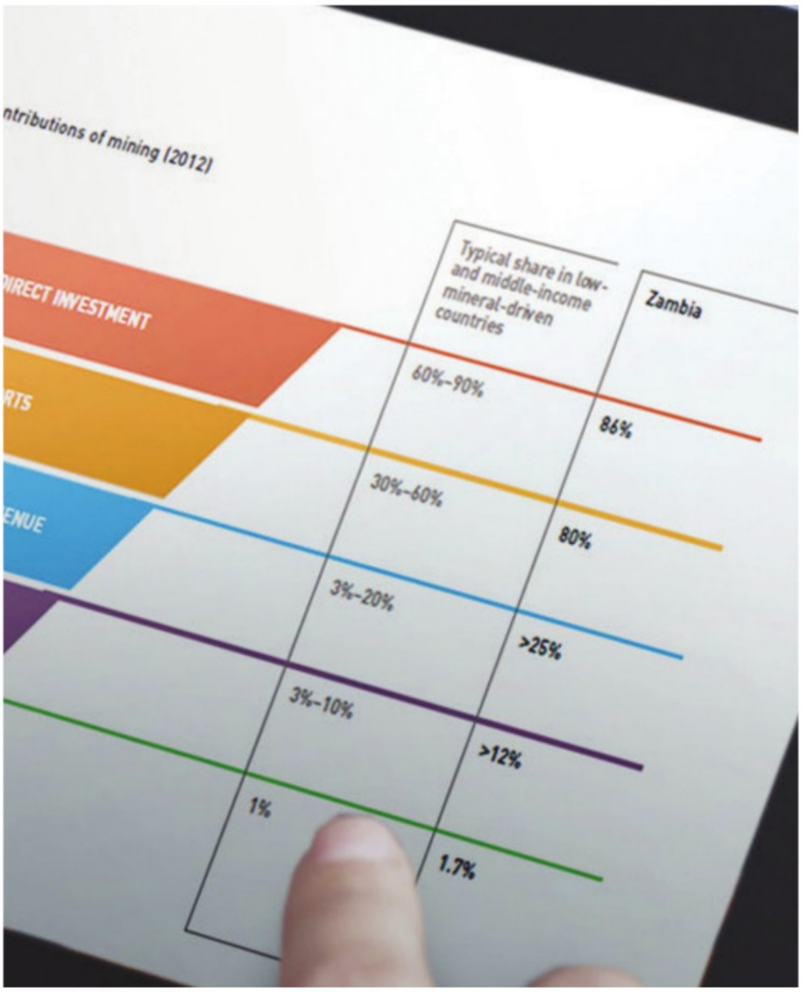
In 2015, some mines in the Copperbelt were placed on care and maintenance on the back of low copper prices, mineral policy uncertainties and electricity supply constraints.

Over the past 15 years, the focus of copper production in Zambia shifted from the traditional Copperbelt, where formal mining has been taking place for almost 100 years, to the North-Western province, where about 70% of Zambia's copper is currently produced by the Kansanshi, Lumwana and Sentinel mines, explains Robertson.

Zambia's 2016 copper production is estimated to be about 700 000 t/y, while output is expected to rise to one-million tons a year in 2018.

Toronto, Canada-headquarterd gold mining company Barrick Gold owns the Lumwana mine, while base metals miner First Quantum Minerals owns the Kansanshi and Sentinel mines.

This year's copper production forecast for Kansanshi is about 235 000 t, 122 000 t to 131 000 t for Lumwana and 135 000 t to 155 000 t for Sentinel.



MINING CONTRIBUTION
Weak commodity prices have a negative impact on economic growth

Sentinel at forefront of global mining technology

Canadian base metals producer First Quantum Minerals' (FQM's) $2.1-billion Sentinel mine, in Zambia's North-Western province, is described by the Zambian (ZCM) as the country's mining industry's "most ambitious venture ever" and the single-largest upfront infrastructure investment in Zambia since the Kariba dam.

It is a blueprint for the future of mining in Zambia by virtue of its technological sophistication, as it has proven that mining a low-grade copper deposit can be economically viable, ZCM outlines.

SOPHISTICATED SENTINEL
The mine employs big drills that allow explosives to be placed at greater depths and 'gigantic' trucks that carry heavier loads

"The Sentinel mine puts Zambia at the forefront of global mining technology," says FQM commercial manager **John Dean**.

He explains that it sets new standards in efficiency, productivity and training, and is a benchmark for future copper mining ventures in Zambia.

The low-grade, openpit Sentinel mine, which started operating in September 2015, is often referred to as the Kalumbila mine, primarily because of the town it gave birth to – Kalumbila.

The mine is currently producing around 150 000 t/y of copper and is expected to reach full production of up to 300 000 t of both concentrate and plated copper in 2017.

Sentinel's ore contains only 0.51% copper, yet the mine is anticipated to produce a long-term return on investment, as it has been designed from scratch, carries no legacy issues and uses sophisticated technology.

Big drill rigs allow explosives to be placed at greater depths, trucks are "gigantic" and carry heavier loads, explains Dean.

The mine's steel-ball mills are considered the world's largest, grinding large quantities of ore, while the conveyor belts carry more material further.

In addition, the mine's semi-mobile rope shovels scoop out 120 t of ore at a time from the pit and can fill a 250 t truck in less than a minute. The operation runs 24/7.

"The openpit resembles a massive amphitheatre where people, machinery and payloads move in a seamless, nonstop dance," comments Dean.

He explains that it is all about speed, efficiency and economies of scale. "The mine would not be viable without this level of technology."

The technology is expensive and requires proper training for effective, safe operation. For example, the drivers of the heavy haul trucks learn their craft in simulators that use virtual reality to replicate real-world conditions.

In one simulator session, for instance, drivers learn to drive in heavy rain and muddy terrain.

As the rain beats down on the windscreen and the truck struggles up a hill, the system records the driver's movements, offers advice through screen prompts and records the driver's score.

The rest of the team is able to watch the session in real time on a bank of computer screens from a room adjacent to the simulator.

All drivers have to do recurrency training every two years.

A refresher course is also needed if they have been away from work for more than one month and when their daily driving reports show too many errors.

SERIOUS COMPETITOR
The Sentinel mine uses some of mining's most advanced technology

Energy Needs

"Sentinel is not just about sophisticated technology. It's also about operations, maintenance, working practices, employee productivity and having access to affordable and reliable energy," notes Dean.

Despite having built nearly 600 km of power lines, energy remains an emotive issue at the Sentinel mine. It has yet to be fully connected to the national grid by Zambia's State-owned power company Zesco. The mine is currently running on a reduced energy supply and needs about 30% more energy to operate at full capacity – especially as most of its sophisticated machinery and equipment uses electric power rather than diesel fuel.

Nevertheless, even at current production levels, Sentinel's contribution to national output confirms the North-Western province's reputation as Zambia's largest copper-producing region. Its three mines – Sentinel, FQM's Kansanshi and Toronto, Canada-headquartered mining company Barrick Gold's Lumwana – together produce nearly 500 000 t/y of copper, which is about 70% of Zambia's yearly production of 711 000 t.

Mine Background

Sentinel's development took five years, with thousands of contractors employed. More than 265 000 t of equipment was transported to the site in 14 500 truckloads.

There was no existing power grid, and the more than 600 km of power lines it erected, run halfway across Zambia to the west of the capital Lusaka.

About 7 000 ha of woodland had to be cleared. However, instead of burning the timber, FQM used it to build a sawmill at which 120 people are employed. The wood is used to make fence poles, furniture and other products and, eventually, timber will be exported.

The Sentinel project consumed prodigious quantities of cement, fuel and food, launched both large and small local businesses, created employment and kick-started an entire local economy.

The town of Kalumbila has more than 5 000 inhabitants, boasts the country's second-longest airstrip and has a bold plan to become a thriving, diversified economy by the time Sentinel reaches the end of its commercial life in 25 years.

"Fifteen years ago, there was no mining industry to speak of in North-Western province.

"Today, several billion dollars of investment later, that has changed completely.
The province has become the new Copperbelt. Sentinel is the most recent example of that shift," Dean concludes.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