MACIG

THE OFFICIAL MINING IN AFRICA COUNTRY INVESTMENT GUIDE

2018

Welcome Note

With this 2018 edition of the Mining in Africa Country Investment Guide (MACIG 2017), Global Business Reports (GBR) and Investing in African Mining Indaba celebrate five years of partnership with the production of our fifth book, which will be released at Mining Indaba 2018 at Cape Town.

Every year, since 2014, GBR has been closely following the developments of the mining industry across Africa. 2014 was not a fortuitous year to begin our enduring relationship with mining in Africa. The continent was then reeling from collapsing commodity prices and a drought in mining investment, as well as the perennial problems that plague the growth of industries and societies across developing nations. Nevertheless, a struggling market does not make it an irrelevant one, and throughout the downturn, GBR continued to travel across the continent gaging the sentiment of those related with the extractives industries, from governments and MNC's, to SME's and mining service providers in order to understand the challenges that they faced and the strategies that they embraced in order to see themselves through the bear market. In MACIG 2017, however, we were delighted to witness the awakening of a more optimistic sentiment as commodity prices started to recover and investors were gradually regaining trust in the mining industry.

The readers of MACIG 2018 will learn directly from the comments contained within that we have gathered from the hundreds of interviewees that we have been privileged to meet during our six-month journeying across the continent in 2017, that the nascent optimistic sentiment that we discovered last year was well-founded. We have encountered a reinforced and keener confidence this year as external conditions, including commodity prices, investment flows and the conditions of the larger economies continue to improve, while the restructuring efforts applied by all mining related companies during the lean-times are now starting to pay off. Indeed, according to the World Bank, six or the top 10 fastest growing economies in the world are to be found in Africa, led by Ghana with an expected GDP growth of 8.3% for 2018. Four of these six are included for study in this book: Ethiopia, Cote d'Ivoire, Senegal and Tanzania, that are expected to grow at 8.2%, 7.2%, 6.9% and 6.8% during 2018 respectively.

While each country in the continent wears its own particular character, it is the same issues that represent paradoxically both the challenges and the opportunities that are either driving or restricting growth in all of them. Principally, these are infrastructure development, power generation, domestic demand, benefication, diversification of industry, climate change, public debt, poverty, social development, and, of course, politics.

These are all perennial issues that will probably never completely disappear but, during 2017, impressive progress was made with many of them, from giant hydro dam construction in Ethiopia and DRC (which we cover in detail this year), to new areas of exploration and crucial political developments. Notable amongst the latter are recent events in Southern Africa which include the ousting of President Mugabe of Zimbabwe (which is included amongst our research) and the election of Cyril Ramaphosa to the presidency of the ANC in South Africa, both of which may eventually engender positive reforms for countries that have suffered economic blight over the past years due to a toxic mixture of mismanagement and corruption. On the other hand, Zambia and Botswana, both of which have their own chapters in the pages that follow, are benefitting from the stable environments that they offer and are well set to benefit from recovering mineral values. Politics will continue to dominate the agenda in Africa during 2018, when elections will be held in DRC, Zimbabwe and Nigeria.

DRC will continue debating a new mining code, and should take note of the revised codes of its Western African neighbors that have bought such success to those nations, including Guinea, for which we have dedicated a chapter this year. We will watch how Tanzania's resource nationalism pans out and we report on how a lack security can be dealt with in our chapter on Mali.

Foreign investment will play a crucial role in resolving all of the factors mentioned above, from infrastructure development, benefication and diversification, to combatting poverty and aiding social development, and the mining industry has a crucial role to play in this process. MACIG 2018 is intended to guide investors across the 10 countries that we have selected this year and to allow them to share the insights that we garneded from the conversations that our team had with the hundreds of protagonists that they met along their way. Their views are scattered across the following pages, along with GBR's own independent analysis, factsheets, expert opinions and geological maps, all intended to help you conduct successful and beneficial business in Africa this year. •

Alex Grose
Managing Director
Investing in African Mining Indaba

Alice Pascoletti
General Manager
Global Business Reports (GBR)

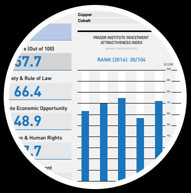
Ministerial Interviews

Featured interviews with ministry officials and government voices from across the continent.

Editorial Content

Updates from the field and analysis on the state of the mining industry in jurisdictions around Africa.

Factsheets



Quick facts and stats that give a quantitative perspective on some of the most interesting destinations for investment in 2018.

Country Maps

Updated geological maps, courtesy of SEMS Exploration, that provide a fascinating glimpse into each featured country's mineral potential.

Expert Opinion Articles

Voices from the industry provide their perspective on different topics and experiences working in Africa.

The Official Mining in Africa Country Investment Guide, 2018

In our fifth year of research to produce the Mining in Africa Country Investment Guide (MACIG), GBR's teams trekked across the continent over a course of six months, exploring destinations never before featured in this report, such as Ethiopia, and revisiting well-established mining jurisdictions such as Zambia. We ventured into places the international community has painted red to understand the reality on the ground in countries like Mali, and we spent time in unpopular locations like South Africa to gain perspective on the challenges the industry is experiencing there. We form the analysis presented in the subsequent pages using quantitative data to support our observations, but the differentiator for this publication stems from our emphasis on qualitative methodologies. In the Internet age, there is an information overload online, and yet it can be challenging for investors to find the intelligence they need to assess the risks and opportunities of entering a market in the African continent. Through hundreds of interviews with business executives, governments, and other leading voices in the mining industry conducted during our time in-country, and with the additional support of informally gathered insights gained through conversations with friends we met along the way, we hope to provide the investment community with an on-the-ground perspective of the destinations we have identified as some of the most intriguing for 2018. And to briefly summarize, what we found is that *Africa is buzzing*.

It is important to note that the continent still houses some of the most impoverished countries on the planet where disease, conflict, inequality and corruption are just some of the many problems that continue to confound both international and domestic development professionals. While some might consider colonialism a relic of the past, the consequences live on and manifest in various problems that will take decades or maybe even centuries to overcome. Furthermore, there is growing concern that a new imperialism has begun to spread across developing regions, although in a different and more subtle form; institutions ranging from Facebook to the Chinese government are all in a race against time to claim their share, whether it be of the rapidly growing consumer markets or yes, the continent's famed natural resources — the latest manifestation of the scramble for Africa.

Nonetheless, *Africa is buzzing*. GDP growth in the subsaharan region had slowed to 1.3% in 2016, but nearly doubled to 2.4% in 2017 and looks to climb to 3.2% this year. A sense of entrepreneurship has taken root and begun to flourish, particularly among the continent's youthful population, which can be perceived through the strengthening health of the SME sector. Invigorated campaigns to unlock the potential of the continent's energy and agricultural sectors have been attracting more investment attention, and of particular significance, the recovering prices of raw materials has analysts projecting rejuvenated flows of global FDI spending towards Africa in 2018, after poor commodity prices had resulted in a perceivable decline in foreign direct investment (FDI) throughout sub-Saharan Africa; in 2017, only US$59.4 billion was spent in the region, representing a 3.5% decrease from 2015.

Despite positive expectations for FDI, as Africa's number-one trade partner and a heavy investor in its infrastructure projects,

AFRICA

Your feet on the ground in Africa

GEOLOGICAL MAP
- Phanerozoic
- Proterozoic
- Archean

MINES
- Precious metals & diamonds
- Other metals
- Coal, iron ore & bauxite
- Other minerals

RESOURCES
- Precious metals & diamonds
- Other metals
- Coal, iron ore & bauxite
- Other minerals

Country Borders
Water area

NORTH

GEOLOGICAL DATA: BRGM - LAT/LONG WGS84
Mine location data: www.mining-atlas.com
Map drafted: Kwaku Owusu-Ansah
Graphic design: Kwaku Owusu-Ansah

2018 – 5th Edition
www.sems-exploration.com

SEMS EXPLORATION | THE AFRICAN GEOLOGICAL CONSULTANCY GROUP

Image courtesy of First Quantum Minerals

China's unexpected slowdown in economic output could have ramifications for the continent despite the positive outlook for commodity prices in 2018. However, global market trends will continue to drive the investment community to the resources that are available in abundance across the continent. The push towards renewable energy and the advent of the lithium ion battery will require greater exploration to meet the demands of manufacturers, and whether it be the DRC's well-known cobalt reserves or Mali's unrecognized potential for lithium, Africa will play a role in the world's more energy-efficient future. In a world that faces increasing political uncertainty, gold will likely continue to provide a safe haven for investment dollars, and initiatives to unlock West Africa's goldfields will flourish. The rapid growth of the human population and a rise of a global middle class, particularly in China, India, and Africa itself, begs urgency to the question of how we will meet new agricultural challenges — Ethiopia's under-explored potash resources will fertilize a new generation.

Against this backdrop, the question that is asked with increasing concern is how the relationship between the various stakeholders across the continent will evolve? And at the heart of this complicated intersection is a diverse and dynamic mining community. It is a community comprised of governments and the private sector, large multinational organizations and small local companies, international investors and African nationals, men and women, geologists and accountants. It is a community often depicted as the bad guys, and sometimes that is a deserved reputation. But the mining community also brings much needed injections of investment and creates new job opportunities. Miners, while sometimes undeniably a detriment to the earth, can also view themselves as stewards of the environment and caretakers of the grounds where they work. Corporate social responsibility (CSR) initiatives on behalf of mining companies have become one of the most significant sources of finance for meeting the needs of local communities, a fact that must be treated with more urgent awareness to promote sustainable and impactful projects. Yet the extractives industry increasingly realizes the necessity of talking to the communities where they operate to better understand how they should respect their obligations to local peoples.

Africa is buzzing, and the mining community plays a critical role in stimulating the vitality we have observed. In the pages that follow, we endeavor to share just a piece of their ever-evolving story in 10 countries that were selected for various reasons, whether it be for their stellar mining potential or their potential to impact the direction of the mining world. We extend our deepest gratitude towards all of those who shared their time and insights with us, and we look forward to continuing that dialogue in the future. •

Peer review and technical audit: Improved assurance for mineral resource and ore reserve estimates and reporting

Mark Noppé
Corporate Consultant
(Geology and Project Evaluation)
SRK Consulting Australasia

Why the need for improved assurance?

Risk is an inherent component of the mining industry and risk governance is an integral part of corporate assurance and business decision making. Similar to the requirements for financial, legal and environmental governance, assurance regarding the processes applied to data collection, estimation and reporting of mineral resources and ore reserves is required. Mineral resources and ore reserves are the key assets of a mining company, and senior management, company boards and external stakeholders require assurance on the accuracy of estimated and reported technical information.

Improved assurance is particularly crucial at a time in the industry when companies are running lean or relying on teams that have limited technical and/ or management oversight experience. Despite industry guidance and some companies having standards expecting or requiring reviews and/ or audits of mineral resource and ore reserve generation and reporting processes, it is surprising how infrequently or ineffectively these are actually carried out.

What seems to be going wrong?

There are many examples where errors and improvements identified after the fact could have been avoided. For example, some errors concern basic data verification and data preparation processes, rather than somewhat more subjective choices about estimation-related parameters. Such issues highlight the lack of experience of the people tasked with the estimation and the lack of adequate internal peer review to identify such issues early.

A common concern is that some companies and managers have not recognised the critical role that peer review plays in improving the skills of individuals and in supporting confidence in the technical outputs. In some cases, while the importance of peer review is formally recognised by companies as part of their standard procedures, there is actually no practical or effective peer review process being carried out.

The importance of people, processes and systems

A balance between the core elements of people, processes and systems is essential for managing the risk and reducing exposure to inaccurate mineral resource and ore reserve generation and reporting. Having competent people following adequate and effective processes, and making use of appropriate systems, will ensure reliable estimates are consistently generated and reported.

What can be done to improve assurance?

All companies large or small, whether publicly listed or not, require some form of quality control and demonstrable assurance to support good governance. The assurance of reliable mineral resource and ore reserve reporting must therefore be included in a mining company's risk management and control framework.

An effective assurance process for the governance of mineral resources and ore reserves consists of three layers of defence; a layer of self-validation and peer review where and when the work is performed; a layer of internal peer review/ oversight; and a final level of independent review or audit that is administered and monitored by appropriately mandated levels of management and/ or board oversight.

Peer reviews are ideally carried out concurrently with the preparation of data, selection of estimation procedures and validation of outputs from mineral resource and ore reserve estimation prior to the handover of results between disciplines, or the final reporting of results. Audits, on the other hand, are generally retrospective reviews by independent and/or external reviewers who rate the risks inherent with an already completed process, identifying opportunities for improvements in the future.

Reviews and audits improve the level of assurance in the reliability of estimated and reported exploration results, mineral resources, ore reserves, and mine reconciliation. Peer reviews and audits contribute not only to governance processes, but also identify valuable improvement opportunities, and provide mentoring and professional development guidance to those whose work is being reviewed.

Conclusion

If a company does not, at a minimum, have a system of internal peer review (as opposed to a formal external assurance process) to provide verification or validation of the actual numbers generated, this lack of internal control may represent a weak link in the assurance of the resource and reserve estimates generated and reported. Indeed, for companies not having an established internal audit function or activity, senior management and/ or the Board should disclose to their stakeholders how adequate assurance on the effectiveness of the company's governance, risk management and control structure will be provided. •

SOUTHERN AFRICA

BOTSWANA - ZAMBIA - ZIMBABWE

"South Africa is not a manufacturing country but a transit point for most industrialized countries. There are handling charges when companies choose to go through South Africa merely to repackage the products before dispatching to the rest of Africa. There is no need for something to land in Johannesburg before coming to Zambia. The days when South Africa was considered as Africa are gone."

- Berry Mwango, Director – C&B Engineering Zambia

Image courtesy of First Quantum Minerals

Southern Africa

A mining revival that depends on the politics.

Long considered a regional and global mining powerhouse, South Africa has been engulfed by a series of political shocks and economic underperformance that have taken a significant toll on its position as Southern Africa's leader in the extractives industry. Amid a backdrop of recession and accusations of corruption, in August 2017 President Jacob Zuma narrowly survived the eighth no-confidence motion held against him in parliament, underlining a country swirling with political dissent. Backed by President Zuma as part of his economic agenda to introduce stricter Black Economic Empowerment (BEE) rules, the new Mining Charter III now requires local mines to be 30% black-owned at all times. South Africa's Chamber of Mines, which represents over 90% of the country's mining companies, has taken the government to court over the matter, and will argue that the charter constitutes an infringement on company law, international agreements and the constitution.

In addition to its political issues, South Africa also faces the challenges associated with an aging mining sector. Industrial mining on the Kaapvaal Craton has been taking place for around 120 years and subsequently, activities in this area now reach depths of over 4,000m. Not only does this present operational challenges, but the hazards of operating in environments where natural rock temperatures reach 50°C and with virgin vertical rock pressures of 100 MPa suggest the enormous risks of operating in South Africa's deep-level mines. "In South Africa, the potential to have the largest impact is really anything that increases the amount of productivity in deep un-derground mines," notes Andrew van Zyl, partner and principal consultant for Mining at SRK SA.

While the opportunity to optimize is always a possibility in South Africa, investors are loath to en-ter a climate with such long-term uncertainty as the country prepares for a protracted period of legal proceedings, halting an already hurting industry. Nonetheless, Johannesburg remains a critical hub for regional operators and improving conditions in the commodity marketplace bode well for the rest of Southern Africa as investors eagerly look to other jurisdictions that boast the region's undeniable shared strengths.

In Namibia, TSX-listed Diamond Fields International was granted a renewal for its license to mine within the nation's 3,700 square miles of marine diamond concessions along its south-west coast. Marine diamonds have surpassed the importance of land diamonds with production total-ing 1.7 million carats from the sea in comparison to 403,000 carats recovered on land. A joint venture between the Government of Namibia and De Beers Group, known as Debmarine Namib-ia, will commence construction on a US$142 million offshore diamond mining vessel to begin op-erations in 2021 to further unlock the potential for sea diamonds. In general, Namibia's economy has recovered substantially following a period of drought that put pressure on its mining and ag-riculture-dependent economy; GDP grew at a rate of 1.6% in 2017 and is expected to double in 2018.

In Mozambique, Mustang Resources secured US$19.95 million in investment from US-based Arena Investors, which will allow the company to advance its high-grade Caula graphite project in the north of the country. Mozambique, which holds some of the world's largest untapped depos-its of both thermal and coking coal, has strong potential for graphite that warrants increased at-tention. Syrah Resources successfully shipped its first production of flake graphite at the tail end of 2017 and will ramp up operations in 2018 with the expectation of producing 160,000 to 180,000 tonnes to fulfill off take agreements in China, India, and Germany.

Madagascar also looks exciting for graphite, with ASX-listed Bass Metals securing a sales agreement for 3,000 mt/y of its flake graphite concentrate and Lithium Australia's spinout Black-Earth Minerals finalizing documentation to list on the ASX, allowing it to seek finance to explore and develop its Ianapera and Maniry graphite assets located in southern Madagascar.

As host to some of the continent's most competitive infrastructure networks, a highly skilled labor force, and mineral deposits ranging from gold to copper and diamonds to coal, Botswana and Zambia remain top destinations for investment, while the political developments in Zimbabwe could position the country for great success as 2018 unfolds. We have thus selected to spotlight these countries in this years edition of MACIG for the Southern African region, and explore these jurisdictions in detail in the pages that follow. •

Hon. Mosebenzi Zwane

Department of Mineral Resources
South Africa

In your presentation to delegates at African Down Under in Perth, you said investors have embraced the new mining charter. Can you elaborate on this?
We have met with both Russian and Chilean investors here in Perth. You probably heard in the morning when the presenter straight after me said we'll come to South Africa, we'll engage you, we want to work with you. Back home we have already signed about five section 11s and two of them (companies) have voluntarily said they want to comply with the charter. As we engage with them (mining companies) they are actually saying, five of them to be exact, that we are not lawmakers, you are lawmakers, we want to do business and we are happy there is certainty. So, we are moving forward, which is a positive aspect of the charter. We are engaging with the remaining members (of the Chamber of Mines) and with the Chamber of Mines itself. They need to come out and say what they don't like. If they say they were not consulted and let's assume that that is true, what is it that if they were consulted they would want to change? We need to deal with the issues and they need to stop running around saying they were not consulted. We have records that prove they were consulted. In fact, they are the most consulted in terms of our records. So, we are there and we are happy and we're moving forward (sic).

How can we expect the relationship between the Ministry and the Chamber of Mines to evolve?
It will be naïve of me to expect that we can present a united front to international investors. You know we differ on the charter. They have their views and we have ours. They will be presenting their views and we respect that. Because we have an open-door policy, the Chamber of Mines is not our enemy, they are our stakeholder and so we remain committed to listening to them and engaging them.

How would you respond to criticism that South Africa is heading down the same path as Tanzania in terms of the legislation it has introduced?
Well, we must respect Tanzania as a mining country. Ours is very simple. We all agree, including the Chamber, that we need to transform. That's what the people of South Africa are saying. This charter is not the first charter, this is the third charter. It means we are not coming up with something that is unheard of. That's why people mustn't say we're going down the same route. No, we are still on the same route we found when we occupied this department. We are not coming up with a very new thing. MPRDA was there, we are just completing it. The charter was supposed to be reviewed in 2014. I came here in 2015 and I've just reviewed what was supposed to be reviewed. So, we are pretty much stable. It's just that people must be able to point out those things they think are a problem so that we can deal with them. We see the future of mining in South Africa as very bright. Investors are going to South Africa as I'm telling you. We're hosting some Russia investors. We will be hosting Chinese investors before the end of the year. So, investors are going to that country irrespective of the new mining charter.

What is your final message about South Africa to our international readership of mining professionals and investors?
It is a noble cause that we should take our people along as we develop. Because of the historical background in Africa, this generation, both investors and government should be able to take into account the people's needs and balance those people's needs with investors needs and that of government and have a win/win solution and that will need courage, honesty from all sides; government, investors and our people. If we leave our people behind we will not have sustainability, prosperity and stability in the sector because people are not happy. So, we are willing to work with all the stakeholders. We will meet with other African brothers and sisters and ensure that we take Africa, including South Africa, forward. •

Botswana

Population: 2,214,858
Land Area: 581,730 sq km
Official Language(s): English
Capital: Gaborone
Chief of State: President Seretse Khama Ian Khama (since April 2008)
Head of Government: President Seretse Khama Ian Khama (since April 2008)
GDP (PPP): $37.21 billion (2016 est.)
Growth Rate: 4.3% (2016 est.)
GDP per Capita: $17,300 (2016 est.)
Economic Sector Breakdown: agriculture: 1.8%, industry: 29.4%, services: 68.8% (2016 est.)
Exports: $7.226 billion (2016 est.)
Imports: $5.906 billion (2016 est.)
Major Trade Partners: South Africa, Namibia, India, Belgium, Canada

IBRAHIM INDEX OF AFRICAN GOVERNANCE (2017)

SOURCE: MO IBRAHIM FOUNDATION

2016 Rank (Out of 54)
3

2016 Score (Out of 100)
72.7

Safety & Rule of Law
81.6

Sustainable Economic Opportunity
64.6

Participation & Human Rights
66.9

Human Development
78.0

TAXATION RATES

SOURCE: PWC

Corporate Income Tax Rate
22%

Royalties
Base minerals 3%
Gold 5%
Diamonds 10%

MINING SECTOR CONTRIBUTION TO GDP

SOURCE: AFRICAN ECONOMIC OUTLOOK

2015
24%

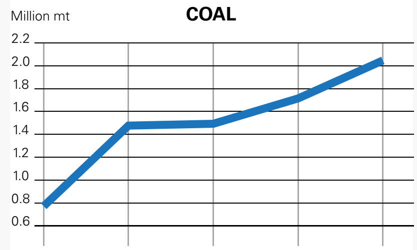
BUSINESS ENVIRONMENT RANKING IN AFRICA (out of 47 sub-Saharan countries)

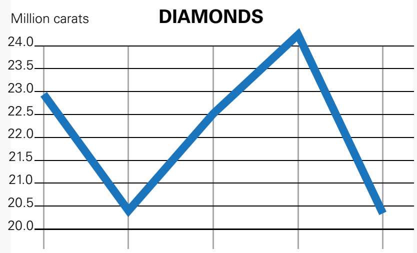
SOURCE: WORLD BANK

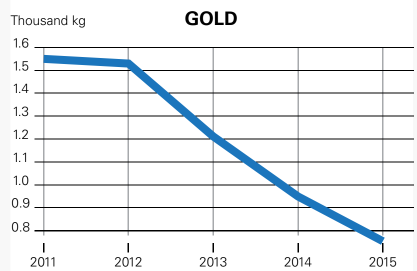
	2015
Ease of Doing Business	4
Starting a Business	31

MINERAL PRODUCTION

SOURCE: BRITISH GEOLOGICAL SOCIETY



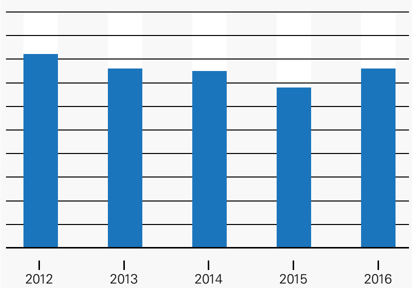




FRASER INSTITUTE INVESTMENT ATTRACTIVENESS INDEX

SOURCE: FRASER INSTITUTE

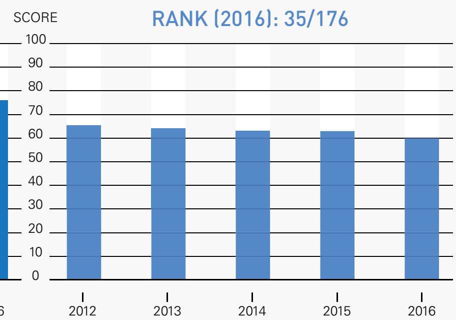
RANK (2016): 19/104



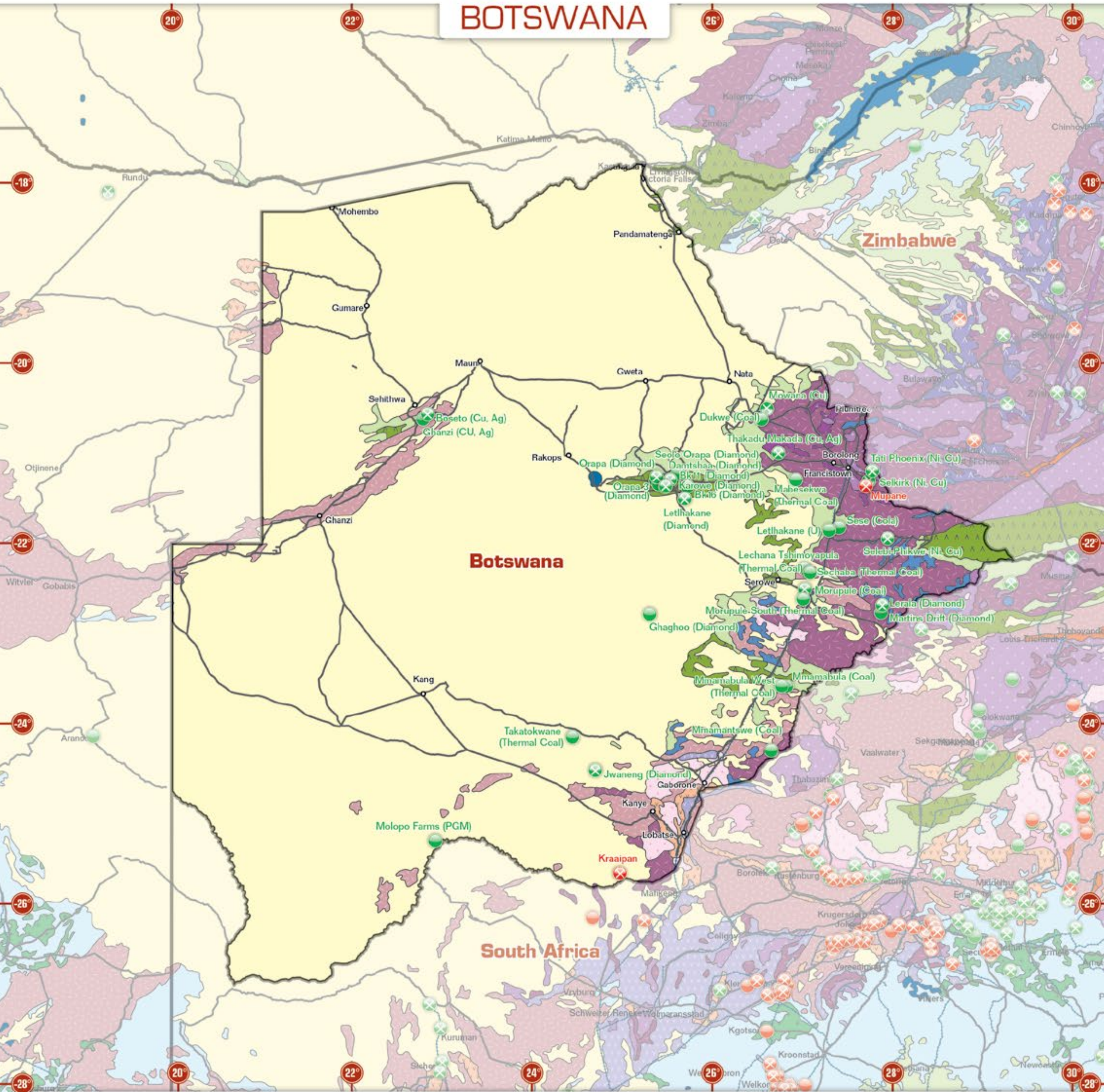
TRANSPARENCY INTERNATIONAL CORRUPTION PERCEPTIONS INDEX

SOURCE: TRANSPARENCY INTERNATIONAL

RANK (2016): 35/176



BOTSWANA



Your feet on the ground in Africa

NORTH — 0 50 100 150 KILOMETERS

GEOLOGICAL DATA: BRGM - LAT/LONG WGS84
Mine location data: www.mining-atlas.com
Map drafted: Kwaku Owusu-Ansah
Graphic design: www.arcildesign.com

2018 – 5th Edition

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GOLD MINES
- Existing
- Gold resources
- Closed

OTHER MINERALS
- Existing mines
- Projects
- Closed mines

- Geological boundary certain
- Country Borders
- Roads
- Railway
- Water area

CENOZOIC	MESOZOIC	PALEOZOIC	PROTEROZOIC	ARCHEAN
Sediment	Sediment	Sediment	Sediment	Volcanic felsic
Volcanic felsic	Volcanic felsic	Quartzite	Quartzite	Volcanic mafic
Volcanic mafic	Volcanic mafic	Volcanic felsic	Volcanic felsic	Plutonic felsic
Plutonic felsic	Plutonic felsic	Volcanic mafic	Volcanic mafic	Plutonic mafic
Plutonic mafic	Plutonic mafic	Plutonic felsic	Plutonic felsic	Metamorphic
	Metamorphic	Plutonic mafic	Plutonic mafic	Amphibolite
		Metamorphic	Metamorphic	
			Amphibolite	

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Botswana

Between its strong legacy in the diamond business and new opportunities emerging across other resources, Botswana remains an excellent destination for investment.

Well-known as one of the most stable countries in Africa, this sparsely populated country of sprawling wilderness and wildlife sanctuaries has built its sparkling reputation largely on world-class diamond deposits and good governance. Just one year after gaining independence in 1967, De Beers discovered a massive diamond mine in the Orapa region. A US$33 million investment to bring the mine into production began a fruitful partnership between company and country, eventually dubbed Debswana, that would allow De Beers to become a commanding force in the diamond market, and Botswana to evolve from one of the poorest countries in the world into a southern African success story.
"Botswana is a very stable environment because it is very well regulated with strong policies in place around mining, as well as some large, successful operations," confirmed Stephen Smithyman, CEO of Kanu Equipment.
Although the land-locked country witnessed the closure of three mines over the past year, the diamond industry has experienced a turnaround in fortunes. As dynamism returns, companies are eager to enter Botswana's profitable diamond sector with Debswana posting double-digit growth in the value of production during 2016. In late May 2017, Tsodilo Resources' subsidiary Bosoto was granted a prospecting license of 580 sq. km. in the Orapa Kimberlite Field, bordering Lucara Diamond's Karowe mine. Botswana Diamonds has two kimberlite exploration joint ventures in Botswana amongst a portfolio that includes 10 licenses in the Kalahari. These new initiatives in exploration, as well as adoption of new innovations, will be critical to enhancing the productivity of existing operations in Botswana's ageing mining sector. "We have noticed more openness to new technology and more of a need for mining companies to improve their efficiencies. Good ore is getting increasingly difficult to access, and technology is needed to do this," said Shahram Tafazoli, president and CEO at Motion Metrics, a Vancouver-based mining technology provider that operates worldwide.
A general decline worldwide in exploration funds for diamonds precedes a scenario in supply and demand that looks promising for juniors that are able to launch a successful program. As the largest consumers of diamonds, a healthy American economy bodes well for demand, as well as growth in Chinese and Indian markets where the growing numbers of middle class likewise suggests conditions for increased consumption. "For diamond supply to match diamond demand, there has to be a real diamond price growth because that divergence is economically not possible," explained James Campbell, managing director of Botswana Diamonds. "We are looking at a three to five percent price growth in real diamonds. From a long-term business perspective, diamond demand and pricing is robust."
While demand saw a dip in 2015, analysts forecast growth throughout 2018 based on encouraging numbers at the end of 2017; De Beers saw a 53% increase in sales this year compared to 2015, and Alrosa sold approximately US$4.4 billion worth of diamonds in 2017, representing a 27% increase from 2015.
However, the supply of diamonds coming from Botswana is dwindling. Within 20-30 years, the nation's industry may face a crisis. Subsequently, the country is earnestly considering how to diversify its economy to decrease its heavy dependency on the

One of the most significant areas of concern for us is trying to minimize diamond breakage through the efficient application of drilling technology and very sophisticated modeling techniques. There are not many people in the world who can do this.

- James Campbell, Managing Director, Botswana Diamonds

diamond market. In 2014, 86% of export revenues came from the sale of diamonds and around 20% of the country is employed across the diamond value chain, with Debswana the largest private employer in the country. Fortunately, mining projects in Botswana are not confined to diamonds. The country contains some of the largest coal reserves on the planet and several noteworthy projects are in the development stages. Kibo Mining intends to acquire 85% ownership of the Mabesekwa Coal Independent Power Project from Shumba Energy's subsidiary, Sechaba Natural Resources, a project that sits 50 km southeast of Botswana's second largest city, Francistown.

Interest in copper and zinc is also growing. The uptick in the copper price has undoubtedly provided a welcome boost in financing to promising projects such as Six Sigma Metals' drilling programs, which demonstrated a significant number of near-surface, high-grade intercepts. The company's Dibete project seems to share many geological similarities with the neighboring Messina copper mine in South Africa, which suggests the existence of ore bodies waiting to be defined at depth. The T3 project, a joint venture in the Kalahari between ASX-listed MOD Resources and AIM-listed Tiger Metals, expects to continue ramping up its drilling program throughout 2018 following the release of high-grade assay results. Australian-based Mount Burgess is currently developing a 30 million tonne zinc, lead and silver resource. Speaking about the company's plans, Nigel Forrester, managing director at Mount Burgess, said: "Our zinc resource is broken up into two deposits: Kihabe and Nxuu. We intend to develop the Nxuu deposit first as this presents a potentially low-risk path to early production at a modest capital investment. It is a very shallow, basin-shaped deposit with a maximum depth of 60 meters and the mineralization is totally oxidized. This means we can potentially produce zinc metal on-site through solvent extraction and electro-winning."

Between its strong legacy in the diamond business and new opportunities emerging across other resources, Botswana remains an excellent destination for investment. Often taken as an exemplar for how to successfully overcome the "resource curse", Botswana has the opportunity to use its stability to experiment with innovation. As the global mining community is increasingly held more accountable for social and environmental responsibilities, perhaps Botswana's mining sector has the best potential to represent Africa in tackling these ongoing challenges. •

Zimbabwe

Population: 13,805,084
Land Area: 390,757 sq km
Official Language(s): English
Capital: Harare
Chief of State: Executive President Emmerson MNANGAGWA (since 24 November 2017)
Head of Government: Executive President Robert Gabriel Mugabe
GDP (PPP): $32.38 billion (2016 est.)
Growth Rate: 0.7% (2016 est.)
GDP per Capita: $2,200 (2016 est.)
Economic Sector Breakdown: agriculture: 12.5%, industry: 27%, services: 60.6% (2016 est.)
Exports: $3.366 billion (2016 est.)
Imports: $5.351 billion (2016 est.)
Major Trade Partners: South Africa, Zambia, Mozambique

IBRAHIM INDEX OF AFRICAN GOVERNANCE (2017)

SOURCE: MO IBRAHIM FOUNDATION

2016 Rank (Out of 54)

40

2016 Score (Out of 100)

45.4

Safety & Rule of Law

46.0

Sustainable Economic Opportunity

37.2

Participation & Human Rights

42.8

Human Development

55.5

TAXATION RATES

SOURCE: PWC

Corporate Income Tax Rate

25%

Royalties

Diamonds 15%
Precious stones 10%, Gold 5%
Platinum 2.5%, Coal 1%

MINING SECTOR CONTRIBUTION TO GDP

SOURCE: AFRICAN ECONOMIC OUTLOOK

2015

8.7%

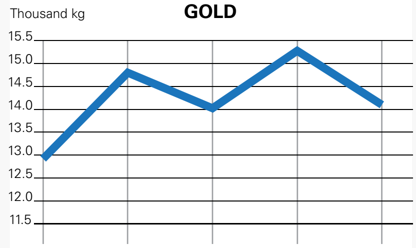
BUSINESS ENVIRONMENT RANKING IN AFRICA (out of 47 sub-Saharan countries)

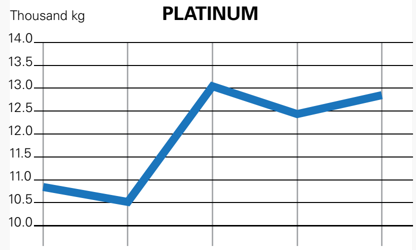
SOURCE: WORLD BANK

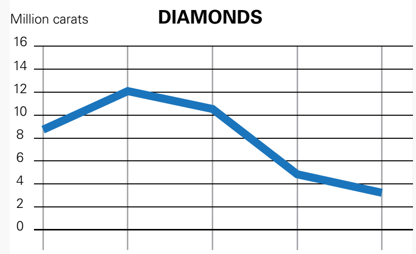
	2015
Ease of Doing Business	29
Starting a Business	42

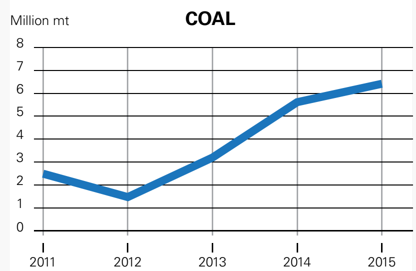
MINERAL PRODUCTION

SOURCE: BRITISH GEOLOGICAL SOCIETY





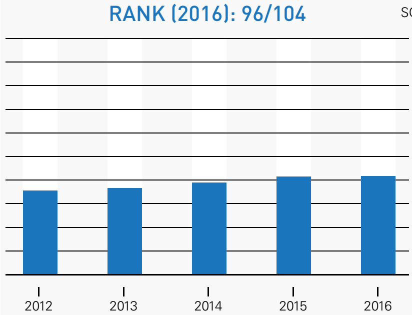




FRASER INSTITUTE INVESTMENT ATTRACTIVENESS INDEX

SOURCE: FRASER INSTITUTE

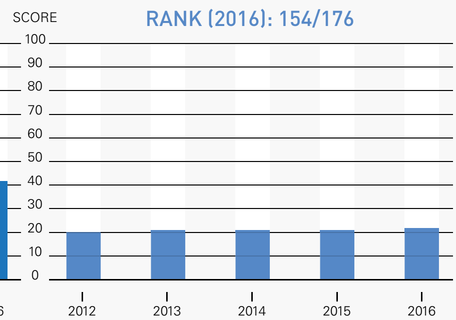
RANK (2016): 96/104



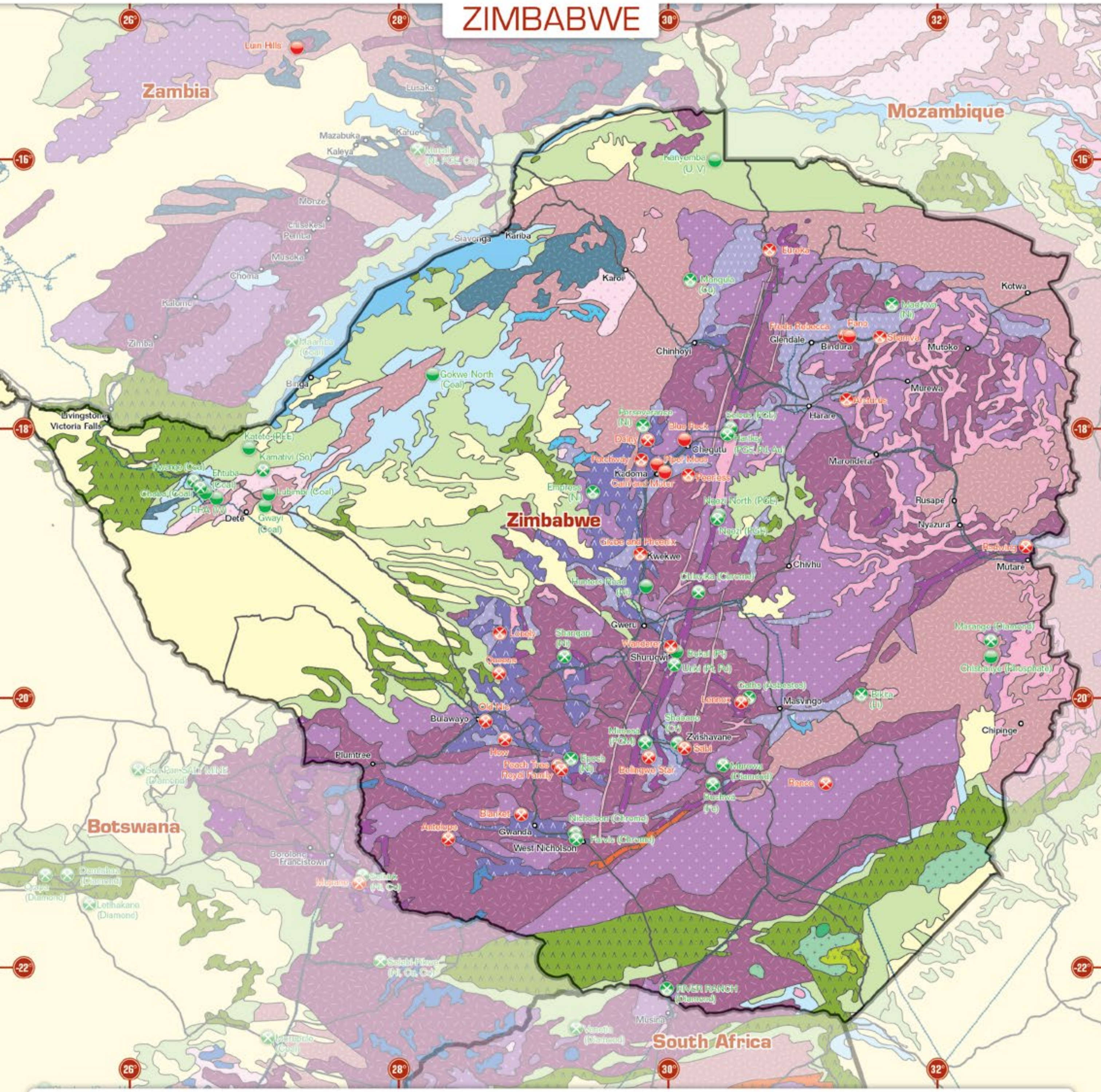
TRANSPARENCY INTERNATIONAL CORRUPTION PERCEPTIONS INDEX

SOURCE: TRANSPARENCY INTERNATIONAL

RANK (2016): 154/176



ZIMBABWE



NORTH

0 50 100 150

KILOMETERS

GEOLOGICAL DATA: BRGM - LAT/LONG WGS84
Mine location data: www.mining-atlas.com
Map crafted: Kwaku Owusu-Ansah
Graphic design: www.arcildesign.com

2018 – 5th Edition
www.sems-exploration.com

GOLD MINES
- Existing
- Gold resources
- Closed

OTHER MINERALS
- Existing mines
- Projects
- Closed mines

- Geological boundary certain
- Country Borders
- Roads
- Railway
- Water area

CENOZOIC	MESOZOIC	PALEOZOIC	PROTEROZOIC	ARCHEAN
Sediment	Sediment	Sediment	Sediment	Volcanic felsic
Volcanic felsic	Volcanic felsic	Quartzite	Quartzite	Volcanic mafic
Volcanic mafic	Volcanic mafic	Volcanic felsic	Volcanic felsic	Plutonic felsic
Plutonic felsic	Plutonic felsic	Volcanic mafic	Volcanic mafic	Plutonic mafic
Plutonic mafic	Plutonic mafic	Plutonic felsic	Plutonic felsic	Metamorphic
	Metamorphic	Plutonic mafic	Plutonic mafic	Amphibolite
		Metamorphic	Metamorphic	
			Amphibolite	

SEMS EXPLORATION | THE AFRICAN GEOLOGICAL CONSULTANCY GROUP

Zimbabwe

Zimbabwe is starting afresh and is looking for investors to reinvigorate its long-suffering economy.

Of all the countries in Africa, Zimbabwe has had the most eventful year in 2017. Robert Mugabe has been a stalwart of Zimbabwean and African politics since the country's independence from Britain when he became Prime Minister in 1980 and later President in 1987. In November 2017, the 37-year era of Mugabe finally ended when the President was arrested by his own military following Mugabe's attempt to be rid of Emmerson Mnangagwa, someone that had long been seen as Mugabe's successor, at the orders of Mugabe's wife, Grace. Mnangagwa's long-term allegiance within the Zimbabwean's security and military establishment proved vital as, within a week of Mugabe's removal, he would find himself being paraded into the streets of Harare as only the 3rd President of Zimbabwe.

As African history has previously shown, the end to dictatorship is never a guarantee for positive change. But there is now indisputably exciting potential for a country that was once known as the jewel of Africa. From Mugabe's early days, the economy has suffered a bumpy ride, reducing to half of its 1982 size in 2008, following the hyperinflation crisis. Since then, GDP quadrupled to US$16.62 billion in 2016 (IMF). Despite slow growth in 2016 at 0.6% of GDP, 2017 has been more positive with a 2.8% growth. The business community see Mnangagwa's new position at the helm as something positive for mining and investment in Zimbabwe. He is more business orientated and much more eager to set the economy going than his predecessor. On taking office, he appealed for Western sanctions to be lifted, for more foreign investment and declared a three-month amnesty for the return of stolen funds. He further pledged to compensate the 5,000 white farmers whose land was seized under Mugabe. The International Monetary Fund has said that Mnangagwa's government is committed to addressing the economic crisis and is preparing to unlock international aid, something that is desperately needed to stabilise Zimbabwe's economy. This will be one of Mnangagwa's many challenges that include addressing a substantial rise in extreme poverty since 2014, a severe cash shortage in the banking sector and a large trade deficit.

The potential to become a mining country has always been available for Zimbabwe. It has one of the largest concentration of mineral deposits along the Great Dyke corridor, with the second-largest reserve of platinum-group metals after South Africa. There are more than 40 different minerals including diamonds, platinum, nickel, copper, zinc and over 4,000 recorded deposits of gold, 90% associated with greenstone belts that are some of the richest in the world. Furthermore, Zimbabwe has high-quality diamonds with the 2nd largest reserve in the world and is now the 5th largest producer of lithium as it continues to expand its operations.

With more revenue and funds being demanded by the industry, it will come as welcome news that Mnangagwa plans to unlock investment in the mining industry by clarifying indigenization laws that have forced companies into having a black Zimbabwean majority percentage stake. Policy credibility within mining will be needed to increase the flow of foreign investment and dealing with corruption will also be on the agenda. The arrest of former mines minister Walter Chidhakwa by Zimbabwe's Anti-Corruption committee in December 2017 is some evidence that action is already being taken. A more business friendly environment will likely add to the list of companies operating in Zimbabwe that currently includes Anglo American Platinum, Metallon, Caledonia Mining, Impala Platinum, Kelltech and others. Anglo American Platinum have shown further commitment at their Unki mine by commissioning a new US$63 million smelter to accommodate a mine life set to extend beyond 2040. Kelltech look set to enhance their platinum portfolio by investing in a US$200 million refinery in Zimbabwe. China is likely to continue strengthening its ties in the country, whilst the UK will aim to keep some influence over its former colony.

Total mineral export for the first half of 2017 exceeded the US$1 billion mark as the sector aims to grow from US$2.2 billion to US$3 billion a year. With further reforms continuing throughout 2017 and new policies expected from the Mnangagwa government, 2018 should see a continuation of this upward trend. The first half of 2017 saw Zimbabwe's Consolidated Diamond Company, driven by government investment of US$30 million, raise production that will likely see the mining sector increase by 5.1%. Rough diamond production in this period increased by 1.1 million carats compared to 690,000 in all of 2016. Increased transparency in government may help the diamond industry not have a repeat of the Marange diamond fields scandal, where at least US$2 billion of diamond went unaccounted for.

Gold and platinum group of metals (PGMs) continue to be the backbone of mineral exports. November's crisis had little impact on the performance of either platinum or palladium as production of the metals continued during this period. Zimbabwe has a 7.6% share of the global platinum market with annual production of 450,000 ounces. Zimplats, which specialises in platinum group metals, saw a small decrease of 3% in platinum production, fairing better than the 10% decrease expected nationally. World Platinum Investment Council CEO Paul Wilson expects a 2% increase in platinum production in Zimbabwe in 2018 and a strong year for platinum globally.

Gold production has had a successful year as output increased by 22% in Q1 for 2017. There was an expected growth in the production of gold from 19 tonnes in 2016 to 24 tonnes in 2017. RioZim, a former subsidiary of RioTinto, reported a 16% growth in revenue of US$37 million for the first half of 2017. Its acquisition of the Dalny mine, which produced 196 kg of gold during this period, and the commissioning of Cam & Motor mine were contributors to this. Specifically, RioZim's gold production increased by 13% to 873 kg. Caledonia Mining saw an 18% rise in gold production in January 2017 with revised plans to the Blanket mine expected to increase production to approximately 80,000 ounces by 2021. South African company, Metallon is also heavily investing in Zimbabwe with aims to raise output to 500,000 ounces per year in the next five years. The company recorded a 22% increase in its production in 2017, following low production figures of 94,212 ounces for 2016. Despite positive growth in gold, Mnangagwa's government will need to address illegal gold panning seen all over Zimbabwe. Estimations from The United Nations Industrial Development Organisation suggest that between 2007-2012, there were 500,000 illegal miners, with the figure likely to have vastly increased since then.

The Zimbabwe government has reiterated its desire to diversify the country's mining sector. Zimbabwe's Mining Development Corporation has sought US$500 million from investors to enhance the production of copper at the three mines in Mhangura, Sanyati and Alaska. After a period of stagnation, Zimbabwe is aiming to develop the whole value chain of copper. Recovering commodity prices, governmental transparency and regulation changes will be received warmly by junior mining companies that will look to diversify into the market. Prospect Resources, the Australian-listed junior, is in the process of raising US$55 million to develop a lithium chemical plant at its Arcadia lithium project, which with 1.85 million tonnes lithium carbonate equivalent (LCE), is the largest code compliant hard rock lithium deposit in Africa. The Arcadia petalite ore has produced ultra-high purity 99.8% lithium carbonate.

Chromium has great potential in Zimbabwe with the 2nd largest reserve of 140 million tonnes and resources for a further billion tonnes. Furthermore, it is the only country to exploit both stratiform and podiform deposits. The government has signalled a change to cheaper strip mining operations by inviting investors to focus on underground operations. The Mittal family added to its ferrochrome portfolio by acquiring Zimbabwe Alloys with plans to inject US$100 million to revive the chrome miner.

The fragile state of Zimbabwe's energy sector and its future will play an important role in the economic growth of Zimbabwe and its mining sector. Around 60% of the country's population are still off the grid and despite the vast amount of reserves, coal production declined by 40% in 2016. The Hwange Thermal Power Station, the country's premier station, was running at less than a third of its capacity. Coal prices were slashed by 8% to US$59/mt in a bid to increase sales and combat mass deforestation across the country. Away from coal, there is undoubted potential for renewable energy in Zimbabwe through hydro, solar and biomass energy. A potential green energy fund was put forward last year in a bid to produce one gigawatt of renewable energy capacity by 2025, but funding delays continued to hamper proceedings. The planned venture included three solar power projects at Gwanda, Munyati and Insukamini, each with a 100MW potential. Without funding, Zimbabwe lacks the current technology to exploit its potential energy resources.

2018 will be very telling as to whether Mnangagwa and his new government will be able to resurrect Zimbabwe's economy. Only time will tell whether he can pick up the pieces left by his predecessor. Diversifying the economy and mining industry, and cracking down on widespread corruption will be high on his agenda in a bid to combat widespread poverty. However, Mnangagwa will know that with cash shortages across the country, the only way up will be through much-needed international aid and investment. •

Zambia

Population: 15.972 million
Land Area: 752,618 sq km
Official Language(s): English
Capital: Lusaka
Head of Government: President Edgar Lungu (since 25 January 2015)
GDP (PPP): $65.13 billion (2016 est.)
Growth Rate: 3.4% (2016 est.)
GDP per Capita: $3,900 (2016 est.)
Economic Sector Breakdown: agriculture: 5.4%, industry: 35.7%, services: 60% (2016 est.)
Exports: $6.514 billion (2016 est.)
Imports: $6.539 billion (2016 est.)
Major Trade Partners: Switzerland, China, DRC, South Africa

IBRAHIM INDEX OF AFRICAN GOVERNANCE (2017)

SOURCE: MO IBRAHIM FOUNDATION

2016 Rank (Out of 54)

16

2016 Score (Out of 100)

57.7

Safety & Rule of Law

66.4

Sustainable Economic Opportunity

48.9

Participation & Human Rights

57.7

Human Development

57.7

TAXATION RATES

SOURCE: PWC

Corporate Income Tax Rate (for mining)

30%

Royalties

Open cast mines 9%
Underground mines 6%

MINING SECTOR CONTRIBUTION TO GDP

SOURCE: AFRICAN ECONOMIC OUTLOOK

2016

12%

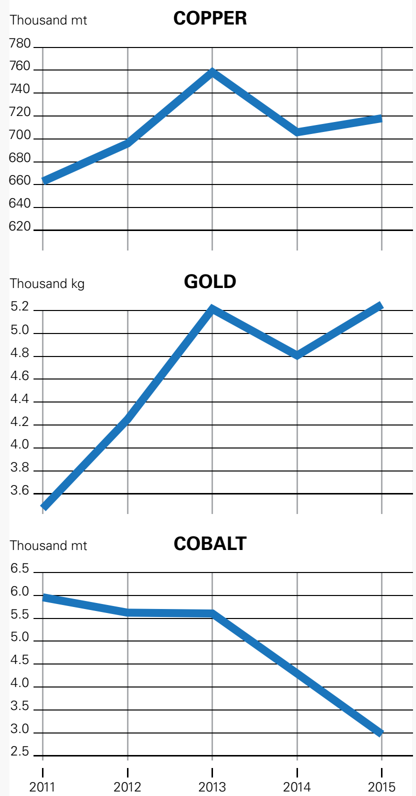
BUSINESS ENVIRONMENT RANKING IN AFRICA (out of 47 sub-Saharan countries)

SOURCE: WORLD BANK

	2015
Ease of Doing Business	6
Starting a Business	15

MINERAL PRODUCTION

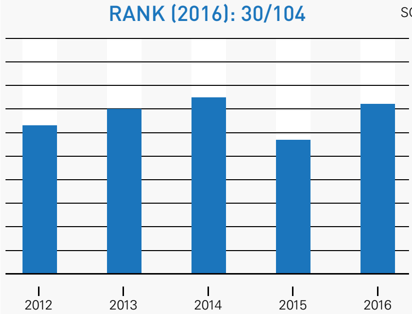
SOURCE: BRITISH GEOLOGICAL SOCIETY



FRASER INSTITUTE INVESTMENT ATTRACTIVENESS INDEX

SOURCE: FRASER INSTITUTE

RANK (2016): 30/104

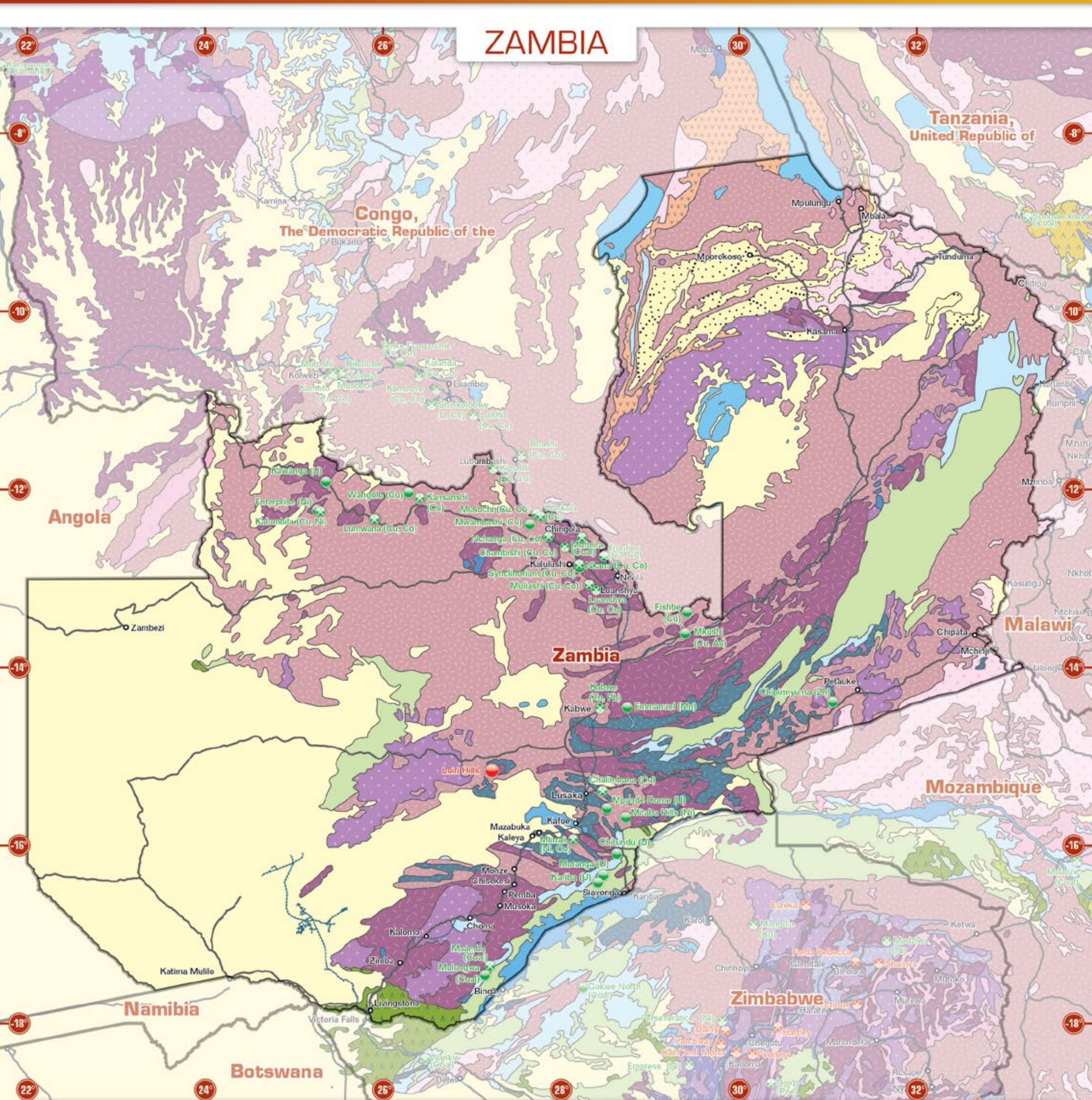


TRANSPARENCY INTERNATIONAL CORRUPTION PERCEPTIONS INDEX

SOURCE: TRANSPARENCY INTERNATIONAL

RANK (2016): 87/176

ZAMBIA



Your feet on the ground in Africa

NORTH

0 50 100 150 200

KILOMETERS

GEOLOGICAL DATA: BRGM - LAT/LONG WGS84
Mine location data: www.mining-atlas.com
Map drafted: Kwaku Owusu-Ansah
Graphic design: www.arcildesign.com

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GOLD MINES
- Existing
- Gold resources
- Closed

OTHER MINERALS
- Existing mines
- Projects
- Closed mines

- Geological boundary certain
- Country Borders
- Roads
- Railway
- Water area

CENOZOIC	MESOZOIC	PALEOZOIC	PROTEROZOIC	ARCHEAN
Sediment	Sediment	Sediment	Sediment	Volcanic felsic
Volcanic felsic	Volcanic felsic	Quartzite	Quartzite	Volcanic mafic
Volcanic mafic	Volcanic mafic	Volcanic felsic	Volcanic felsic	Plutonic felsic
Plutonic felsic	Plutonic felsic	Volcanic mafic	Volcanic mafic	Plutonic mafic
Plutonic mafic	Plutonic mafic	Plutonic felsic	Plutonic felsic	Metamorphic
	Metamorphic	Plutonic mafic	Plutonic mafic	Amphibolite
		Metamorphic	Metamorphic	
			Amphibolite	

SEMS EXPLORATION | THE AFRICAN GEOLOGICAL CONSULTANCY GROUP

Hon. Christopher Yaluma

Ministry of Mines and Mineral Development
Zambia

How will the government's turn towards diversification into other sectors impact the mining industry?
The government will continue to stand on the contribution of mining and copper to our economy. We are also looking to better promote the energy minerals, such as coal and uranium, and base metals that have been neglected, including manganese, nickel, and cobalt. We are also looking to take better advantage of the potential for construction materials. Emeralds for the past four to five years have contributed strongly to the economy. As we recover from the consequences of power shortages and low commodity prices, our priority going forward will be to support the capacity of the mines to take advantage of the rebound in the copper price.

Last year's severe drought saw water levels at Kariba dam reach record lows. What is the government doing to combat the resulting power issues faced by the country?
We are moving very seriously on this issue because it was quite disastrous for the mining industry's ability to produce beyond its threshold. Dropping water levels challenged us to be more innovative to ensure that we will avoid the consequences in the future. We will accomplish that by exploring other energy resources, and we are very much headed towards utilizing renewable. Solar facilities are underway that will connect to the grid when hydropower generation is low. Furthermore, it was not our wish to venture into coal-fired power, but to ensure that we have thermal capacity, Maamba will aid in generating a further 300 megawatts that will assist in meeting the growing demand for power. We are also embarking seriously into biomass, with CEC conducting an 80 megawatt project. In the next 5-6 years, we expect Zambia to become a hub for power generation.

What plans does the ministry have in place to support the country's small-scale miners?
Government has now begun to seriously strategize how to support small-scale miners. We would like to tap into sources of funding to assist them in their projects. Traditional banks have been highly conservative in this regard, which has heavily impeded Zambians' capacity to participate effectively in the mining industry. The resolution of the government is to provide a guarantee for small-scale miners to access financing. However, we also need to see the small-scale players provide a sound business case that has been followed-up by serious due diligence.

What is the government doing to promote the industry's capacity to develop in-country initiatives?
The growth of this industry will rely on value addition being achieved here in Zambia. We are sending copper to be disintegrated abroad, and when in the processing other minerals are recovered, that is money lost to the government. It also represents a loss of employment for Zambia. We are losing out on two levels: a means of sustaining our own people and lost revenue for the government.

How does the Ministry balance support for international players with the interests of local companies providing goods and services to the mines?
In a way we have failed in that because there are loopholes that some have passed through without us knowing. We can compel international investors to help us boost the participation of Zambians through partnerships, but the regulation pertaining to this area is not very clear. When the participation of Zambians in the supply chain is better defined and supported by legal frameworks, we will achieve a better outcome. We need to better ensure that there are no means by which both local Zambians and international companies can avoid fulfilling their respective mandates, because both parties can play a critical role if they collaborate more effectively.

What developments will be most critical to the future of Zambian mining?
We need more geological mapping because that will determine the level of investment. People need that data so that when they spend money on drilling, they have some idea what the earth contains. Data will assist the people deciding where they want to put their money. We are in a hurry to map Zambia, and we have put initiatives in place to ensure is happens. The Chinese issued a grant to recover this data, and are currently covering the northern province, which forms only 1%, however you look at that scale on a map, it is meaningful. By the end of 2017, we will have Zambia fully mapped. •

Zambia

Zambia hosts a both a relatively mature mining industry and vast exploration potential with a lot of sparkle.

Long lauded as one of the more peaceful nations in the Southern Africa region, Zambia's historic association with political stability has undoubtedly contributed significantly to its consistent attractiveness as a destination for foreign investment. When the late 1990s ushered in the privatization of the nation's mining industry, copper production increased from 300,000 mt/y to over 800,000 mt/y by the end of 2017. Sustained international interest in Zambia's wealth of resources in tangent with rising copper prices facilitated the country's rise as a globally significant player in the commodity marketplace. Over the years, the nation's geological prospectivity has drawn the attention of the likes of De Beers and Anglo American and, with the names of these powerhouses once again in the air, Zambia's future appears to have taken on the luster of its famous emeralds.

Nonetheless, the country has experienced its fair share of recent troubles. Fiscal flip-flopping has left some investor's uneasy at the staying power of the stability in the tax regime. "The issue of the ever-changing tax regime and mineral royalties has been the largest deterrent for our clients in the mining industry," explained Jason Kazilimi, senior partner at KPMG Zambia.

Power sector problems also plagued the mining industry from 2015 and into 2016, and Zambia has felt the strain brought on by the volatility in commodity pricing of recent years. Its ageing industry implies an urgent need for new discoveries amidst the worldwide deficiency in exploration funds, and the ongoing debate between the private sector and government on how best to reconcile business imperatives with national development concerns persists. Although the nation grapples with the lingering impact of prior years' problems and the abiding issues of politics and regulations, green shoots in the global economy have inspired a cautious optimism across the value chain. Zambia's large-scale mining houses are ramping up production once more, and exploration initiatives are proliferating as the buzz around the untapped potential of the "new Copperbelt" draws more and more players to the nation's prospective North-West Province. Updates from the energy sector suggest a surprisingly promising outlook for Zambia's capacity to overcome the havoc wreaked by electricity shortages — developments driven largely by the need to power the mining industry. Service providers, both international and local players, are investing in their capacity in anticipation of increased demand for their offerings. On the whole, it seems that Zambia is back on track as a regional leader in mining.

Production & Exploration

Base Metals: Copper Remains King

When copper prices dropped by 25% in 2015, Zambia's copper-oriented economy felt the impact. The age of the sector means that many established mines are relying on ore bodies found at increasing depths, making ore more costly to retrieve and therefore less economical in the face of falling prices. However, with the price breaching as high as US$10,000/mt and showing signs of sustained recovery, production is ramping back up and, in 2018, the Ministry expects to surpass production of 1 million tonnes.

Notwithstanding the contribution of other commodities and the gemstone sector to the overall success of the country's extractives industry, copper remains king, and approximately 80% of Zambia's copper production comes from four major players: First Quantum Minerals, Konkola Copper Mines (KCM), Mopani Copper Mines, and Barrick's Lumwana mine.

Updates on the state of these production powerhouses provides a strong indication of the industry's overall health. While FQM's Kansanshi copper mine continues to be a powerful contributor to Zambia's overall output, the company's Trident project will prove instrumental in reaching the country's vision of surpassing its neighbor to the north, the DRC, in terms of copper production. FQM's current focus in the country is ramping up the Sentinel mine to nameplate capacity of 270,000 mt/y. 2017 was the first time since 2015 that the Kansanshi and Sentinel mines were able to run on unrestricted power, so production figures should only continue to improve throughout 2018. Mopani's mines at Nkana and Mufulira, which have been in operation since the 1930s, had been operating at a loss and face declining reserves. However, with the support of 73.1% majority shareholder Glencore, Mopani is investing US$1.1 billion into enhancing efficiency and revitalizing its production capacity, including sinking three new shafts. KCM has announced ambitious production goals, intending to triple its output over the next three years aided by a pledge of US$1 billion in financial support from its London-based parent company Vedanta Resources. The company will also resume activities at the Nchanga underground mine operation, which was placed on care and maintenance in 2015.

Although undeniably critical, copper is not the only base metal to be found in Zambia, and developments in the nickel sector have proven particularly interesting. In addition to the Sentinel mine, FQM's Trident project in the Kalumbila district comprises of a nickel ore body dubbed Enterprise that the company intends to bring into production when the price proves favorable. "Enterprise shares commonalities with the Sentinel plant, and under the right conditions it will not take much for us to commission Enterprise relatively quickly," said John Gladston, government affairs manager at FQM.

Towards the south, the Munali nickel mine will end a three-year hiatus to begin production under new British investors, Consolidated Nickel Mine (CNM). Placed under care and maintenance in 2011 due to poor performance, Munali's new owners intend to invest US$40 million into efforts that will produce more attractive returns and expand the mine's life by an additional 10 years. "Of the US$40 million we have about US$12 million in mining fleet financing coming up and for the balance of US$28 million we are considering off-take financing and equity," elaborated Simon Purkiss, managing director of CNM, who expects that the price of nickel will prove resilient over the coming years. "Nickel is a factory metal and people are beginning to become aware of that. There is renewed interest from the equity side, and with China, for example, looking to produce 5 million electric cars in the near future, Nickel will remain an important part of the matrix," he said.

Gemstones: Love in the Time of the Copper Downturn

Because of its relative cushion from the volatile commodity marketplace, Zambia's gemstone sector escaped the consequences of the downturn, and has in fact been quietly attracting investment from around the world. Although the sector is often thought to be the business of small, artisanal miners — who indeed play a significant role in the industry — Zambia is also home to some of the world's largest gemstone mines. These mines have played a decisive role in enhancing the sector's sustainability by providing a consistent supply of products and branding potential. Emeralds in particular have benefited from this cohesive production strategy, allowing the distinctive blue undertones of Zambia's stones to garner global recognition and appreciation.
Two of these mines are backed by London-based Gemfields, the world's largest colored gem producer. Kagem mine represents the world's single largest producer of emeralds, accounting for around 25% of global production. As a key player in the gemstone mining value chain, Kagem's expertise has helped to drive the sector forward by developing the local capacity for everything from processing and grading to auctioning and marketing. Operating for over 60 years, the Kariba mine in the southern part of Zambia's Kalomo district is the world's largest amethyst mine, producing as much as 800 mt/y and projecting a further increase in production for 2018. Gemcanton emerald mine, formerly known as Grizzly emerald mine, was bought 50% by Lev Leviev in June 2017,

Image courtesy of Munali

adding emeralds to the Israeli billionaire's previously diamond-dominated portfolio.
Although their contribution to global production is already significant, gemstone deposits in Zambia are still vastly untapped resources. The availability of capital is the crucial component needed to push forward the sector. "Zambia has much potential for precious stones if it can find the means for funding," said Iven Mulenga, managing partner at Iven Mulenga & Co, whose practice has seen business from investors coming from the Middle East and Asia that are interested primarily in emeralds. "A number of people have obtained licenses, but they do not have the capital to take their projects forward."

Exploration and Development: Zambia Not Immune to Tough Global Conditions

Despite being a well-established jurisdiction, Zambia's geology remains widely unmapped, making a risky exploration endeavor an even greater challenge in the face of uncertain — or indeed nonexistent — data. Nonetheless, exploration for new deposits will prove critical. The challenging conditions of an aging mine do not allow for attractive returns in a time when the industry is seeking to achieve a cost profile that fits with lower commodity prices.

Chibuluma mine, known as "Zambia's model mine" stays true to its name in exemplifying this necessary strategic shift. Having been mined since 1955, the copper reserves at Chibuluma had been depleted to the point that the mine was facing end of life as soon as 2017. The problems associated with its age, in combination with the unattractive copper price, saw the company running at a loss of US$30 million in 2015. However, concerted efforts to enhance the mine's efficiencies and ongoing regional exploration initiatives have bolstered the mine's reserves through the extension of the ore body at Chibuluma South, in addition to defining the Chifupu deposit. "We could have put the mine under care and maintenance, but Jinchuan, through Metorex, took a long term view and decided to expand its footprint in Zambia," explained Jackson Sikamo, the country manager at Chibuluma Mines. "They made the strategic decision to keep the mine going, because continuing operations at the Chibuluma mines gave Jinchuan the opportunity to look for resources elsewhere in the country."
In addition to its brownfield endeavors, Metorex has obtained two new exploration licenses in Zambia's North Western Province. Dubbed the "new Copperbelt," there is a discernible shift in interest towards the region, which already homes Barrick's Lumwana copper mine. However, as Panorama Security's director Stewart J. Scott points out, there are risks to be considered as new projects start to emerge: "The socio-economic environment in the Copperbelt and North-Western Province generates significantly higher levels of risk which, in turn, creates opportunity. When a new mine comes online, people tend to flock to the site looking for employment with very low chances of success. This creates a massive security risk for the mine, and we have to find ways to engage with the community to find a platform through which they can benefit from the client's presence. Otherwise, you alienate these people and create an 'us versus them' structure that exposes the client to further risk."
Generally, Zambia's exploration potential faces impediments because exploration spend worldwide has been decreasing, suggesting that the additional risks of operating in Africa would further deter investment. However, Daniel Major, CEO of GoviEx Uranium, said: "From a project perspective, we have found that being in Africa actually helps. Because we are in a developing region, export credit agencies (ECAs) tend to be supportive, whereas they may be less likely to offer assistance in a developed country."
The Canada-based company has three

advanced stage uranium projects with significant exploration upside, including the Mutanga deposit in southern Zambia. In addition to uranium and its copper potential, gold and manganese could begin to play a greater role in the Zambian mining sector. Cobalt's attractive price, driven by global interest in the commodity's role in the production of lithium-ion batteries, could also prove a productive endeavor if the lower grade of Zambian deposits does not deter advancements.

Zambia's Power Predicament: Problems and Solutions

The depressed copper price was not the only external challenge haunting the Zambian mining industry, and chronic electricity shortages across the nation added to the woes of already high operating costs for the mines. A dispute between the government and mining companies over energy tariffs intensified the ongoing conversations about the private sector's contribution to state revenue, culminating in both Mopani and FQM briefly halting operations when their power was temporarily reduced in August 2017. Drought brought on by climate change severely reduced water levels at the country's Kariba Dam, which typically generates about 40% of the country's electricity. Consequently, the government reiterated its efforts to diversify its power generation sources to stem its reliance on hydroelectricity, focusing largely on the potential for renewable sources in addition to its coal-powered capacity. However, the costs incurred in developing the generation, transmission, and distribution supply chains have strained fiscal resources, resulting in the reexamination of the validity of longstanding Power Supply Agreements (PSA) the government had in place with the mines that previously allowed the sector to consume 50% of Zambia's electricity at reduced rates. The introduction of cost-reflective electricity prices and the end of longstanding government subsidies for the mines begs the need for an intensified overhaul of Zambia's energy capacity if the mining sector is to retain an attractive operating environment.

The commissioning of the 150 MW power plant by Maamba Collieries Limited (MCL) will bolster Zambia's thermal energy output in the interim, and the country's ample coal reserves could help to generate as much as 300-700 MW. However, the environmental implications of coal mean that many DFIs will not provide financing for such initiatives, further underlying Zambia's need for an energy mix. At the center of finding a solution to the predicament is Copperbelt Energy Cooperation (CEC), a ZCCM-IH subsidiary that was originally formed in 1953 with the purpose of supplying power to Zambia's mining industry. Fast-forward to present day, and the company still prioritizes its ser-

vices to the mines, however, it has grown to encompass a fully integrated mandate that endeavors to expand Zambia's capacity as a regional leader in power generation and transmission. The company currently owns much of the transmission infrastructure in the Copperbelt, which it uses to transport power on behalf of third party sources — namely the national energy company Zesco. However, CEC has a number of projects in the works to develop its own generation capabilities, which presently stand at 80 MW. The company's 40 MW Kabompo Gorge project is located strategically in the north, whereas most power generation stations are in the south of Zambia. The company also has a 1 MW solar project in partnership with Copperbelt University that represents the country's first grid-scale solar project and prequels plans to introduce a 50 MW project following its completion by the end of 2017. "This initial small-scale project will aid in developing our solar technology and the capacity of our engineers," said Owen Silavwe, the company's managing director.

Importing expensive power supply resulted in high tariffs for the mining industry that it claims are not sustainable. However, Zambia has recognized the need to diversify its energy supply and is keenly aware of its natural endowments that underpin the opportunity to be a regional leader in the energy sector. Because power infrastructure tends to be capital intensive, the potential for off-take agreements with the mining industry may represent a mutually beneficial avenue to finance the development of the power sector in the Southern Africa region.

Transport and Logistics

Zambia's geographic position simultaneously presents both challenges and opportunities. As a landlocked nation, the lack of a seaport stunts the nation's export potential while also driving up the price of imports. On the other hand, Zambia borders eight different countries, allowing it to serve as a regional transport hub and gateway between Central and Southern Africa. However, if Zambia is to successfully market itself as a land-linked intersection for international trade, key improvements to infrastructure must be prioritized. Several government-funded projects suggest that the country is making a concerted effort to improve its road networks, including in the Copperbelt and North-Western Province. However, in the face of rising debt, the government's capacity to continue with these projects may well be impacted if state revenue must be diverted.

Subsequently, several players in the mining space have undertaken key road works themselves. FQM spent US$3.5 million on the road linking Solwezi to Chingola. With the increasing emphasis placed on the North-Western Province as an area with untapped mineral potential, Solwezi is set to act as the doorway into the region as a flood of service providers scramble to set up shop in the town, making this a strategic investment in the future of the region. Nonetheless, to maintain the quality of the roads has proven another perennial issue that can have a significant impact on the profitability of a project when considering the added cost of wear and tear in the transport process. In order to offset these expenses, transport companies such as the BHL Group, are becoming more innovative. "We used the Rhino as our symbol to reflect our company's strengths. We consider ourselves to be groundbreaking through the use of new technologies in our vehicles," said Elrick De Klerk, CFO of the company. "For example, we developed a dual trailer where you can put dry product in the middle and back, and at the front you have tanks for liquids. This minimizes empty runs, maximizes payload, and decongests the roads, making our offer more efficient and cost effective."

The ASM-LSM relationship is often conflictual because both types of miners compete for the same resource or because they perceive of each other as a threat. Hence we have seen an increase in situations where LSM are now shorting ASM to protect the minerals. However the ASM-LSM relationship is now also undergoing a largely positive evolution in some part due to new CSR commitments.

- Simon Njovu,
President,
SSMAZ

Equipment and Services

Surviving during lean times in Zambia's highly competitive service provider sector proved a trying test for its players. However, those that pulled through are beginning to reap the benefits as new contracts come through and demand for equipment returns. Closely linked to this positive growth trend is the emphasis on infrastructure. "The government's many infrastructure projects represent an opportunity for us," explained Nawa Mataa, director at Hitachi Construction Machinery Zambia. "Because these projects are seen as long term, contractors in that space are willing to pay a premium to obtain quality machines as opposed to cheaper brands," he added.

When looking to cut production costs, many mines tried to save by utilizing inexpensive products, often sourced from mass-manufacturing countries like China or India. "The Chinese pricing is incredibly competitive, causing us to have to reduce our rates," said Seamus McKenna, director at Paul McKenna & Sons. "However, in the long run, we do not believe that the Chinese machines will last."

Indeed, the lower quality of the products in the market has begun to show, and proprietors of more expensive yet higher quality equipment are seeing demand return. "The mining sector has become more particular about who they are dealing with," said Raj Karamchand, director at Hytec Zambia. "Price is still a factor, but in most cases, they are more concerned with getting something that is going to last longer and will reduce downtime."

Service providers employed a range of strategies to pull through challenging times. Maintaining solid relationships with clients through the provision of after-sales and maintenance services was key for many companies. "We have a high number of machines on the market, so we rely heavily on our parts and after-sales to generate strong revenue," said Mike Quinn, general manager of Bell Equipment in Zambia and the DRC.

Particularly when faced with the consequences of poor quality equipment, mining companies are investing in the supe-

Chinese investment appears to come with the conditionality that Chinese labor should do a significant proportion of the project. Consequently, the government has implemented new immigration laws wherein a work permit will only be granted if there is no qualification available in Zambia.

- Charles Mkokweza,
Partner,
Corpus Legal Practitioners

rior services that are often accompanied with well-established brands.
Diversification into other sectors, particularly the highly government-promoted agricultural industry, provided many companies with a means of staying afloat. Alternatively, some suppliers chose to diversify within the sector, joining the throngs of Zambia's small-scale miners to open their own mining operations.

Local Content

The long-term sustainability of Zambia's economy will heavily depend on the success of its locally operated SMEs. As a long-established mining destination, the Zambian labor force is well equipped to take advantage of the opportunities surrounding the extractives industry. "Investors should not be concerned about the availability of qualified labor to run a mine," said Jason Kazilimi, senior partner, KPMG Zambia. "Certain specialized skills may require expertise from abroad, but for almost any business you should be able use people that are available locally."
When skills are not available, a host of international players have been keen to take advantage of the lucrative gaps. "The South African mining game has been going for a long time, but in Zambia there is still room for development, which is where companies like ours can play a role," elaborates Louis Lindenberg, whose South African-based company Lindenberg Hydraulics has initiated operations in Kitwe, offering its expertise in mechanical engineering to the Zambian gemstone sector.
While there are still voids in the local skills market, the general consensus is that the Zambian population has the capacity to service the industry, and where it does not, the emphasis should be on providing training. "Foreign companies should not solely rely on corporate social responsibility (CSR) initiatives as a means of giving back to the host country because these projects are not as sustainable," said Mwaba Coster, general manager of Hearmes Mining and Trading. "Often companies come in and build something that does not add true value to the community if it is not accompanied with training and support."
Locally owned and operated in Zambia for 19 years, Hearmes is one of several companies in mining hubs like Kitwe and Ndola that provide services ranging from engineering consultancy to supplying labor and equipment. Simon Njovu, president of the Small Scale Miners Association of Zambia (SSMA), emphasizes the importance that strong government policy could play in improving the involvement of Zambians into the sector: "Key stakeholders noted the need for the mining industry to more effectively use local products and services, but currently there is no national supplier development policy for the industry," he noted, adding, "Consequently, 95% of goods and services used by the mining industry are imported."
A lack in available capital also prevents many Zambians from developing mining projects, but the potential of the nation's artisanal and small-scale miners (ASM) to form productive relationships with large-scale miners (LSM) might offer solution. Increased formalization of the ASM sector could allow LSM to invest in the activities of local Zambians, while also increasing state revenue and overall production levels.

The Way Forward: Value Addition

Local value adding initiatives in Zambia are more advanced than many of its African counterparts. No raw copper ore is currently exported from the country, but there are still several layers of benefaction that could be achieved to allow the country to take even greater advantage of its raw potential. Berry Mwango, director of locally run C&B Engineering elaborates: "It is important that we are looking at local content because Zambia is losing out on a lot of its mineral potential as a country. Depending on the location of the mine, much of the copper waste has a lot of gold content, for example. The Copperbelt also has a lot of other minerals such as cobalt, titanium, and selenium that are exportable within their own right if processed. Some operators deliberately leave cobalt in the copper mix to extract outside the country."
Further processing could also be achieved to enhance the purity of the copper concentrate being exported. These are well-observed challenges in the industry and, as Hon. Yaluma points out: "We are losing out on two levels: a means of sustaining our own people and lost revenue for the government."
Forging strong partnerships built on trust and integrity between local talent and the expertise offered by outside players will undoubtedly prove the most efficient and lucrative means of achieving a sector that benefits both Zambians and international investors. •

GBR Mining Opinion Survey

I believe that political stability in Zambia will endure:

STRONGLY AGREE (30%)

AGREE (45%)

NEITHER AGREE OR DISAGREE (15%)

DISAGREE (5%)

STRONGLY DISAGREE (5%)

The mining sector in Zambia has a positive outlook for 2018:

STRONGLY AGREE (15%)

AGREE (70%)

NEITHER AGREE OR DISAGREE (10%)

DISAGREE (0%)

STRONGLY DISAGREE (5%)

I believe the rate of permit processing in Zambia is:

VERY GOOD (10%)

ABOUT RIGHT (50%)

TOO SLOW (40%)

Government relations with the private sector in the Zambian mining industry have been favorable in the past 12 months:

STRONGLY AGREE (25%)

AGREE (50%)

NEITHER AGREE OR DISAGREE (15%)

DISAGREE (10%)

STRONGLY DISAGREE (0%)

The consequences of Zambia's impending debt crisis will manifest in an unfavorable outcome for the mining sector:

STRONGLY AGREE (0%)

AGREE (25%)

NEITHER AGREE OR DISAGREE (50%)

DISAGREE (30%)

STRONGLY DISAGREE (0%)

The projected increase in the price of copper has been accurately forecasted:

STRONGLY AGREE (0%)

AGREE (80%)

NEITHER AGREE OR DISAGREE (15%)

DISAGREE (0%)

STRONGLY DISAGREE (5%)

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Website: www.cecinvestor.com
Email: info@cec.com.zm

COPPERBELT
energy

A TRUSTED and RELIABLE partner in energy




Since the early 1920s, mining has been at the core of Zambia's economy and energy its lifeblood. For a country ranked among the world's top copper producers and second in Africa, mining remains the country's top foreign exchange earner and contributor to Gross Domestic Product.

Powering and turning the wheels of this economic engine is the Copperbelt Energy Corporation Plc (CEC), which has for more than 60 years supplied power to about 80percent of the country's mines, including the wettest on earth. CEC is a Zambian incorporated power transmission, generation and distribution Company with interests in closely linked businesses, including optic fibre based telecommunications, in Zambia and the Sub-Saharan African region. The privately owned power utility is listed on the Lusaka Securities Exchange and is a member of the Southern African Power pool (SAPP).

With its business philosophy rooted in the need for a dedicated power supplier to an industry with unique needs, CEC boasts of a robust and extensive power infrastructure network spanning the entire mineral rich Copperbelt Province, and extending into the resource-rich Democratic Republic of Congo (DRC) - with whose national utility, SNEL, CEC jointly owns and operates the only interconnection linking DRC to the rest of Southern Africa.

Driven by a highly skilled, innovative and ambitious workforce, CEC's reputation goes before it. Be it for designing and operating transmission systems or supplying reliable power to bulk users, CEC is a partner of choice in energy.

CENTRAL AND EAST AFRICA

DRC - ETHIOPIA - TANZANIA

"Globally it has been tough conditions for the entire mining community. Several companies went under care and maintenance, so it had been quite a difficult period for the Copperbelt. In 2017, things have really begun to turn around and we are expecting many exciting new developments for 2018."

- Stephane Goupil, Country Manager — Epiroc DRC

Image courtesy of Ivanhoe Mines

East and Central Africa

Encouraging infrastructure developments and disturbing national politics.

East and Central Africa has not been immune from the rising tide of protectionism around the globe, and the implementation of restrictive trade policies in Tanzania has created an uncertain investment environment there. Further jurisdictional uncertainties have impacted investor security in other East African nations such as Kenya, where a rocky election period has created lingering questions about the country's stability and intentions to revise the mining code are further putting off investors. All in all, changes throughout the region have set an uneasy tone for 2018, but at the same time, rebounding prices have played a role in generating interest in this prospective and underexploited region. In general, the value of the resources sector as a driver for regional socioeconomic development is well understood by the region's nations. As commodity prices continue to rise, initiatives to promote the vast mineral potential of the region abound and key projects to support improved infrastructure and labor capacity are underway.

Kenya's presidential election, held in August 2017, was preceded by a large degree of apprehension as investors recalled the resulting violence from previous years' votes. Incumbent President Uhuru Kenyatta returned to office with just over 54% of the vote in what was called by international and local observers Kenya's most transparent and fair election in its history. However, the opposition candidate, Raila Odinga, met the results with claims that the electronic voting system was hampered by hackers, resulting in sparks of deadly violence around the nation. In November 2017, the Supreme Court voted to uphold the victory, but tensions continue to linger.

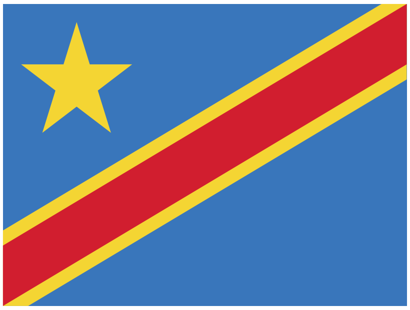
Nonetheless, a bullish global gold market bodes well for Kenya as a still relatively new mining jurisdiction, evidenced by activities including Acacia's continued exploration activities on its West Kenya gold project following the announcement of a high-grade resource that is likely to surpass 1.3 million ounces of gold. Goldplat's Kilimapesa mine, the country's largest gold operation, recently commissioned a new crushing plant, and a highly anticipated airborne survey of Kenya will provide investors with more information about the untapped potential in the country.

Continued developments in the infrastructure space could allow Central and East Africa to emerge as a strategic hub given its proximity to Middle Eastern markets, elevating the entire region's importance to the continent. A strong focus on regional integration has proven a highly positive development in encouraging synergies in developing key links such as the transportation projects which accounted for 46.5% of constriction projects in East Africa in 2016, and the recent revival of the US$11 billion Bagamoyo port project in Tanzania will likely assist in adding value to other smaller projects throughout the region.

Political problems like those in Kenya and Tanzania have caused some companies to shed their assets in problematic nations and to examine alternative jurisdictions like Ethiopia. Growth projections place Ethiopia as one of the fastest growing economies globally and the nation is committed to diversifying its economic strategy, which has translated to positive outcomes for miners operating in the region. In Ethiopia, gold and gemstones represent particularly exciting and under-explored areas of potential and its potash mineralization could make waves in the global markets. Potash in the ground of traditional producers like Russia and Canada may not occur until depths of 500+ meters; in Ethiopia's Danakil Depression such zones can be found as close to the surface as 50 meters.

The global return of confidence in the mining sector and rising commodity prices will inevitably translate to greater opportunity in the well-endowed East Africa region. Furthermore, the opportunity to service the region's burgeoning mining sector represents a strong base for further economic development. Providers across the value chain such as Rock Plant predict that swelling confidence will result in a surge in demand and are gearing up their capacity accordingly. "Right now, many companies are running machines down to the ground because they cannot afford to buy new equipment," said the company's director, Pritpal Roopra. "As soon as the situation stabilizes, these companies will be looking at buying more equipment, which is great news for Rock Plant," he added.

Large-scale infrastructure projects will be pivotal in determining the longer term potential of the region. Governments are positioning their countries to take advantage of their nations' rich natural resources by making necessary investments in both vital transportation links and the available skillset of the population. As is the case across the continent, the crucial dynamic to be determined going forward will be finding the balance between the needs of these rapidly developing nations and investor interests. 86% of the large-scale construction projects in the region are government-owned, underlying this fact. There are few better case studies to examine this issue with than the DRC, a nation well-know for its immense mineral wealth but equally for enormous challenges, the nascent jurisdiction of Ethiopia, profiled in our report for the first time this year and Tanzania, a well-established mining hub facing a crisis in its relationship with investors. •

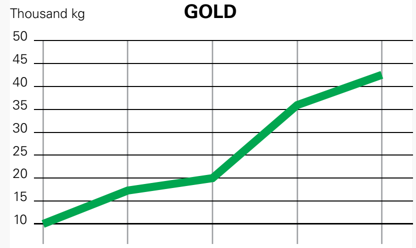


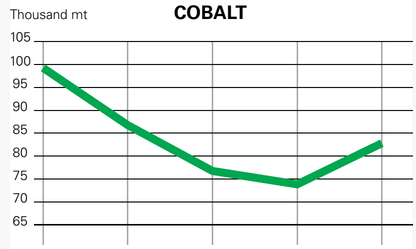
Democratic Republic of Congo

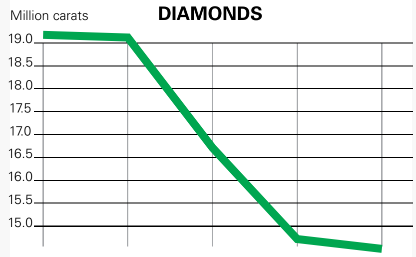
Population: 83,301,151
Land Area: 2,344,858 sq km
Official Language(s): French
Capital: Kinshasa
Head of Government: Prime Minister Bruno TSHIBALA (since 7 April 2017)
GDP (PPP): $65.02 billion (2016 est.)
Growth Rate: 2.4% (2016 est.)
GDP per Capita: $444
Economic Sector Breakdown: agriculture: 21.1%, industry: 32.7%, services: 46.3% (2016 est.)
Exports: $8.228 billion (2016 est.)
Imports: $8.671 billion (2016 est.)
Major Trade Partners: China, Zambia, SA, France

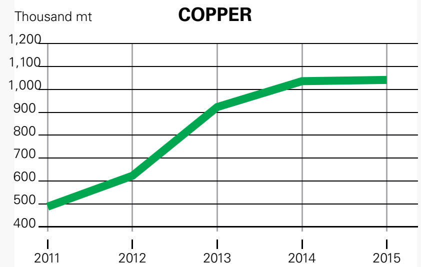
MINERAL PRODUCTION

SOURCE: BRITISH GEOLOGICAL SOCIETY









TAXATION RATES

SOURCE: PWC

A new mining code is currently being debated in the Senate

IBRAHIM INDEX OF AFRICAN GOVERNANCE (2017)

SOURCE: MO IBRAHIM FOUNDATION

2016 Rank (Out of 54)

48

2016 Score (Out of 100)

35.0

Safety & Rule of Law

28.2

Sustainable Economic Opportunity

31.4

Participation & Human Rights

32.7

Human Development

47.6

MINING SECTOR CONTRIBUTION TO GDP

SOURCE: AFRICAN ECONOMIC OUTLOOK

2015

22%

BUSINESS ENVIRONMENT RANKING IN AFRICA (out of 47 sub-Saharan countries)

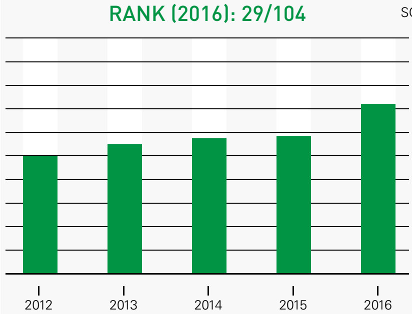
SOURCE: WORLD BANK

	2015
Ease of Doing Business	44
Starting a Business	8

FRASER INSTITUTE INVESTMENT ATTRACTIVENESS INDEX

SOURCE: FRASER INSTITUTE

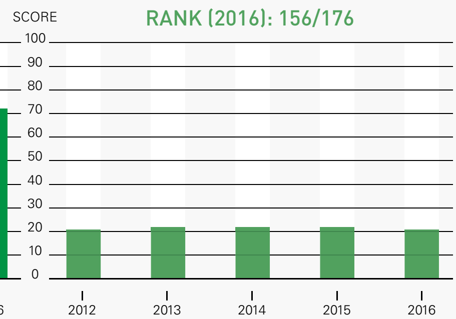
RANK (2016): 29/104



TRANSPARENCY INTERNATIONAL CORRUPTION PERCEPTIONS INDEX

SOURCE: TRANSPARENCY INTERNATIONAL

RANK (2016): 156/176



Hon. Pande Kapopo Celestin

Governor of Haut-Katanga, DRC

What is your strategy to encourage development in the Haut-Katanga region and what role will the mining sector play?
Peace is the guarantee of all sustainable development; this is the basis of our strategy to attract investors and serious entrepreneurs. Haut-Katanga is known to have been a mining region forever and represents the area of choice of the region. When there is a rise in metal prices, investors come, attracting direct investments from abroad; the middle class is created and the living conditions of the population have improved as the purchasing power increases.

How has the division of provinces impacted the mining sector?
The policy in our government was to bring the citizen closer to its administration, which is why we have dismembered the original provinces, but it should not really impact the mining sector.

What is your message to companies regarding their responsibilities to the environment?
I ask them to respect the mining code first and foremost. Ignoring the environmental principles we have set out can lead to a disaster. We have to make sure that there is a positive impact on the environment and economic operators adhere to it.

What updates in terms of energy developments have occurred in Haut-Katanga?
We are facing a very serious energy deficit because many mines and factories utilize what is available. We are actively working to increase our energy capacity through the activation of several hydroelectric dams, but we want to encourage greater investments in renewable energies, especially solar. We are currently in contact with a company that intends to install a 200 MW solar project, and we ask others who are in the industry to come here because the market is large and promising.

What final message would you send to investors about the overall potential in Haut-Katanga?
We need these large economic players to come and invest in all our sectors: mining, agriculture, energy, and transport. We welcome the assistance of investors from advanced countries with open arms for a partnership based on the integral development of our province. •

Hon. Richard Muyej Mangeze

Governor of Lualaba , DRC

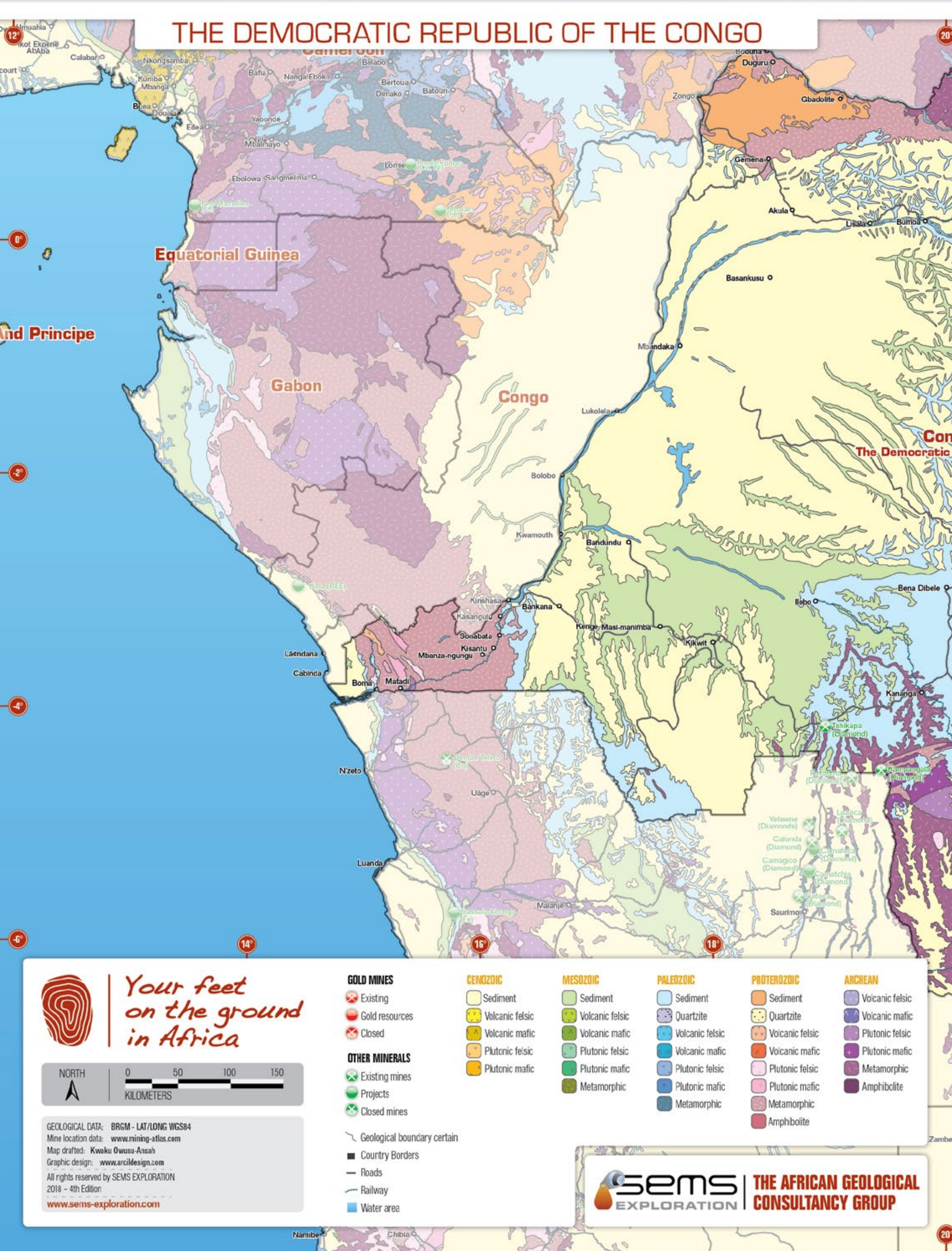
What can we expect from the new mining code?
We sent one of our elected officials to Kinshasa with our proposals, and our stance is that although we favor gains for the country, we also want to reassure the investors. We would like to maintain a certain balance so as not to frustrate or deter investment. We also know that when we negotiated the first mining code, the government was in a weaker position and we have come to realize that we are losing out a lot, our population is frustrated.

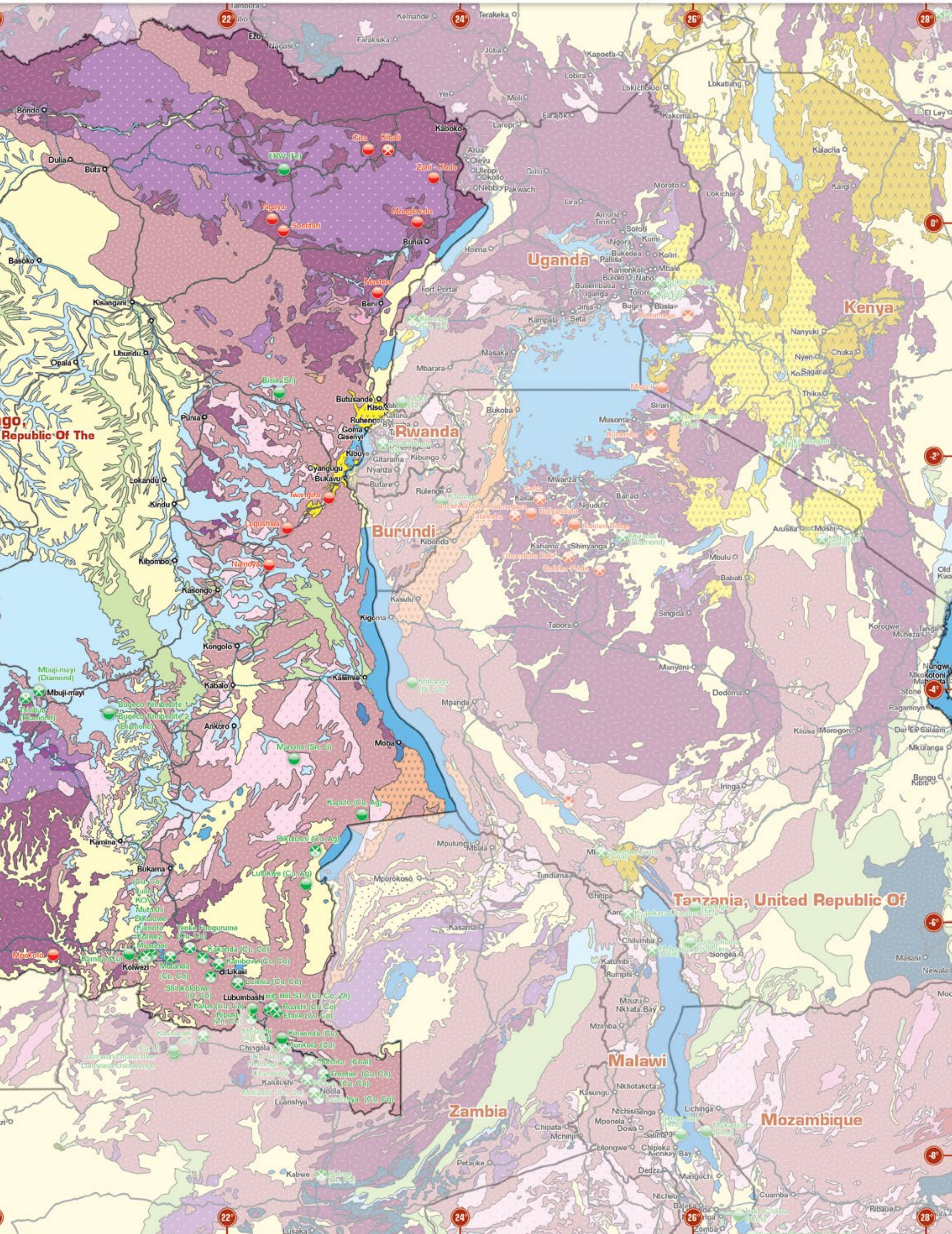
What specific initiative is Lualaba pushing in the new mining code?
We will insist on the province's broad jurisdiction over artisanal mining. Lualaba has around 100,000 artisanal miners. Because we do not always offer alternative employment, we have an obligation to value this sector for our young people. It is therefore important that the province be able to manage and promote these activities to improve the livelihoods of our people.

What issues do you expect to encounter in the distribution of taxes following the split of the Katanga province?
We has finalised talks with Haut-Katanga province concerning the allocation of taxes. The two essential taxes related to mining are the tax on the concentrate and road taxes. There is no problem with the concentrate tax; each province sets the tax on the minerals to be paid to the province of origin; where there was a small problem is determining the road tax. The road used by many operators goes through Haut Katanga, so compensation has to be made to both provinces. Currently, 70% is paid in the minerals' province of origin and 30% to the province of transit.

How is the Lualaba province working to improve its infrastructure to support the mining industry?
We have put a special emphasis on road development to connect the territory to the provincial capital of Kolwezi, and secondly we are endeavoring to build two new highways that connect the province to the two neighboring countries; this includes a 440 km road to Angola and a 132 km road to Zambia that will shorten the export route and avoid passing through the province of Haut-Katanga. This will allow our mining operators to export faster. •

THE DEMOCRATIC REPUBLIC OF THE CONGO





Uganda
Kenya
Rwanda
Burundi
Republic Of The
Tanzania, United Republic Of
Malawi
Zambia
Mozambique
22°
24°
26°
28°
0°
-2°
-4°
-6°
-8°
Kisangani
Bunia
Beni
Butembo
Goma
Gisenyi
Bukavu
Kigoma
Kalemie
Moba
Kampala
Jinja
Masaka
Mbarara
Musoma
Mwanza
Shinyanga
Tabora
Dodoma
Singida
Arusha
Moshi
Nanyuki
Nyeri
Thika
Iringa
Mbeya
Lubumbashi
Likasi
Kolwezi
Chingola
Kalulushi
Luanshya
Ndola
Kabwe
Kasama
Lilongwe
Monkey Bay
Mangochi
Mbuji-mayi
Kamina
Kindu
Kibombo
Kongolo
Kabalo
Ankoro
Manono (Sn, Li)
Kapulo (Cu, Ag)
Bisie (Sn)
Kibali
Namoya
Twangiza
Lugushwa
Masters
Ngayu
Somituri
Mongbwalu
Zani - Kodo
Buta
Bondo
Dulia
Basoko
Ubundu
Opala
Punia
Lokandu
Kasongo
Bukama
Mpokoto
Tenke Fungurume
Kakanda (Cu, Co)
Kambove (Cu, Co)
Luishia (Cu, Co)
Big Hill STC (Cu, Co, Zn)
Ruashi (Cu, Co)
Etoile (Cu, Co)
Kinsenda (Cu)
Konkola (Cu)
Frontier (Cu, Co)
Luanshya (Cu, Co)
Lubumbashi
Mpanda
Sumbawanga
Mbala
Mpulungu
Tunduma
Chitipa
Karonga
Chilumba
Rumphi
Mzuzu
Nkhata Bay
Mzimba
Kasungu
Nkhotakota
Salima
Dedza
Ntcheu
Petauke
Chipata
Mchinji
Masasi
Newala
Songea
Kilosa
Morogoro
Dar Es Salaam
Bagamoyo
Tanga
Korogwe
Babati
Manyoni
Kibondo
Kasulu
Bukoba
Kisoro
Kabale
Fort Portal
Hoima
Gulu
Lira
Soroti
Mbale
Tororo
Busia
Lokichar
Lodwar
Kakuma
Lokichokio
Kitale
Arua
Koboko
Yei
Juba
Faradje
Watsa
Isiro
Dungu

DRC

Intro-duction

The high-risk, high-reward paradigm of the DRC mining game is becoming increasingly palatable as evidenced by a buzz of activity across a range of commodities.

Flying above the vast bush just 30 minutes after departing from Lubumbashi, the country's second largest city, one may be lucky enough to catch a glimpse of a spectacular waterfall or witness a short summer downpour roll across the DRC's lush hills. Also from this vantage point, one will be unable to miss gazing down into one of the region's many mine sites, the neat lines of the pits standing in stark contrast to miles of surrounding wilderness.

While the views from above the Congo's famed geology may tantalize investors worldwide, the logistical challenges of operating in the country and its continued political instability remain fundamental deterrents to investment. However, the high-risk, high-reward paradigm associated with the DRC mining game is becoming increasingly palatable as evidenced by a buzz of activity in the mineral-wealthy nation across a range of commodities — although copper and cobalt undeniably remain the standout performers. Growing global interest in cobalt bears particular relevance given that the country contains roughly two thirds of the world's supply and the price of the metal has skyrocketed in recent years. The DRC is also the largest producer of copper in Africa and boasts some of the highest grades in the world. While the global average falls between 0.6% - 0.8%, some of the country's mines are estimated to contain grades higher than 3%.

Following the Supreme Court's decision to once again postpone presidential elections until 2019, the country faces an impending political crisis. President Joseph Kabila has been in power since 2001, but should have left office when his second term was completed in 2016. His refusal to leave has been met with periodic demonstrations of civil disobedience that have often ended in bloodshed. A marked increase in lawlessness across the country has garnered international media attention as various opposition groups and armed rebel forces battle for control over land and resources. AngloGold Ashanti and RandGold operate their Kibali mine in the country's eastern provinces, a region that continues to experience acute security concerns after serving as the chief battleground for the deadliest war in African history between 1998 and 2003. Furthermore, intense conflict has displaced 1.3 million people in the diamond-rich Kasai region after security forces killed tribal leader Kamuina Nsapu in 2016. A highly politicized civil society contributes to the sense that these tensions will inevitably persist across the country while the issue of the election remains unresolved.

However, the wider Katanga region, representing the country's share of the Central African Copperbelt, remains a relative bubble of stability where the majority of the most exciting developments in the mining industry continue to occur. "The past year has been a difficult year for the country due to the domestic political situation, however we have still seen economic growth of 9-10% in the Katanga region, thanks largely to a resilient mining sector," confirmed Yannick Ngandu, regional director for Katanga of Trust Merchant Bank (TMB).

Slow but ongoing developments in the region's infrastructure projects undoubtedly contributed to this growth, but an impending shift in the direction of mining legislation could unleash havoc in the area's long-established mining community. Nevertheless, the DRC remains a country high on the list of intriguing destinations for international interest, and in this report we explore some of the most pertinent questions for that community while highlighting developments across the value chain. •

DEMOCRATIC REPUBLIC OF CONGO

The Business Environment

Investors watch anxiously as DRC discusses a new Mining Code.

Just months after announcing its entry into the DRC, TSX-listed First Cobalt withdrew its exploration activities from the country, announcing that instead it would focus on its cobalt prospects in Canada. Citing a deteriorated investment climate, the company's CEO, Trent Mell, elaborated on the company's reason for the quick departure in a statement to Quartz: "With the signals we're getting, why would we invest our scarce dollars in a country that may not respect our investment rights?"

Poor governance and widespread corruption contribute to making the DRC one of the world's most challenging business environments, with the country falling to 48th out of 53 on the World Bank Group's 2017 Doing Business Report's rating of African economies. The regulatory framework does little to offer any consolation, and close to 50,000 small taxes make conducting due diligence nothing short of a nightmare.

Countless nuances in the system make tasks like accounting a dizzying feat, and although on paper there have been attempts at improving the environment through various compliances with internationally recognized standards such as the Organization for the Harmonization of Business Law in Africa (OHADA) principles, the challenge remains effective implementation on the ground. Yves Madre, partner for Deloitte DRC, explained that while the DRC's adoption of the OHADA in 2012 was influential in Deloitte's decision to enter the country, gaps remain: "OHADA regulation is highly inspired by French law, which is separate from the common law in DRC. Furthermore, the mining sector is very influenced by the Anglo-Saxon world as well as common law," he said. "For instance, when it comes to mining, there is OHADA law when dealing with subcontractors but also the specific mining provisions to follow as well, so the common mining law and the OHADA law define a subcontractor in different ways, which can certainly trigger confusion."

Some examples of the difficulties companies might encounter include keeping their records in the official language, which is French, or maintaining a six-column trial balance for each account. Human resources are another area to create cause for consternation. "On a technical level, unfortunately there has not been sufficient education and training in DRC in recent years, subsequently; many job opportunities that should be occupied by Congolese nationals become expatriate jobs," said Stephanie Jacobs, managing director of TIAfrica, a firm which assists companies with compliancy. "Some investors find it very challenging to respect the permitted ratio of expatriates to nationals for this reason. Obtaining the required skills whilst maintaining the stipulated local labour compliment in your workforce is, therefore, very difficult to attain," she said.

> *"The DRC has many blurry spaces, which is why the life of the business community becomes difficult.*
>
> *- Lysa Munkeni, Managing Partner, ACF Conseil"*

"Investors need to find an administration expert to help them," advised Xavier "Jack" de Longueville, regional director for Africa of Robinson International, soon to be the only ISO certified lab for exportation in DRC. "We have subcontracted some of our human resource and government relation services to a specialized company. They help service companies like Robinson International so that we can concentrate on our business without being inundated by administration."

BCDC: THE BENCHMARK FOR BANKING

IN THE DEMOCRATIC REPUBLIC OF CONGO

BANQUE COMMERCIALE DU CONGO
Building the future

BCDC has been supporting the Congolese economy and people since 1909. Stable and reliable in a highly challenging market, with its deep understanding of the Congolese economy and its exacting standards of management, BCDC has always known how to take advantage of its structural strengths and of cyclical opportunities. Its profitability, the best in the market, tells its own success story.

Like the elephant that stamps its logo, BCDC is a robust institution. With a 100-year track record, it inspires respect in the DRC and beyond. The long-term banking partner of all the major players in the Congolese economy, public and private (including mining and energy), BCDC has, over time, been successful in adding three other lines of business. Over the years, the Financial Institutions & Banks (FIB) line has carved out a reputation for quality with national and international institutions operating in the DRC. The SME market has been expanding for several years, while the Retail and Private Banking line has focused on the retail market, ranging from VIPs to employees, the self-employed and professionals.

UNFAILING CORPORATE BANKING EXPERTISE

Across and in addition to these lines of business, what sets the trading room apart is its professionalism and its unique, innovative position in the Congolese banking sector, primarily for corporate and institutional customers.

The rollout of these additional activities combines with the bank's comprehensive network across the DRC to deliver a service made all the more effective by the bank's governing principle of optimisation of resources, both human and financial.

HIGH-QUALITY FINANCIAL INFORMATION, PRODUCED IN ACCORDANCE WITH INTERNATIONAL FINANCIAL REPORTING STANDARDS (IFRS)

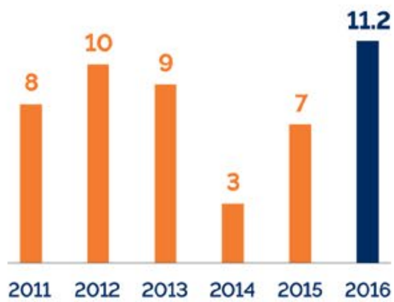
As part of this requirement of good governance, BCDC has published its financial statements in accordance with IFRS Standards since 2014. One of the first to do so in the DRC, this has enabled the bank to achieve a level of accuracy and integrity without equal, in particular for loans, provisions, the long-term benefits granted to staff, and for fixed assets, which are assessed at their appraised value and not on historical cost.

IN 2016, DESPITE A 30% DEVALUATION OF THE CONGOLESE FRANC, NET PROFIT REACHED RECORD LEVELS

This combination of best practice and expertise is reflected in levels of profitability all the more exceptional that they have been on target for the last ten years, despite the fact that regulatory constraints and economic situations can vary greatly. In 2016, despite the devaluation of the Congolese franc by more than 30% against the dollar, net profits hit a record $11.2 million. And these profits have never been achieved at the expense of fixed capital, which stood at $81.9 million in 2016 (compared to $73.2 million in 2015) after distribution of dividends amounting to $5.7 million. The same goes for net banking income, which was $80.2 million in 2015, rising to $93.6 million in 2016.

EVOLUTION OF THE NET RESULT

Net profit in USD millions



In short, BCDC is the bank that inspires confidence, the bank in which investors and major corporations place their trust.

"BCDC: THE BANK YOU CAN TRUST IN THE DEMOCRATIC REPUBLIC OF CONGO"

www.bcdc.cd

> *The mining industry does not have the financial capacity to make these critical developments and it is the state's responsibility to build the foundation for these industries. The mining industry would be the primary user of all these commodities from local businesses, but right now DRC does not have the right quality or quantity of product, equipment, people or businesses to keep the mining industry alive without importing.*
>
> *- Miles Naude, General Manager, MMG*

While the task of doing business in such an intimidating environment may be daunting, there is always opportunity in adversity and several companies like TIAfrica have sprung up that offer unique services aimed at helping investors.

Ultimately, institutional reforms geared towards supporting a solid macroeconomic strategy will be critical to creating a sustainable business environment for all sectors to flourish. "We need to support the capacity of smaller companies to supply consumables and other items into the mining sector to promote a healthier industry overall," said Miles Naude, general manager of MMG, which acquired the Kinsevere mine in DRC in 2012. "It is not the job for the mining industry to do grassroots development of these industries, however, discussion needs to happen between the private sector and the government to change the regulatory framework to the benefit of all the different industries."

While broad, systemic changes may be profoundly needed, as the most significant sector in the economy the laws that govern the mining industry are also of vital importance and the DRC has at long last reached the brink of introducing changes to its existing mining code. Furthermore, the realities of the break up of the country's provinces for the mining sector are still not fully understood, while the banking sector has made some strides in offering modernized financial services.

New Provinces Bring New Layers of Uncertainty

In 2015, the DRC's 11 provinces became 26, and Katanga was carved into four new regions including Haut-Katanga, Lualaba, Tanganyika and Haut-Lomami. The strategy behind this approach is theoretically sound, as Rawbank's regional manager of Greater Katanga Benoît de Carbonnieres points out: "When controlling a small territory compared to a large territory, more time can be dedicated to each area which will generate modernization and the development of infrastructure meaning the break-up of the provinces will be more beneficial in the long-term."

While decentralization could benefit the country's long-term development, the full, direct implications of the newly delineated borders for the mining community still remain to be determined. Already there have been some political tensions between the two key mining jurisdictions, Haut-Katanga and Lualaba, despite claims from both governors that the relationship between their respective capitals, Lubumbashi and Kolwezi, is an amicable one. In April 2017, Minister Kabwelulu sent a letter to leading mining companies including Glencore and Ivanhoe with instructions to relocate their offices from Haut-Katanga to Lualaba where their assets are based. The motive for the letter stems from the battle for revenue between the respective provinces because, while the mines may be based in Lualaba, the taxes and royalties are still paid to Haut-Katanga where the companies have their administrative headquarters. "Going forward, it appears now that Lualaba will begin to take the lion's share of tax revenue because many of the operations are based there," explained Lysa Munkeni, managing partner of ACF Conseil, a Congolese financial advisory firm. "There is also a double-counting situation because often the tax authorities in both jurisdictions will try their luck and attempt to collect tax from both the headquarters in Lubumbashi and the operation in Lualaba," she said.

In fact, when examining the former Katanga region, the bulk of mining assets are located in what is now Lualaba. However, companies ranging from major producers to service providers and banks have traditionally concentrated their regional headquarters in Lubumbashi — a fact which may soon change. "The separation of the provinces has not yet had an impact in terms of bureaucracy, but slowly we are beginning to experience changes. If we do begin to see shifts in bureaucracy between the independent regions, we might have to move some resources to these areas," confirmed Jonathan De Witte, regional manager for Comexas Africa.

Rumors have been circulating that that the region's significant annual event, DRC Mining Week, may also relocate to Kolwezi in coming years and a flurry of activity in the construction of hotels and related infrastructure suggest that the town is indeed gearing up to meet the task of hosting new investors. History shows that it is not uncommon in the country for different mining hubs to emerge and collapse with the rise and fall of different mines, evidenced by ghost towns like Manono, Likasi, or even Kolwezi itself where the remnants of the past are apparent in dilapidated buildings that hint at formerly better days. While Lubumbashi is now a vibrant and bustling community marked by several luxury hotels and restaurants to cater to the many visiting investors, it will be interesting to see whether in the years to come the city falls back into a sleepy administrative town and Kolwezi takes its place as the country's mining capital.

Investors Warn New Mining Code Could Upset 15 Years of Prosperity

The DRC introduced its current mining code in 2002 with the objective of attracting investors, an initiative that was largely considered successful given the subsequent growth of the industry since then. However, amid complaints from the government that it has not seen enough tax revenue from the industry, the country is now revisiting its Mining Code — a move that has been met with much trepidation and fierce opposition by the community of international mining companies with long-term vested interests in the country. "We need to strongly caution our country decision makers to look at the real challenges to be addressed, which are preventing our mining industry to create and distribute wealth to all stakeholders more effectively: Poor infrastructure, energy deficit, and lack of good governance," said Louis Watum, Image courtesy of Ivanhoe Mines

managing director of Ivanhoe Mines DRC operations. "The current mining code clauses which helped attract much needed investment in the country over the past 15 years should not be tampered with, instead the government should build sufficient institutional capacity to manage the implementation of the current mining code more effectively."

Current proposed changes to the law include increasing the corporate tax from 30% to 35%, and doubles the state's free share to 10%, in addition to introducing a profit-windfall tax. The new law would reduce the period during which contract stability is guaranteed to five years from 10 years, and royalties on base metals like copper and cobalt are set to increase from 2% to 3.5%. Furthermore, metals classified as "strategic" could see rates increase to as high as 5%. This new "strategic" classification would allow the Congolese government "the flexibility to face unforeseen developments in the international market if the international economic situation demands it," according to a transcript of Minister Kabwelulu's statement in early January 2018 to the Senate, where the law is currently under view. If passed by the Upper House, it will then be sent to President Kabila to be signed into law.

Existing stability clauses would allow companies with valid mining contracts to avoid most reforms for 10 years, but the hike in royalties would be immediate for all projects. The strategic classification bears particular relevance on metals like cobalt or tantalum given the worldwide drive towards the electrification of vehicles and lithium ion batteries. As the country contains a significant proportion of the global cobalt supply, perhaps it should come as no surprise that the government has begun to take a hardline approach on its taxation policy. If the fundamentals of cobalt supply and demand remain in their current state, the DRC government is well positioned at the bargaining table.

Bankers in the DRC: Driving Innovation

The banking sector in DRC certainly faces an uphill battle. A recent study found that the uptake of banking services in the country hovers at around 8-10%, while the average in sub-Saharan Africa is upwards of 25%. This fact is largely thought to be underpinned by residual mistrust in the banking system after the hyperinflation crisis the country experienced from the late 1980s into the 1990s, which saw rates as high as 23773% in 1994. While nowhere near that high today, inflation remains a problem in DRC. The low commodity prices from recent years and ongoing political turmoil have done little to help its already hurting economy where there is low confidence in the Congolese franc, which fell by 22% against the dollar in 2017. To address a growing government deficit and battle further depreciation of the nation's currency, the Central Bank of

"The tax environment has to remain stable for five to 15 years, otherwise investors will take their business elsewhere as they cannot be confident in their return on investment. However, mining projects continue to develop, meaning the current level of taxation and the mining codes are adequate."

- Benoît de Carbonnieres, Regional Manager, Rawbank

Congo (BCC) has maintained tight austerity measures and insists that mining companies repatriate 40% of their export earnings.

Notwithstanding adverse fiscal circumstances, the banking sector in DRC has made strides in recent years, due in large part to the efforts of locally-focused banks such as BCDC, TMB, and Rawbank. Many large banks with stronger international credentials such as Citibank and Standard Bank cater solely to corporate clients, and in fact do not offer commercial services. Yet, the introduction of new retail services such as mobile banking like TMB's Pepele Mobile is creating a stronger financial sector that will also directly benefit the mining community. "Our plan with Pepele Mobile was both to provide a digital solution that meets the needs of the digital market, and also to find a way to support the digitalization of B2B transactions," explained Yannick Mbiya Ngandu, regional manager of TMB. "Our expectation is that the migration of economic activity to digital platforms will increase transparency and support access to finance for companies, in particular SMEs who all too often suffer from a lack of access to finance due to poor availability of quantitative data."

Supporting the SME sector is of critical importance to the developing the capacity of local value chains. "There is a law (not yet in force) regarding the subcontractors in DRC that wants to boost local SMEs to participate in the mining sector," elaborated Michael Demey, regional manager of the Katanga area for BCDC. "The ongoing discussion on the revision of the mining code also emphasizes on that local content." Local players like BCDC, which was founded in 1909 and as such is the oldest bank in the DRC, offer an array of training, advisory, and financial services to local contractors in this vein. However, these local banks have the capacity to also service international investors and the wider mining community. While large banks can provide greater access to the capital needed for large-scale mining operations, local played arguably offer a distinct advantage through their knowledge of the country's local financial framework as well as foreign exchange regulations. "Through close follow-up on the transactions related to import and export, we protect the interest of our client and by doing so, the interest of the bank," added Demey.

Despite the many challenges that the DRC presents to the international investor, an innovative local finance sector continues to provide a strong system of support that will be crucial going forward as the country navigates an unclear future. •

DEMOCRATIC REPUBLIC OF CONGO

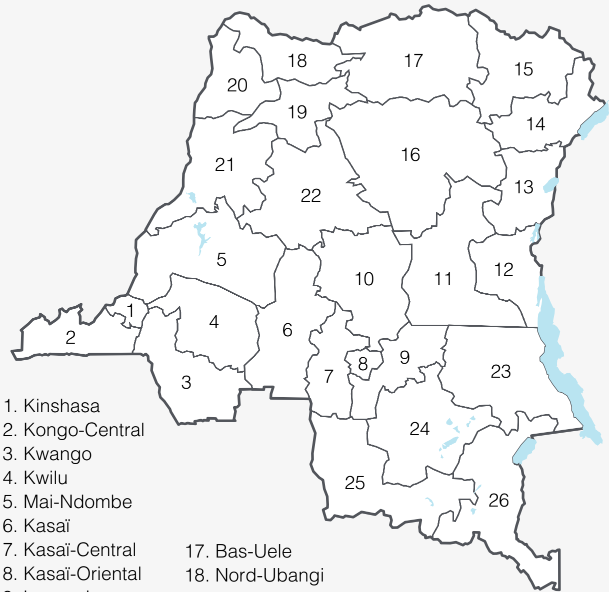
Production and Exploration

Cobalt and copper dominate, but exploration reveals further potential.

Copper + Cobalt:
A strong tradition holds true

The decline of the copper price saw the DRC producing only 986,582 tonnes in 2016. However, the recent uptick has motivated producers to once again ramp up production and in 2018, the country aims to produce 1.5 million tonnes of copper. While its projects had been inactive since 2015 to undergo significant refurbishments, Glencore's many mining activities though its subsidiary Katanga Mining, which operates through two joint ventures — the Kamoto Copper Company (KCC) and DRC Copper and Cobalt Project (DCP) — will prove critical to reaching this number. However, the company's production of cobalt is perhaps even more significant given the state of global supply, as activities coming back online mean the company will produce an expected 11,000 tonnes of cobalt in 2018, causing analysts to rethink a suspected shortfall in supply — a development investors have been happy to note has not impacted the projected price.
While it will not come into play in 2018, Ivanhoe Mines' Kamoa-Kakula project, located in Lualaba, represents the world's largest undeveloped, high-grade copper discovery, and could also be a regional game-changer. The company's polymetallic Kipushi project, located in the Haut-Katanga province, is a brownfields project that has existed since 1924 and has the potential to be the highest grade major zinc project in the world in addition to its credentials in copper, silver, and germanium.
SOMIKA has achieved fully installed capacity for 20,000 tonnes of copper cathodes and 2,000 tonnes of cobalt hydroxide production, which will allow production to reach full capacity in 2018. Also in 2018, the company has a planned copper cathodes production expansion of 20,000 mt/y on the site of its PE 2590 concession.
Several Chinese investors have also joined the slew of international operators in the region, including China Nonferrous Metal Mining Group (CNMC), whose Deziwa copper concession may rival Ivanhoe's Kamoa, and the Jinchuan Group through its purchase of South African-based mid-tier Metorex, which owns Ruashi mine located on the outskirts of Lubumbashi. In exchange for a stake in the Sicomines project, China Railway Group and Sinohydro Corp agreed to build US$3 billion worth of roads, railways and other infrastructure. The world-class Tenke Fungurme copper cobalt-mine, which has proven resources 3.8 million tonnes of contained copper, changed hands to China Molybdenum Co Ltd (CMOC) in 2016. The company purchased the 56% majority stake from Freeport McMoRan Inc for $2.65 billion in May 2016 after the state mining company Gécamines dropped its objections to the transaction.
MMG's high-grade asset, the Kinsevere mine, represents the company's broader strategy to extend its footprint in the African continent as part of its objective to become a US$20 billion company by 2020. MMG has been mining copper oxide ore, but will explore a sulphide option which could extend the mine's life until 2033 as opposed to 2024. For the third year running, the company expects Kinsevere to produce 133% over its nameplate capacity, reaching a total of 80,000 tonnes of copper.

Changes in the DRC Provinces



1. Kinshasa
2. Kongo-Central
3. Kwango
4. Kwilu
5. Mai-Ndombe
6. Kasaï
7. Kasaï-Central
8. Kasaï-Oriental
9. Lomami
10. Sankuru
11. Maniema
12. South Kivu
13. North Kivu
14. Ituri
15. Haut-Uele
16. Tshopo
17. Bas-Uele
18. Nord-Ubangi
19. Mongala
20. Sud-Ubangi
21. Équateur
22. Tshuapa
23. Tanganyika
24. Haut-Lomami
25. Lualaba
26. Haut-Katanga

The Conflict Minerals: Tin, Tantalum, Tungsten and Gold

Given their use in constructing modern electronics as pervasive as smartphones, tin, tantalum, tungsten and gold (3TG) are some of the world's most important — and also controversial — minerals. Section 1502 of the U.S. law known as the Dodd-Frank Act requires companies that use any of these materials in their activities to carry out a due diligence to determine the source of the supply, and if that source is the DRC, the company must be able to prove that the sale of the metal did not aid in financing the region's ongoing conflicts. The term conflict minerals thus is introduced to describe minerals that are used to perpetuate activities around violent crime, whether it be money laundering, financing arms sales, or to enforce some form of abuse of human rights, all which have been unfortunately deeply entwined with the DRC's vast wealth of resources.
While there are currently attempts within the U.S. to repeal the Dodd-Frank regulations, in January 2012, the EU will enter into force a new law — the Conflict Minerals Regulation — that applies the same responsibilities to companies in terms of securing their supply chain. Furthermore, many prominent actors in the private sector such as Apple have made firm proclamations that they will not use suppliers associated with conflict minerals regardless of any changes in regulation.
Despite the obvious challenges, companies willing to undertake the risks of undergoing such an arduous audit continue to source 3TG from the DRC. The country has several operating

Louis Watum

Managing Director
Ivanhoe Mines DRC Operations, DRC

Ivanhoe Mines has been in the DRC for 10 years now. What is your expectation for 2018?
Thanks to an exceptionally talented and disciplined team of geologists, the Kamoa copper deposit was discovered by Ivanhoe Mines in 2008. Later in early 2016, Ivanhoe Mines discovered the Kakula deposit approximately 10 km south-west of the Kamoa deposit, making the combined discoveries together to be ranked the world's largest, undeveloped, high-grade copper discovery ever made. We are now exploring Kakula West, which is also very promising in terms of its near-surface source of high-grade copper mineralization that could be incorporated into the early years of the Kamoa-Kakula mine plan. We have already sank twin declines to reach the ore at Kansoko mine, our initial Kamoa copper discovery, and are now fast tracking the development of Kakula mine with sinking of twin declines currently underway, pre-feasibility study in progress, and surface infrastructure construction due to start in 2018.

How does Ivanhoe Mines mitigate the risks of exploring in a country with a risk profile like the DRC?
Discovering significant deposits like Kamoa is not something that happens by itself; there are several necessary ingredients that need to be combined in order to discover something of this magnitude. Firstly, the mining code introduced in 2002 allowed investors to feel secure in investing in the country since the fiscal regime was straightforward and had built-in stability clauses extending over a 10 year period. Given the natural mineral endowment of the country money was therefore naturally rolling in because it felt like a safe environment for investors in search of good returns. Secondly, the political stability over the past 15 years created a platform where FDI started coming into the country across all sectors the economy. Finally, it really comes down to the work done by our amazing geologists under the leadership of Robert Friedland and Lars-Eric Johansson. Even the most sophisticated exploration techniques like airborne or satellite ones cannot possibly beat the talents of a great geologist that has the feel for a good spot of land. •

gold mines and development projects concentrated in the eastern region, including Canadian-based Banro's Twangiza and Namoya mines and exploration assets at Kamituga and Lugushwa that have a combined inferred resource of 5.08 million oz. Vector Resources is developing its Adidi-Kanga gold project adjacent to the Randgold / AngloGold Ashanti JV, the Kibali mine, which continues to show strong production figures posting approximately 610 000 oz in 2017. Junior company Ortac Resources has identified high-grade resources at its Akyanga project, also in the South Kivu region.

One of only four countries producing tantalum, in 2016 the DRC produced 450 tonnes of tantalum, representing 40% of global supply. Tungsten is also found in abundance in the eastern region of the DRC, and the country is the largest producer of tin on the African continent and the ninth largest producer of the metal in the world, producing 4,100 mt/y. Alphamin Resources, which recently listed on the JSE in addition to its primary placement on the TSX, continues to develop its Bisie mine in the south-east of the North Kivu province with the goal of producing conflict-free tin by 2019. The deposit is one of the largest tin ore-bodies in the world, and production figures could double the country's total export value.

Lithium

The hype around the potential for batteries to provide a cleaner and more efficient solution for storing energy has made lithium the hot commodity of the moment across the mining world. Historically, while the DRC has more than its share of interest in the battery metals department through its impressive cobalt reserves, the country has not been associated with lithium. However, ASX-listed AVZ Minerals' Manono project has profoundly changed that notion. The company has been making waves in the market after it announced that it had discovered potentially the world's largest lithium pegmatite deposits in the Tanganyika province.

The town of Manono, once enriched by the historic tin mine that operated there between 1919 and 1982, has suffered significant economic distress since the closing of the original operation. Now, new investments in infrastructure have begun to revitalize the small town. One of AVZ Mineral's partners, Dathomir Mining Resources, will assist in rehabilitating approximately 500 km of road that will link Lubumbashi to Manono at an estimated cost of US$285 million. "AVZ Minerals'

Image: GBR

Manono project has huge implications for the local population. We were very particular when we structured this project to make sure that wealth was spread throughout different villages, towns, and families," said Nigel Ferguson, executive director of the company. "Within the town itself there is increasing construction activity, including hostels where people can stay now."

AVZ will commence a 20,000 meter drilling program in January 2018 and could be in operation as soon as 2019-2020. And now that the lithium craze has spread to the DRC, several new investors have flocked to the site of AVZ's discovery to snatch up nearby concessions, in particular investors coming from China. Others have begun to reevaluate their exiting tenements, and SOMIKA, in addition to expanding into tungsten, zinc, lead, and manganese, has identified lithium in its tin and tantalite concessions, which the company plans to explore further in 2018. •

DEMOCRATIC REPUBLIC OF CONGO

Infrastructure

The vast size of DRC requires massive investments in transportation infrastructure, while its fantastic hydro- and renewable- power potential demands exploitation.

Logistics and Transportation

The vastness of the DRC makes logistics exceptionally challenging, particularly given the state of the infrastructure. As the country begins to export increased volumes over the next year, the price of logistics can be expected to rise because the country's existing transportation links simply do not have the capacity. Developing long-anticipated railways might provide some relief. "By not developing rail as a logistical solution, the permanent imbalance that exists between export and import will only increase," said Amaury Luyckx, business development manager for Polytra. "As production in DRC increases with developments such as KCC coming back online, trucking prices will increase, and as a logistics solution provider, we cannot afford to follow this price game. We need to find alternatives and we believe rail will certainly be part of the alternatives we offer. It is not in competition with the roads, because even with the combined contribution it will still not offer enough capacity."

While little has been done in recent years to upgrade the railway, upcoming projects backed by the World Bank should help to improve international connections between the DRC and Angola and though Zambia into the Southern Africa region. "We are also hoping to expand to Dilolo, which shares a border with Angola because we are hoping to be involved with a railway project there," confirmed Jean-Paul Tshiendela, branch manager of ProSteel, a DRC-based subsidiary of South African company BSI Steel.

At present, the World Bank has 29 active projects representing a total of US$3.8 billion worth of investment, 62% of which are categorized under infrastructure and sustainable development. The Bank's recently announced US$600 million investment into an infrastructure project to facilitate trade in East and Central Africa that will also benefit the DRC. The project aims to provide a railway route to the sea for the DRC, as well as Burundi, Tanzania, and Zambia and will cut the cost of transporting goods from the Dar es Salaam port by as much as 40%.

Nonetheless, the largest obstacle to developing these critical infrastructure projects remains attracting financial backing, although high levels of Chinese investment have certainly had an impact, such as China Railway Group's US$3 billion investment in various infrastructures in exchange for a stake in Sicomines, a model the government wishes to experiment with more. Within Central Africa in 2016, Chinese finance funded 33% of construction related activities, and 50% of projects were constructed by Chinese builders.

In general, the wealthier Katanga area has seen the most improvements. "In terms of the roads, we now have a tarred route connecting Lubumbashi to Kolwezi and some of the feeder roads are being rehabilitated in terms of grading and maintenance," said Tobias Posel, managing director of GeoQuest.

However, as investors increasingly look to access the country's mineral potential available beyond the Copperbelt, the task of accessing these areas becomes absurdly difficult due not only to the lack of infrastructure, but also the security concerns. To access the volatile eastern region of the country, for example, one common path if flying is not an option is to leave the DRC and enter through Rwanda. "Usually we only take a project where we can go by car so as not to be dependent on a plane, and because of that we tend to stay in Katanga," said Pythagore Manoliadis, managing partner of Benco, a construction company based in Lubumbashi. "We have undertaken projects outside of the province, but it was much more challenging due to logistics."

Yet, if the desperately needed injections of capital into developing the transport networks outside of Katanga can be sourced, the country's entire mining industry could be elevated to a new level. "The infrastructure to support the implementation of new mines will be critical (to the entire country, particularly in the Kivus), specifically in terms of energy and roads," said Amaury Lescaux, managing direction at SMT, the official distributor for Volvo. "We hope examples such as Banro and Alphamin will be followed by many new companies and investors so that Kivu can become a second Katanga."

Power

In September 2017, Chinese investment-backed Sicomines was ordered to stop the export of its copper and cobalt products. The level of processing undergone by the metals was deemed by the government to be unacceptably low, though, as a rule, the country has never been able to implement an effective ban on unprocessed ore because of its massive power deficit. Access to reliable power unfortunately remains an unnecessary irony in the DRC because, while the nation has the hydroelectric potential to power all of Africa — estimates put its energy potential at 100,000 MW or 13% of global potential — this is a development that remains largely unrecognized and one that needs to occur for the minion sector to reach its full potential. "In Haut-Katanga there is a 400 MW deficiency within the mining sector," Cecile Amory, director general of Mining Contracting Services Congo (MCS-C), a mining contractor located in Lubumbashi. "This is a critical problem so they are importing energy from Zambia but it is still not really enough for mining in Katanga."

Indeed, companies such as MMG have contracts in place with outside providers like Copperbelt Energy Corporation (CEC) in Zambia to mitigate the risk of disruptive power cuts that can also raise the operating costs for a mine. CEC owns the interconnector between the two countries in partnership with the DRC's national supplier, SNEL. The interconnected completed an expansion in 2016, allowing the company to transmit more power to the DRC, and while CEC saw a 15% drop in domestic sales during the copper downturn in 2016, its revenue was sustained by an 86% rise in power trading sales largely coming from its operations in the DRC, representing a figure of US$355 million. "If you look at CEC's objectives today, we also want to focus more on our role in the southern African electricity market, particularly in the DRC where we see a considerable growth in the country's mining sector presenting us with an opportunity to contribute to strengthening and expanding power infrastructure in that country," said Owen Silavwe, managing director of CEC.

Several factors will lead to an increasing need for the development of in-country capacity, however. New mines like Kamoa entering online in coming years only increases the number of players competing for a diminished supply of power. Furthermore, recovering commodity prices mean that mining companies will want to ramp up production to take advantage of attractive returns. TFM, for example, wants to increase its current consumption of about 100 MW to 400 MW, which would triple their production. In this vein, the 2014 liberalization of the power sector in DRC offers huge opportunities for private players to enter the market and tap into the massive energy potential hosted by the country. "Alternative players in the energy sector are becoming established and taping into a broad list of donors, grants and other money sources to develop greater power capacity," confirmed Tobias Posel, making director of GeoQuest.

Examples include Sinohydro and China Railway Group's US$660 million Zongo II Hydropower project which received financing from the Export-Import Bank of China and will provide an addition 150 MW of power. The enormous hydroelectric dam known as the Great Inga Dam project could deliver more than 40,000 MW. Production has eight different development phases; Inga I and Inga II were completed in 1972 and 1982 respectively, and the current stage, Inga III, has already seen upwards of US$14 billion in investment, part of which has been financed by South Africa which will purchase half of the end production capacity, or an expected 2,500 MW. Another US$73 million in technical assistance grants have come from the World Bank's International Development Agency (IDA), however, this funding was suspended following an announcement that the government and the World Bank differed in their ideas of the project's strategic direction, resulting in delays that mean the project will not see generation until 2024-2025 instead of the originally planned 2020.

Nonetheless, the success of various projects will hopefully motivate more investors to explore the various power projects and energy opportunities available in the country, such as solar, which is grossly underutilized as well. Also, the rising price of commodities will provide greater incentive to back the country's many needed developments. "There is no doubt that the industry has been suffering because of the energy issues and the increase in production will augment this challenge. However, there are many power sources that are being rehabilitated," reaffirmed George Ioannou, business development manager for Africa for Polytra. "For example, SNEL has been cooperating with the mining industry to relaunch the Madigusha Central," he said.

The Belgian-based logistics company has been operating in Africa since 1974 and is moving the majority of the transformers and equipment for the project to rehabilitate Madigusha Central. •

"In order to increase power transmission capacity and guarantee a seamless flow of power, we successfully commissioned the dual-circuit second 220kV Zambia-DRC interconnection in March 2016, bringing the total capacity from 250MW non-firm to 500MW firm."

Owen Silavwe,
Managing Director,
Copperbelt Energy Corporation Plc (CEC)

DEMOCRATIC REPUBLIC OF CONGO

Conclusion: Finding Success as a Business in the DRC

There is no denying that the DRC represents one of the most challenging operating environments in the world. Many have tried and failed to navigate the extreme conditions, yet there are several businesses, large and small, that have managed to thrive amidst seemingly impossible odds. The Forrest Group, a family-owned, diversified group of companies centered around the mining industry, has been operating in the DRC since 1922, meaning that the company has enjoyed nearly 100 years of uninterrupted activity. Congo Store started 32 years ago as one small store selling second-hand clothes and some household items, but today is cautiously expanding into construction. SOMIKA initially entered the county in the 1990s to work in trading, but as expanded to included a portfolio of businesses ranging in activities from mining multiple commodities to farming and agriculture.

Chetan Chung, managing director of SOMIKA, explains his methodology: "To have a greater chance at success, you need to view the DRC as your home. If you come in with a short-term mindset with an objective of merely making fast money, you might succeed for a short amount of time but you will miss out on the long-term benefits. Ultimately it is all about your connection with the place and people that will assist you in finding long-term success."

There are essentially two strategic approaches to making a profit in the DRC. Many companies have tried the get in, get out, fast approach and this is where a breakdown tends to occur. Without proper knowledge of the country's many idiosyncrasies, failure is much more likely, and without offering something in return, the Congo is liable to swallow you whole. Respecting the environment and the people who live there by taking time to understand the country's needs rather than merely taking from it will allow for mutually beneficial projects — an observation supported by the many companies that, despite the risk, have begun to unlock the DRC's incredible mineral potential. •

DRC – EXPERT OPINION

Operating in Tanganyika Province

Graeme Johnston
Project Manager
AVZ Minerals – Manono

When touching down on Manono's dusty airstrip, a leisurely 90 minute flight north of the DRC's second largest city Lubumbashi (a hove of frenetic copper and cobalt exploration activity at the moment) you might be forgiven for thinking that you had arrived in the land that time forgot. Driving out of the airport, past the UN camp and into the main part of Manono can be unnerving to those like myself who have not spent much time in the centre of Africa. However, the incongruities of driving past various international aid outlets and NGO compounds into the wide, old fashioned Belgian mango tree lined boulevards with their elegant, but sadly, run down houses only serves to highlight the long history of colonial involvement in the country and its more recent turbulent past.

Logistically the town of 30,000 plus souls seems to be completely isolated from the metropolis of Lubumbashi and indeed the dilapidated road to the provincial capital does nothing to dispel that idea. However, positive vibes coming from not only the AVZ's current exploration activities, as well as the recent signing of an agreement to start rebuilding the main road to Lubumbashi commencing this April, add to the air of excitement seeping through the old town. Exploration and mining is back on the agenda.

Exploring an old tin and coltan mine that operated from 1919 to 1980 has been a fascinating experience. The original operators used a simple free dig, truck and washing process, utilizing only the most weathered parts of the pegmatite. Here the feldspar, that is one of the three main minerals that make up the orebody, with quartz and spodumene being the other two, weathered down to a potassium rich clay. This led to the disintegration of the rock allowing it to be picked up using steam driven excavators (their remnants are still visible today) and trucked to any of the four washing plants situated evenly along the eastern edge of the orebodies. Here it was washed, mostly without any crushing, and the heavy tin and coltan collected using gravity separation. The concentrate was transported to the Congo river by barges from the site along the Likushi river which was dammed in the middle of the orebody to provide process water for the washing plants. After the soft material was used up, a previous mine operator tried to crush the low grade tin ore and, when this was found to be uneconomic due to increased mining costs, the mine closed.

This simple observation of rock strength to weathering of the pegmatite, and hence the level of surface leaching of the lithium in the spodumene, has been proven by surface sampling and has assisted greatly in the planning for the upcoming JORC compliant exploration program currently underway. Surface sampling and mapping confirm that the harder, unmined areas contain fresher ore grade spodumene. The Roche Dure prospect in the Southern Kitotolo sector was drilled by the Belgian operators of the mine to depths of only up to 40 metres deep into the shallowly dipping pegmatite orebody. Below this the pegmatite was too fresh and hard to supply their mining fleet with the free digging material required. In essence, there was no deep drilling up until 2017, which makes it an incredibly rare beast geologically speaking – a world class undrilled lithium pegmatite orebody which was extensively surface mined without the true value of the ore being recognized.

With continual increases in the demand for lithium products and battery additives in general there is no doubt that Manono will again reassert itself as a dominant mining town in a region well known for its tin and tantalum resources. Local government officials have noted the increased activity and support at all levels, both provincial and federal, has been offered to assist the new exploration activities currently underway. The development of "new" minerals like lithium and cobalt will underpin a new round of investment into the DRC and specifically the Tanganyika province. As the first major lithium project in the DRC, the country will watch with interest to see what the old town can produce in this second mining reincarnation for Manono.

After this tour of the Manono township, the old colonial era tin mine and the excitement of the race to be the first major lithium producer in the DRC, it is hard not to reflect that there is indeed life in the old place after all and a strong and exciting future ahead. •

Ethiopia

Population: 105,350,020
Land area: 1,104,300 sq km
Official language(s): Oromo, Ahmaric, Somali, Tigrigna
Capital: Addis Ababa
Head of Government: Prime Minister HAILEMARIAM Desalegn (since 21 September 2012)
GDP (PPP): $177.4 billion (2016 est.)
GDP growth rate: 8% (2016 est.)
GDP per capita: $1,900 (2016 est.)
Economic Sector Breakdown: agriculture: 37.2%, industry: 21.3%, services: 41.5% (2016 est.)
Exports: $2.814 billion (2016 est.)
Imports: $16.03 billion (2016 est.)
Major Trade Partners: U.S.A., China, Germany, Saudi Arabia

IBRAHIM INDEX OF AFRICAN GOVERNANCE (2017)

SOURCE: MO IBRAHIM FOUNDATION

2016 Rank (Out of 54)	36
2016 Score (Out of 100)	47.7
Safety & Rule of Law	49.0
Sustainable Economic Opportunity	45.0
Participation & Human Rights	40.1
Human Development	56.7

TAXATION RATES

SOURCE: PWC

Corporate Income Tax Rate	35%
Royalties	5-8%

MINING SECTOR CONTRIBUTION TO GDP

SOURCE: AFRICAN ECONOMIC OUTLOOK

2016

5.6%

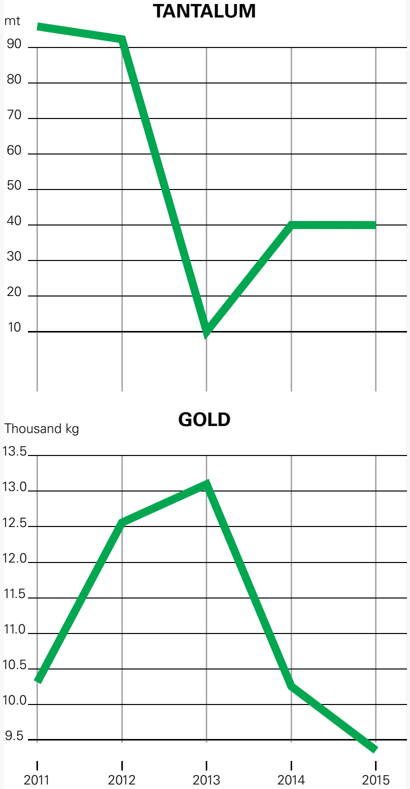
BUSINESS ENVIRONMENT RANKING IN AFRICA (out of 47 sub-Saharan countries)

SOURCE: WORLD BANK

	2015
Ease of Doing Business	31
Starting a Business	39

MINERAL PRODUCTION

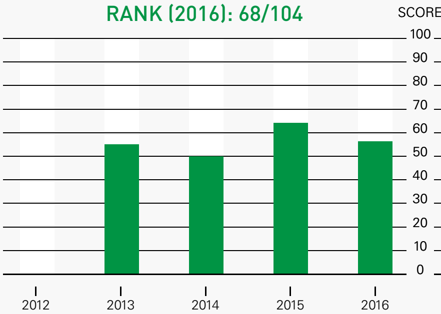
SOURCE: BRITISH GEOLOGICAL SOCIETY



FRASER INSTITUTE INVESTMENT ATTRACTIVENESS INDEX

SOURCE: FRASER INSTITUTE

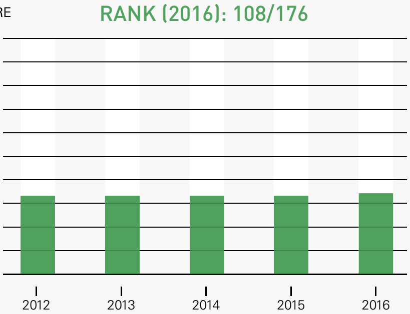
RANK (2016): 68/104



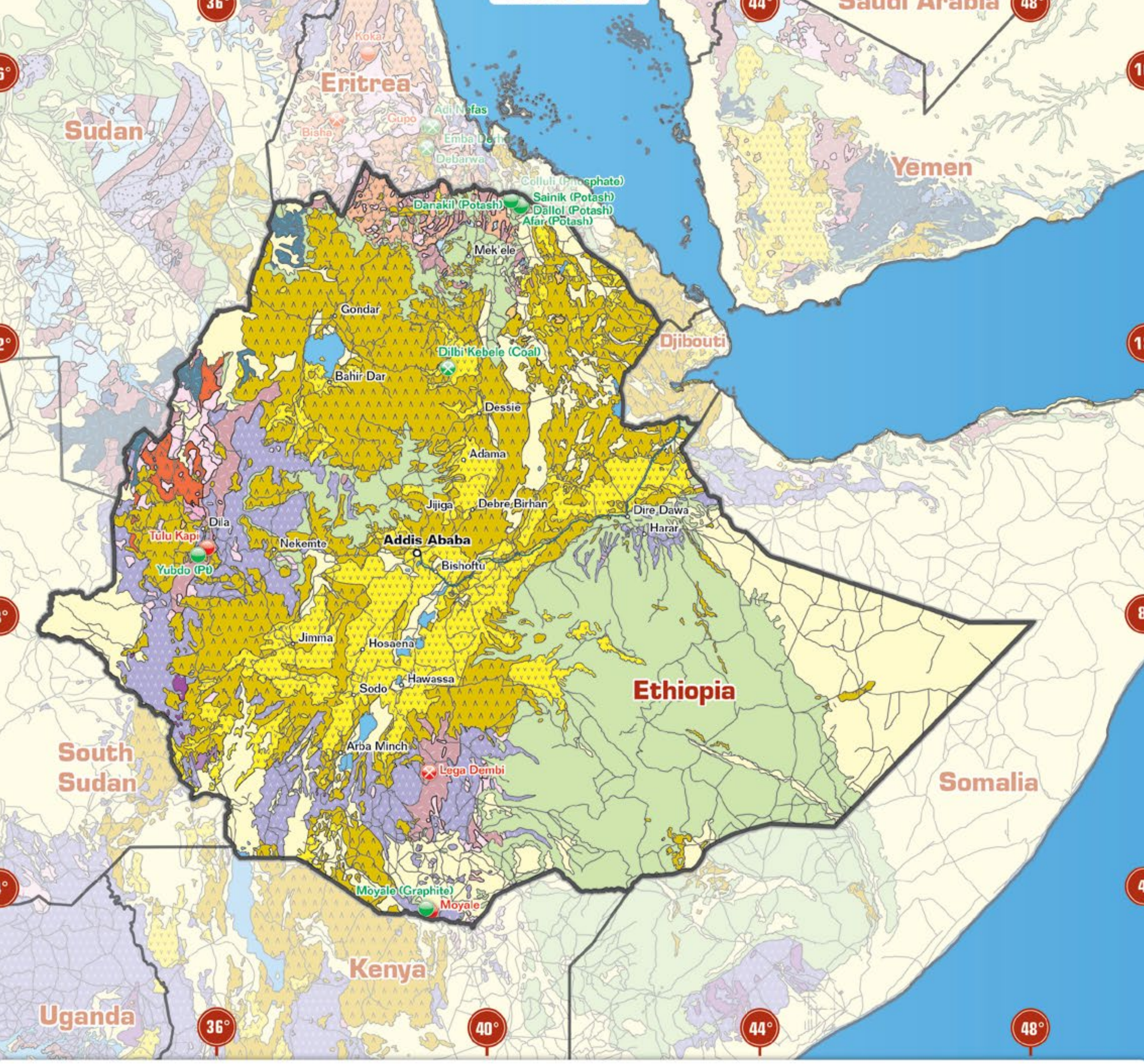
TRANSPARENCY INTERNATIONAL CORRUPTION PERCEPTIONS INDEX

SOURCE: TRANSPARENCY INTERNATIONAL

RANK (2016): 108/176



ETHIOPIA



Your feet on the ground in Africa

NORTH

0 100 200 300

KILOMETERS

GEOLOGICAL DATA: **BRGM - LAT/LONG WGS84**

Mine location data: **www.mining-atlas.com**

Map drafted: **Kwaku Owusu-Ansah**

Graphic design: **Kwaku Owusu-Ansah**

2018 – 1st Edition

www.sems-exploration.com

GOLD MINES
- Existing
- Gold resources
- Closed

OTHER MINERALS
- Existing mines
- Projects
- Closed mines

- Geological boundary certain
- Country Borders
- Roads
- Railway
- Water area

CENOZOIC	MESOZOIC	PALEOZOIC	PROTEROZOIC	ARCHEAN
Sediment	Sediment	Sediment	Sediment	Volcanic felsic
Volcanic felsic	Volcanic felsic	Quartzite	Quartzite	Volcanic mafic
Volcanic mafic	Volcanic mafic	Volcanic felsic	Volcanic felsic	Plutonic felsic
Plutonic felsic	Plutonic felsic	Volcanic mafic	Volcanic mafic	Plutonic mafic
Plutonic mafic	Plutonic mafic	Plutonic felsic	Plutonic felsic	Metamorphic
	Metamorphic	Plutonic mafic	Plutonic mafic	Amphibolite
		Metamorphic	Metamorphic	
			Amphibolite	

SEMS EXPLORATION | THE AFRICAN GEOLOGICAL CONSULTANCY GROUP

Hon. Motuma Mekassa

Minister for Mines, Petroleum and Natural Gas
Ethiopia

Please relate the most important recent developments in the Ethiopian mining sector?

At the moment, the mining industry constitutes only 1.5% of Ethiopia's GDP. However, the government of Ethiopia is very active in the development of the mining sector. We are trying to create a peaceful environment for investors. We recently issued a new mining regulation and we have a good legal framework for operations within the country, which we are constantly improving. The government has also created incentives for supporting infrastructure such as roads, power supply and railways to facilitate investment. In line with this, we created a duty free arrangement for companies coming into Ethiopia that covers machines important to the mining sector.

One of the key focuses for the government is the aggregation of foreign currency reserves and resource development is integral to achieving this. Ethiopia has potash, gold, gemstones, and this is just the cusp it. We are hoping that by 2025, mining will increase its share and achieve 10% of national GDP.

Geological data is essential for attracting more exploration companies into a country and availability of this data remains a big issue in Africa. What geological information is available for companies looking to explore in Ethiopia?

In the mining sector resource identification is very important; in order to attract private companies and investors you have to have the data on hand. We have an agency, the Geological Survey of Ethiopia (GSE), which is responsible for the geological data collection, storing and dissemination. Under our geoscience data collection and mapping mandate we have covered 94% of the country by 1:125,000 scale. In the area of airborne geophysics mapping we have covered about 30% of the country. So there is certainly a need for improvement, but now we are working on building the capacity of GSE to enhance the expertise of our geologists and geophysicists to speed up the acquisition of quality data and extend the scope of this data.

Currently, we are working with different donors on provision of the necessary equipments and training of the experts to scale up the ability of the GSE to avail quality data.

Can you give us an idea of what sort of infrastructure is already in place in terms of electricity, railroads and roads for companies looking to come to Ethiopia?

One of the areas that the government is working on is the infrastructure challenge. We have a different approach to meeting this challenge. We established a committee within the Prime Minister's Office to spearhead the development of support infrastructure. This is an integrated unit that consists of various sectors, mainly the Ministry of Transport, Ministry of Water Resources and Electricity, Railway Authority, and Water Authority to meet the integrated needs of mining operations. These challenges could not be met by one ministry, thus the need for an integrated approach. An example of the strategy in action is the potash mining area in Danakil Depression. We already have a majority of the required road infrastructure under construction. The Water Authority is conducting their study. The Power Authority has allocated a budget and begun work. We agree that infrastructure is important and mining companies have seen the commitment that the Ethiopian government has in facilitating it.

Do you believe international investors have a good understanding of what Ethiopia has to offer?

Awareness is spreading and at a national level the economic situation in the country is improving. With increased economic development, not only mining companies but many private companies are interested in doing business in Ethiopia. We have seen interest from multinationals in our mining and extractive industries that have shown appreciation for the direction the Ethiopian government is taking. As a government we try to create a good operating environment and transact transparently with all the companies coming into the country.

How do you see the future of the mining industry in Ethiopia in the mid-term?

By 2025, we hope to have left the low-income nation table. Mining will have to play a role in that by contributing about 10% to GDP. We have a five-year plan called the Growth and Transformation Plan II (GTP-II). We are in the second year of this plan and under it every sector has a target. The mining sector has ambitious objectives and aims to increase foreign currency revenue by 13% every year. •

Ethiopia

The ancient land of Ethiopia has always jealously guarded its independence, but today is determined to attract investors to explore and exploit the country's minerals.

In 1974, the skeletal remains of Lucy, an Australopithecus that walked the planet 3.2 million years earlier, were discovered in Ethiopia's Afar Triangle. While Lucy became a household name and the region has since been the site of many significant archaeological findings, a few decades would pass until the Danakil Depression, the ground just north of Lucy's discovery site, would garner significant global interest in its contents — large deposits of potash. Indeed, beginning the same year as Lucy's discovery until 1991, foreign investment into the mineral sector of Ethiopia was prohibited and the task of geological discovery was granted exclusively to government insti-tutions, handicapping progress in the country's entire resources sector. However, a profound shift towards focusing on the mining-potential in the soil of the history-drenched Horn of Africa has begun to occur.

As one of the fastest growing economies in the world, demonstrated by a sustained average GDP growth rate over the past decade of 10.2%, Ethiopia has rapidly become a focus for inter-national investment. Given the country's association with severe famine and extreme poverty, this transformation has quickly made it a darling of the developing world and a beacon of suc-cess amongst its East African neighbors that continue to struggle with conflict and economic hardship. However, the catalyst for that growth has largely been driven by the country's ser-vices and agricultural industries, as well as a booming light manufacturing sector. Mining repre-sents an area of untapped potential that could spur that growth further, with mineral exports bringing only around US$231 million in revenue during the previous fiscal year, according to offi-cials at the Ethiopian Ministry of Mines, Petroleum and Natural Gas (MoMPNG). The MoMPNG's ambitious objective to increase the industry's contribution to GDP from 1.5% to 10% signals that there is ample reason for investors to turn their eyes to this nascent mining jurisdiction.

As one would expect of a country steeped in the history of the ancient world, gold was and re-mains the most important mineral mined in Ethiopia. Although mining giant Newmont has greenfield concessions in the Tigray region, the sole large-scale modern mining operation in the coun-try at present is the Lege Dembi mine, which is owned and operated by Saudi Arabian-based company Midroc. Located in the southern greenstone belt region, the mine was acquired after the privatization of the sector in the mid-1990s and has an annual production of 1.6 million tonnes of ore and estimated reserves of 82 million tonnes. However, Ethiopia's gold production could soon be augmented pending the development of several promising exploration projects. At the end of 2017, East Africa Metals (EAM) successfully acquired a mining license for its Terakimti oxide gold project and has two pending applications for the Da Tambuk and Mato Bula gold de-posits. The company's projects along the under-explored Arabian Nubian shield in the northern region of the country represent an investment of around C$30 million dollars over the last six years, resulting in a discovery of approximately 1.8 million gold equivalent ounces. "When you do the math, the discovery cost per ounce is at about C$13 per ounce range, which compares well to the global average of one C$147 per ounce," said Andrew Smith, CEO of EAM. KEFI Minerals' Tulu Kapi gold project boasts about 1 million ounces of resources that the company intends to mine over a 10-year period. The company expects to begin the construction phase in 2018 and see final commissioning by the end of 2019. After agreeing on a US$135 million debt finance package with infrastructure firm Oryx in July 2017, through equity funding KEFI will need to se-cure a further US$24 million of project finance through equity funding.

In terms of potash, several projects have the potential to be game-changers in the global mar-ketplace thanks to the prospectivity of the desert sands of the Danakil Depression in northern Ethiopia — one of the hottest geographic locations on the planet. Yara International's Dallol pro-ject boasts a production capacity of around 600,000 tonnes of sulphur of potash (SOP) per year, which equates to about 10% of the worldwide market. In the beginning of 2017, Circum Minerals was granted a mining license to exploit its Danakil potash project, a deposit with potash-bearing salt beds that could represent a resource as large as 12 to 14 billion tonnes. The company aims to produce 2 million tonnes per annum of muriate of potash (MOP) and 0.75 million tonnes per annum of SOP, which trades at a premium to MOP.

Ethiopia also boasts a range of precious and semi-precious stones, including opals, emeralds, and sapphires. However, the international gemstone market presents unique barriers that will take time to break down given Ethiopia's slight experience in the mining world. MEDA, a Canadi-an non-profit that aids countries in value chain development, nonetheless identified gemstones as an area with strong potential to stimulate several business opportunities and is assisting the government in navigating the opportunities, as well as the challenges, of the sector. "International competition is a fairly large gap we have to overcome," said Thomas McCormack, MEDA Coun-try Representative. "We have to figure out how Ethiopia is going to stack up against gemstones that have been known for their quality and attractiveness for a long time."

For the region to realize its mining potential, several key developments need to take place, all of which with strong and stable governance. In terms of the regulatory framework, this remains a question mark for investors as the notoriously bureaucratic country currently cautiously outlines its policy framework. The country is earnestly evaluating how it will approach its entry into the African mining scene and its relationship with investors, with the objective of developing a frame-work that results in mutually beneficial partnerships. "Ethiopia is a very proud and independent country that likes to have control over its own situation," elaborated Smith, CEO of EAM. "They recognize the extreme value their mineral sector can have for the local population by fighting poverty and developing regional economies."

The experiences navigating the regulatory requirements of early arrivals from abroad such as Vancouver-based EAM or London-listed KEFI are helping to set a precedent for companies to come. "We are actually doing quite a bit of capacity building within the government by pushing the Tulu Kapi project forward. Overall, the country wants this development and is ready for it, but there must be improvements to capacity in order for them to deliver. For example, the permitting department is not used to working at the pace of Western companies or issues around financing regarding the time-value of money. The documents and procedures set in place for us required a lot of work and negotiations, but the outcome has created templates for other projects," said Wayne Nicoletto, managing director of Tulu Kapi Gold Mines Share Company, the wholly-owned subsidiary of KEFI in Ethiopia.

The streamlining of geographical data through the Geological Survey of Ethiopia is one initiative that will aid in promoting the mineral sector in front of investors through the development of a ge-ospatial database management system to collect, analyze, manage and disseminate geoscience information. "The consolidation of information, related to geology and the mineral potential of Ethi-opia, is also available but has not yet been translated into concrete, user-friendly tools and ser-vices. It is therefore difficult for investors to see the country's full potential," explained Isabeau Vilandre, director of the SUMM project, which functions as a support arm for the Ethiopian gov-ernment as it seeks to introduce systematic reforms to the industry through the Canadian devel-opment initiative CIRDI.

In addition to defining a business environment that will meet the needs of both investors and Ethi-opia's development goals, continued political stability will be a crucial ingredient for the successful launch of the country's mining sector into the international scene. Despite its rising-star reputa-tion, investors remain queasy about the risks of venturing into a new mining jurisdiction. Periodic reports of violence stemming from the nation's southern Oromia province due to longstanding ethnic feuds continue to give cause for questioning the country's stability, and a legacy of battling extreme impoverishment will undoubtedly produce lingering struggles. Nonetheless, Ethiopia has been posting consistently positive development figures that suggest wary investors should re-consider this jurisdiction. If government and the private sector can establish a strong partnership based on trust and equality, Ethiopia's already booming economy will only strengthen from the added dynamism of the mining sector. •

Tanzania

Population: 53,950,935
Land Area: 947,300 sq km
Official Language(s): Swahili
Capital: Dar es Salaam
Head of Government: President John MAGUFULI, Dr. (since 5 November 2015)
GDP (PPP): $150.3 billion (2016 est.)
Growth Rate: 7% (2016 est.)
GDP per Capita: $3,100 (2016 est.)
Economic Sector Breakdown: agriculture: 24.5%, industry: 27.6%, services: 47.3% (2016 est.)
Exports: $5.697 billion (2016 est.)
Imports: $8.464 billion (2016 est.)
Major Trade Partners: China, India, South Africa, Switzerland

IBRAHIM INDEX OF AFRICAN GOVERNANCE (2017)

SOURCE: MO IBRAHIM FOUNDATION

2016 Rank (Out of 54)
17

2016 Score (Out of 100)
57.5

Safety & Rule of Law
62.9

Sustainable Economic Opportunity
49.5

Participation & Human Rights
61.5

Human Development
56.1

TAXATION RATES

SOURCE: PWC

Corporate Income Tax Rate
30%

Royalties
6%

MINING SECTOR CONTRIBUTION TO GDP

SOURCE: AFRICAN ECONOMIC OUTLOOK

2015
3.7%

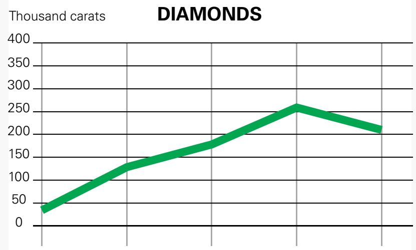
BUSINESS ENVIRONMENT RANKING IN AFRICA (out of 47 sub-Saharan countries)

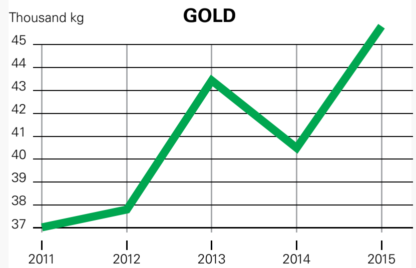
SOURCE: WORLD BANK

	2015
Ease of Doing Business	15
Starting a Business	34

MINERAL PRODUCTION

SOURCE: BRITISH GEOLOGICAL SOCIETY

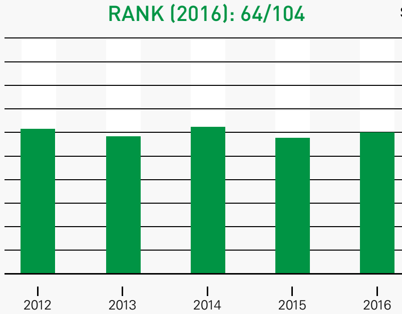




FRASER INSTITUTE INVESTMENT ATTRACTIVENESS INDEX

SOURCE: FRASER INSTITUTE

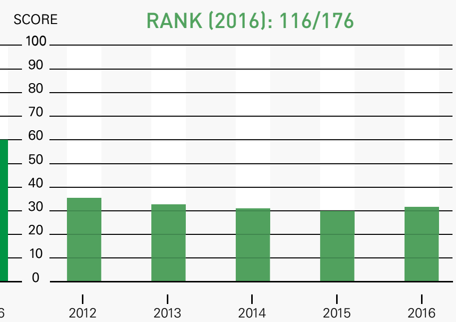
RANK (2016): 64/104



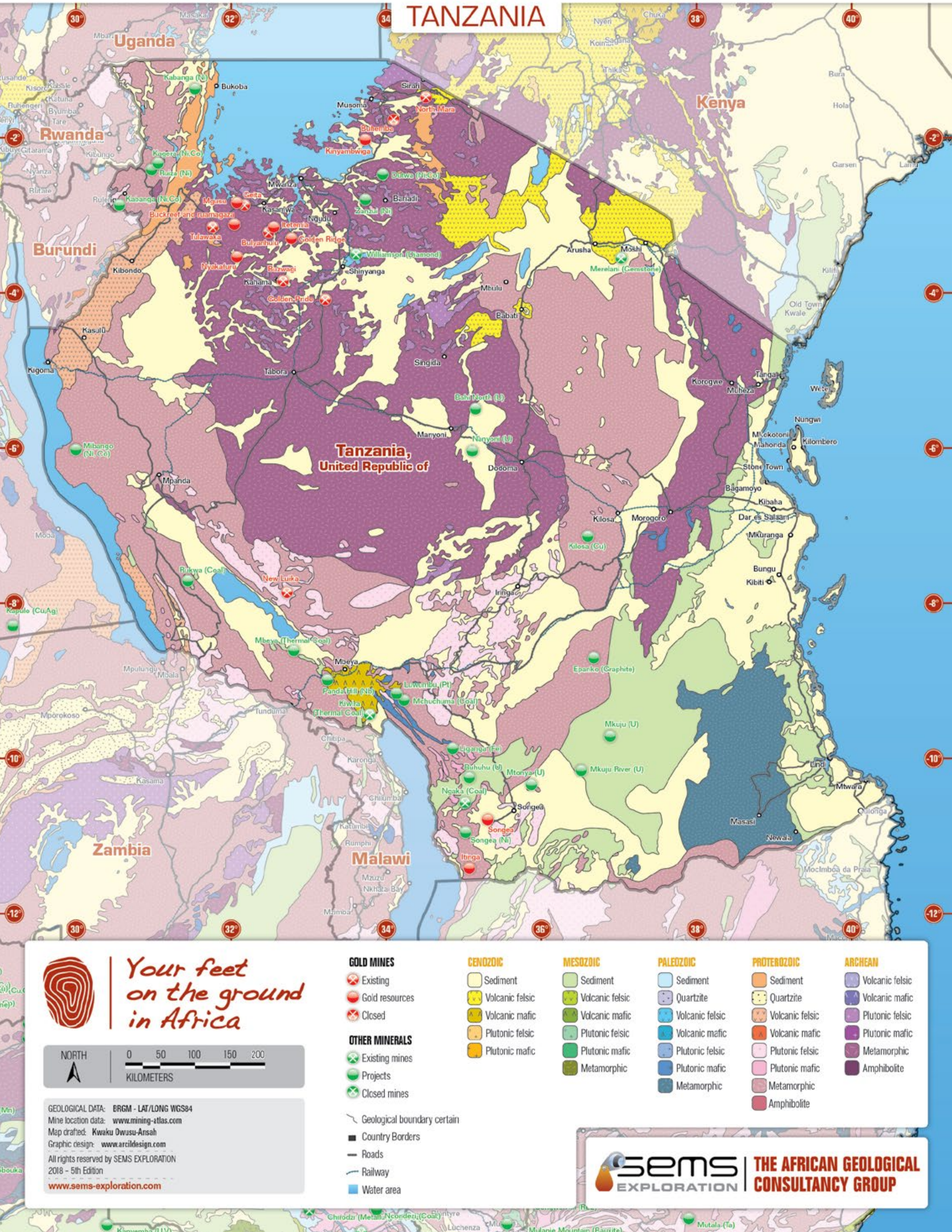
TRANSPARENCY INTERNATIONAL CORRUPTION PERCEPTIONS INDEX

SOURCE: TRANSPARENCY INTERNATIONAL

RANK (2016): 116/176



TANZANIA



Uganda
Kenya
Rwanda
Burundi
Zambia
Malawi
Tanzania,
United Republic of
Bukoba
Kabanga (Ni)
Sirari
Musoma
North Mara
Bulhembe
Kinyambwiga
Kagera (Ni,Co)
Ruaza (Ni)
Dutwa (Ni,Co)
Mwanza
Kabanga (Ni,Co)
Mgusu
Geita
Kasamwa
Bariadi
Zanzui (Ni)
Buckreef and Ruamsagaza
Ngudu
Iketemia
Tulawaka
Bulyanhulu
Golden Ridge
Williamson (Diamond)
Nyakafuru
Bazwagi
Shinyanga
Kahama
Golden Pride
Kibondo
Arusha
Moshi
Merelani (Gemstone)
Mbulu
Babati
Kasulu
Kigoma
Tabora
Singida
Korogwe
Tanga
Muheza
Bahi North (U)
Manyoni
Nanyoni (U)
Mibango (Ni,Co)
Dodoma
Mpanda
Kilosa
Morogoro
Bagamoyo
Kibaha
Dar es Salaam
Mkuranga
Kilosa (Cu)
Bungu
Kibiti
Rukwa (Coal)
New Luika
Iringa
Kapulo (Cu,Ag)
Mbeya (Thermal Coal)
Mbeya
Epanko (Graphite)
Panda Hill (Nb)
Lumumbu (Pt)
Mchuchuma (Coal)
Kiwira (Thermal Coal)
Mkuju (U)
Liganga (Fe)
Ruhuhu (U)
Mtonya (U)
Mkuju River (U)
Ngaka (Coal)
Songea
Songea (Ni)
Itiriga
Lindi
Mtwara
Masasi
Newala
Mpulungu
Mbala
Tunduma
Mporokoso
Chitipa
Karonga
Kasama
Chilumba
Katumbi
Rumphi
Mzuzu
Nkhata Bay
Mzimba
Moba
Kisoro
Kabale
Katuna
Ruhengeri
Byumba
Tare
Kibungo
Gitarama
Nyanza
Butare
Rujenge
Nyeri
Koimbi
Sagana
Chuka
Thika
Bura
Hola
Garsen
Lamu
Kilifi
Old Town
Kwale
Wete
Nungwi
Mkokotoni
Mahonda
Kilombero
Stone Town
Mocimboa da Praia
Quionga
30°
32°
34°
36°
38°
40°
-2°
-4°
-6°
-8°
-10°
-12°
Your feet on the ground in Africa
NORTH
0 50 100 150 200
KILOMETERS
GEOLOGICAL DATA: BRGM - LAT/LONG WGS84
Mine location data: www.mining-atlas.com
Map drafted: Kwaku Owusu-Ansah
Graphic design: www.arcildesign.com
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2018 – 5th Edition
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GOLD MINES
Existing
Gold resources
Closed
OTHER MINERALS
Existing mines
Projects
Closed mines
Geological boundary certain
Country Borders
Roads
Railway
Water area
CENOZOIC
Sediment
Volcanic felsic
Volcanic mafic
Plutonic felsic
Plutonic mafic
MESOZOIC
Sediment
Volcanic felsic
Volcanic mafic
Plutonic felsic
Plutonic mafic
Metamorphic
PALEOZOIC
Sediment
Quartzite
Volcanic felsic
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PROTEROZOIC
Sediment
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Plutonic mafic
Metamorphic
Amphibolite
ARCHEAN
Volcanic felsic
Volcanic mafic
Plutonic felsic
Plutonic mafic
Metamorphic
Amphibolite
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Tanzania

The Pan-African and perennial issue of resource nationalism is being played out in Tanzania where the government seeks to readdress its relationship with mining companies.

Tanzania is undoubtedly a controversial country to highlight as a destination for mining investment in the current context. Not withstanding the number of exciting projects it holds, this well-established mining destination remains a critical focus because of, not despite, the ongoing dispute between the government and Barrick Gold-backed Acacia Mining, that has been at the forefront of news in the African mining community for over a year. The case in Tanzania provides a magnified example of the same debate occurring in several African countries — even if other rumblings are less apparent to the outside observer. "It has been a contentious time between governments and the mining companies, and also the NGOs that lobby on behalf of tax collection for African countries," elaborated Douglas Ironside, managing partner of BDO Zambia, a country where similarly tense discussions are taking place amongst stakeholders.

The investment community was left reeling when, in March 2017, the Tanzanian authorities enacted a surprise ban on the export of unprocessed gold and copper concentrates. The ban was directed at penalizing large producers, namely Acacia, whose Bulyanhulu and Buzwagi mines are the nation's largest gold producing operations. The ban came about when the government accused Acacia of under-reporting its exports, a claim which the company firmly denies. Tanzania President John Magufuli, who has gained the nickname The Bulldozer for his reputation in pushing through projects, initiated a crackdown on government corruption that led to the firing of the nation's mining minister and chief of the state-run mineral audit agency, Sospeter Muhongo. Following the results of an investigation into the value of minerals within concentrates in containers at the country's Dar es Salaam port, the probe alleges the minister colluded with mining companies to evade taxation.

In the fallout of this series of investigations and attempted arbitrations, Acacia was hit with a US$190 billion bill of combined interests, fines and what the government believes it is owed in unpaid taxes. In October 2017, a deal was proposed to end the ban under conditions including a US$300 million payment from Acacia and an arrangement whereby going forward 50% of the profit generated by the company's activities will be shared with the Tanzania government in the form of royalties, taxes and a 16% free carried interest in the company's in-country mining assets. The affair saw two of Acacia's top mining executives step down and the company lost US$1.7 billion of its market value. The situation remains fluid, but if the deal holds in 2018, an uneasy peace may have been reestablished and we will begin to understand the new norm in Tanzania.

Image courtesy of Advent Constructions

Although gold has been a less appetizing investment in the region following the above-mentioned events, the resource-wealthy nation holds many other projects that have seen movement despite the unfavorable circumstances. Many smaller players were directly impacted as uncertainty about the direction of future regulations created cause for hesitation in foreign investment. Campbell Baird, managing director of Indiana Resources, related that despite the fact that the company's exploration activities are in nickel: "News of the ban has generated a dramatic ripple effect that all of us have felt in terms of reducing interest in investment and making current investors skittish," he said.

A few months passing with no further bad news seems to have calmed the nerves of investors a bit, evidenced by Volt Resources' successful raising of US$4.7 million in January 2018, that will assist the company in funding Stage 1 of its flagship Bunyu project, which represents the largest defined graphite resource in Tanzania.

The global buzz around the advent of the lithium ion battery has spurred particular interest in Tanzania's high-grade graphite potential. Paradoxically to its name, the battery contains about seven to 10 times more graphite than lithium to produce the anodes and Tanzanian graphite fields tend to occur in the required flake format. Trevor Matthews, CEO of Volt, elaborated: "A change in a governance position or legislation that imposes bans, increases taxes, or changes ownership structures can be significant in terms of holding up investment. However, we do not believe that our project is being held up any more than our other graphite projects around the world." With the addition a US$40 million Tanzanian bond issue financing with Exotix Capital, the company's financial situation will allow it to achieve several operational milestones throughout 2018, including the completion of a feasibility study and the production of a bulk graphite product that will satisfy existing off-take agreements.

Magnis Resources' Nachu and Kibaran Resources' Epanko projects have also continued to attract substantial investment interest from around the globe, including finance from both Russian and German institutions. Walkabout Resources' Lindi Jumbo graphite project is awaiting approval for a mining license, and the company intends to exercise an option to acquire the remaining 30%. "The initial plan is to produce 40,000 tonnes per year, which makes it a very manageable mine," said Allan Mulligan, the company's executive director. "The high grade also allows for a much reduced capital and complex size. Although we are producing 40,000 mt/y of graphite concentrate, we are only mining 280,000 mt/y of ore. That is a very small mine for an open cut, so it is a very achievable operation requiring low capital."

However, the quantities of graphite that will be required to satisfy the needs of its various markets are uncertain, and securing off-take agreements therefore remains a priority for companies hoping to take advantage of the metal's attractive positioning in global markets.

These promising developments in the graphite sector suggest that Tanzania's future as a leading African mining destination may yet persist despite a tumultuous

> *The flake graphite market is finite in size currently, and although it is forecasted to grow substantially, there is every possibility that there will be an oversupply of product.*
>
> *- Allan Mulligan,*
> *Executive Director,*
> *Walkabout Resources*

year. As the government's restructuring of its relationship with the mining community continues to play out throughout 2018, Tanzania's fate will likely set an important precedent. This tendency towards resource nationalism is perennial, but this particular scenario has brought the conversation to a very public head. How the situation in Tanzania ultimately resolves will likely represent a watershed in the African mining industry that will influence the direction of the relationship between international mining companies and governments across the continent. As such, any foreign investor that wants to understand the mineral potential of African nations and the future of projects in the continent should look closely at Tanzania to gain a better understanding of the complexities and political risks of operating in developing regions. •

WEST AFRICA

GUINEA - COTE D'IVOIRE - MALI - SENEGAL

"Our investment in Africa and specifically West Africa is solid and we see our profits from that region continuing to be healthy. We see longevity at all our mines in the region, partly because of our investment but also because we have strong relationships with our stakeholders in the region."

- Sven Lunsche, VP Corporate Affairs — Gold Fields

Image courtesy of Endeavour Mining

West Africa

Home to some of the fastest growing economies of the world.

West Africa has been at the heart of the African transformation. Over the past decade, this region has achieved remarkable economic growth, outperforming other regions in the continent and emerging as the darling for investors worldwide. Although growth has gradually slowed, West Africa houses some of the continent's stellar economic performers, namely Ivory Coast, Senegal and Burkina Faso, while being home to Afri-ca's largest economy and most populous country, Nigeria. Sound macroeconomic pol-icies, ameliorating political conditions, and major infrastructure developments have contributed to noteworthy investments in the mining sector of West Africa. From Gha-na's world-renowned gold deposits to Burkina Faso's unexplored wealth, West Africa will certainly host some of the most attractive projects for the industry across the conti-nent.

Image courtesy of SMT

Burkina Faso is experiencing a boom in its mining industry. Land-locked but endowed with immense mineral wealth, this country has quietly emerged as one of the preferred destinations for mining investors. Although falling behind gold-producing giants like South Africa, Ghana and Mali, Burkina Faso has the highest number of new gold pro-jects in the continent, and the export accounts for nearly 80% of its income. In early 2017, Endeavour Mining confirmed it had added over 260,000 oz. to the proved re-source at its Karma gold mine, thereby extending its mine life to more than 10 years. Moreover, the company commenced production ahead of schedule at its Houndé pro-ject which expects average annual production of 190 000 oz over an initial 10-year mine life and will employ around 470 people, of which 90% will be Burkinabe nation-als. These developments are welcome in a largely undeveloped and poor country.

Meanwhile, major gold producer IAMGOLD has announced the installation of a 15-megawatt solar power plant at its Essakane mine, which will become one of the largest hybrid diesel solar photovoltaic projects in the world. TSX-listed Roxgold also experi-enced success in the Houndé greenstone region, announcing that it had been granted permitting approval to develop its Bagassi South project, located within its high-grade Yaramoko gold mine. The upcoming years look very promising for Burkina Faso, with companies like Centamin, Orezone, and Semafo also heavily invested in the country and eyeing near-term development or production.

With an estimated 822 tons of gold reserves, Mali remains a hotspot for gold mining companies worldwide. Largely due to developments from Randgold's Loulo-Gounkoto complex and the Morila mine, the country has managed to increase its reserves signif-icantly in the past few years. Although the security situation in the north of the country has overshadowed developments in the industry, Mali's mining sector has ultimately experienced a very eventful year highlighted in the upcoming pages of this report.

Well-established mining jurisdictions such as Ghana have upgraded efforts to reap the benefits of increased investment flows to the region. The new administration of Presi-dent Nana Akufo-Addo has reiterated its commitment to boost the sector following a largely stagnant environment over the past four years by tackling illegal mining and streamlining permitting processes. Speaking about investment opportunities in West Africa, Michael White, president and CEO at IBK Capital, a Toronto-based firm, said: "IBK has always enjoyed Ghana as a mining jurisdiction since the country is deeply rooted in the rule of law and has been fairly stable for decades. Additionally, substan-tial infrastructure has been built up in Ghana over the past 20 years, evidencing the country's rapid evolution. It is great to see that the government is creating access for these projects and investing in the mining sector in general."

While Ghana remains a strong favorite of investors, Senegal, Guinea, and Ivory Coast are the newest players to create considerable hype in an already-buzzing West Africa. White added: "Guinea is also a country in which we have been comfortable investing, as it has a long history of uninterrupted bauxite supply through an established rail line and port system."

In Senegal, several explorers and developers such as Bassari Resources are gearing up to begin production. The ASX-listed gold developer is slated to begin awarding contracts for its Makabiungui gold project with the objective of delivering its first high grade ore to the processors by mid-2018. Senegal expects to produce between 205,000 and 225,000 ounces of gold in 2017, and phosphate production for the year could be as high as 2,000,000 tonnes.

Notwithstanding these positive developments across the region, Ivory Coast is one of Africa's fastest growing economies with a growth rate of roughly 8% in 2016, and thus remains a focal point of international interest amongst the mining community. Endeav-our completed a transaction to sell its Nzema mine in Ghana in December 2017 just as it announced plans to ramp up work on the Ity mine in Cote d'Ivoire, and IronRidge Resources has seen similar opportunity to expand into the nascent jurisdiction. "We already had the Cape Coast lithium project with Egyasimanku Lithium Resource in Ghana, which was developing quite nicely and moved into Cote d'Ivoire as part of our lithium growth strategy, said Vincent Mascolo, managing director and CEO at IronRidge. "We saw oppor-tunities in Cote d'Ivoire and within weeks moved in; it was easy to establish ourselves."

Of course the plethora of exciting developments across the West African mining indus-try are not without their challenges, and the region only takes in 5% of FDI geared to-wards the African continent. Obstacles like access to power and lack of reliable trans-portation continue to hold the region back from reaching the full potential of its vast mineral wealth. In the following pages of this report, we endeavor to provide updates from the field regarding both the positive developments and what still needs work in some of the region's most compelling and complex destinations for investment in 2018. •

Guinea

Population: 12,413,867 (July 2017 est.)
Land Area: 245,857 sq km
Official Language(s): French
Capital: Conakry
Head of Government: Prime Minister Mamady YOULA (since 26 December 2015)
GDP (PPP): $24.38 billion (2016 est.)
Growth Rate: 6.6% (2016 est.)
GDP per Capita: $1,900 (2016 est.)
Economic Sector Breakdown: agriculture: 19.9%, industry: 37.6%, services: 42.5% (2016 est.)
Exports: $1.954 billion (2016 est.)
Imports: $2.109 billion (2016 est.)
Major Trade Partners: China, Ghana, Netherlands, India

TAXATION RATES

SOURCE: PWC

Corporate Income Tax Rate

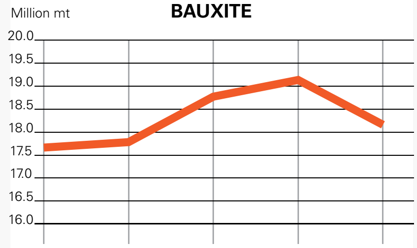
35%

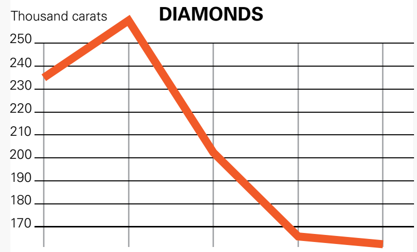
Royalties

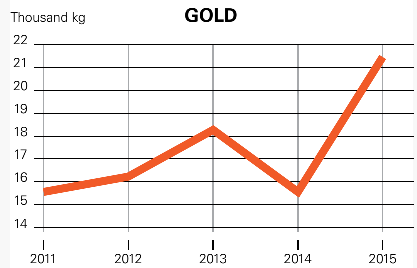
-

MINERAL PRODUCTION

SOURCE: BRITISH GEOLOGICAL SOCIETY







IBRAHIM INDEX OF AFRICAN GOVERNANCE (2017)

SOURCE: MO IBRAHIM FOUNDATION

2016 Rank (Out of 54)

39

2016 Score (Out of 100)

45.5

Safety & Rule of Law

51.0

Sustainable Economic Opportunity

37.0

Participation & Human Rights

47.9

Human Development

45.9

MINING SECTOR CONTRIBUTION TO GDP

SOURCE: AFRICAN ECONOMIC OUTLOOK

2016

2.8%

BUSINESS ENVIRONMENT RANKING IN AFRICA (out of 47 sub-Saharan countries)

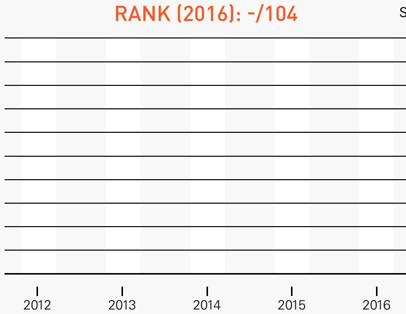
SOURCE: WORLD BANK

	2015
Ease of Doing Business	26
Starting a Business	22

FRASER INSTITUTE INVESTMENT ATTRACTIVENESS INDEX

SOURCE: FRASER INSTITUTE

RANK (2016): -/104



TRANSPARENCY INTERNATIONAL CORRUPTION PERCEPTIONS INDEX

SOURCE: TRANSPARENCY INTERNATIONAL

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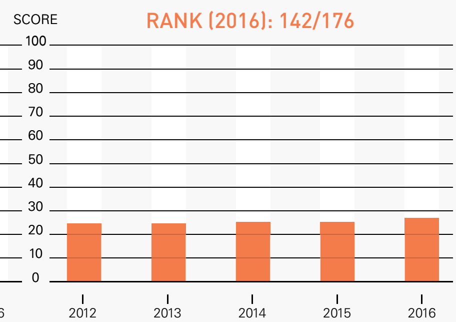

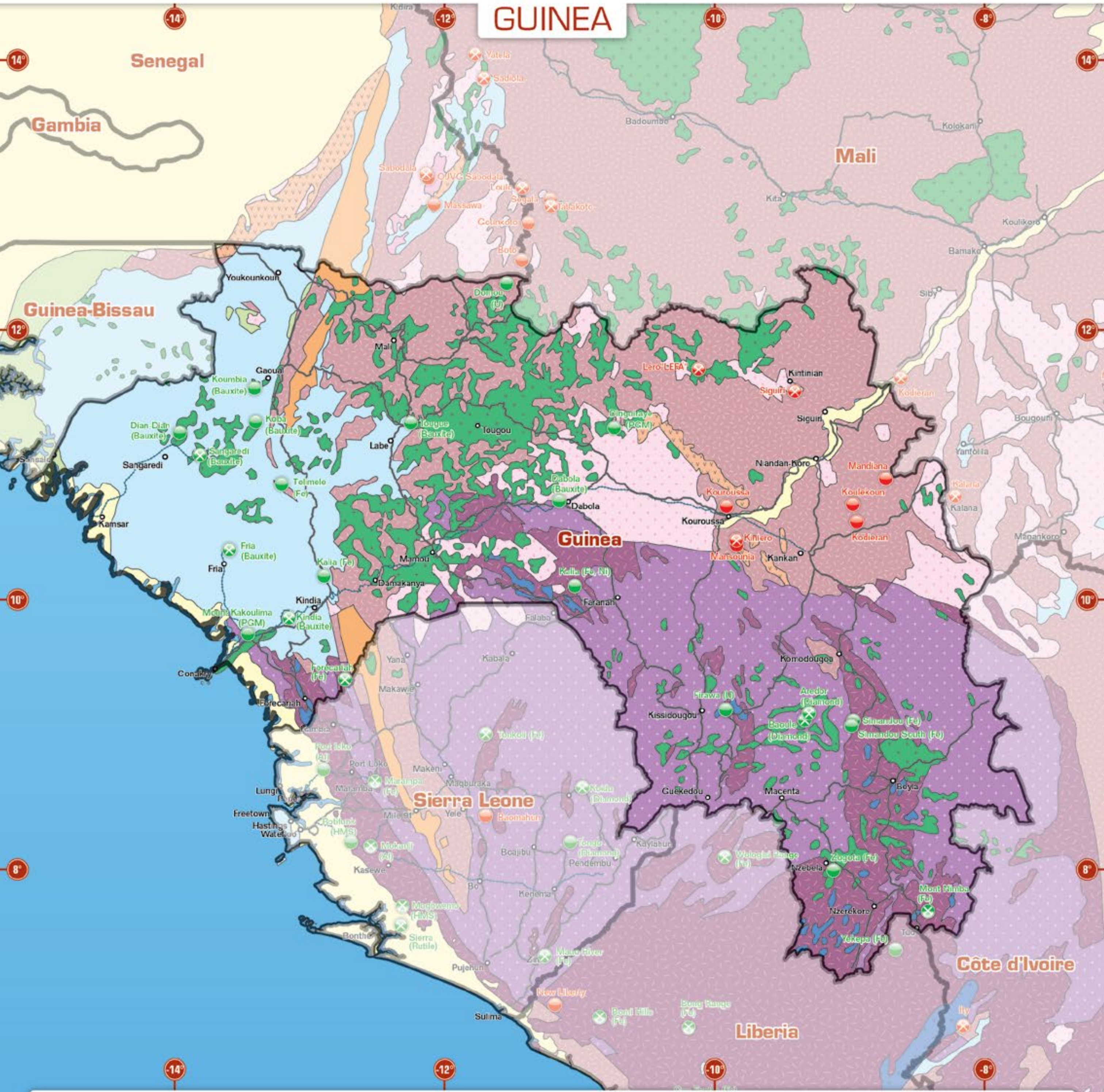

GOLD MINES
- Existing
- Gold resources
- Closed

OTHER MINERALS
- Existing mines
- Projects
- Closed mines

CENOZOIC	MESOZOIC	PALEOZOIC	PROTEROZOIC	ARCHEAN
Sediment	Sediment	Sediment	Sediment	Volcanic felsic
Volcanic felsic	Volcanic felsic	Quartzite	Quartzite	Volcanic mafic
Volcanic mafic	Volcanic mafic	Volcanic felsic	Volcanic felsic	Plutonic felsic
Plutonic felsic	Plutonic felsic	Volcanic mafic	Volcanic mafic	Plutonic mafic
Plutonic mafic	Plutonic mafic	Plutonic felsic	Plutonic felsic	Metamorphic
	Metamorphic	Plutonic mafic	Plutonic mafic	Amphibolite
		Metamorphic	Metamorphic	
			Amphibolite	

- Geological boundary certain
- Country Borders
- Water area
- Roads
- Railway

Your feet on the ground in Africa

NORTH

0 50 100 150

KILOMETERS

GEOLOGICAL DATA FROM BRGM - LAT/LONG WGS84

Map crafted by Stanislas de Stabenrath & David Byrne - Contributions by Kwaku Owusu Ansah -

2018 - 3rd edition - info@sems-exploration.com

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THE AFRICAN GEOLOGICAL CONSULTANCY GROUP

Hon. Abdoulaye Magassouba

Minister
Guinea Ministry of Mines and Geology

What are the Ministry's near-term priorities for the mining sector looking forward into 2018?
Our ultimate goal is to best position Guinea on the international mining market and diversify our production. Since 2011, we have been working to implement profound reforms in the sector in order to create a friendlier business environment. As a result, we completely reviewed our legal framework, strengthened our institutional capacity, including the Ministry, and improved governance as a whole. Furthermore, we became compliant to the Extractive Industries Transparency Initiative in 2014, and Guinea has acceded to the International Certification System of the Kimberley Process since 2003. Additionally Guinea publishes all its mining conventions and agreements online, a handbook of procedures for the management of titles is also available, procedures for granting authorizations and titles have been streamlined through a single one-stop-shop. Other major reforms we are carrying out are the rationalization of artisanal mining, the development of local content and the pursuit of geological research. Looking forward, our prospect for the development of Guinea's mining industry is to not only increase our market share on bauxite, but to process it locally and get to a point where we have a meaningful share of the aluminum market. Our second goal is diversification. We want investors to invest in gold mining, diamonds and other minerals.

What is the ministry doing to improve the business environment for private investors and what updates in the mining code make Guinea a more attractive destination?
There is still a gap that we are trying to narrow down between the facts and perception of the business environment in Guinea. When talking about the facts, we have come very far because it was previously impossible to imagine that Guinea could publish all its mining contracts online, but we now have accomplished that. Our previous mining code was adopted in 1995 and was very outdated. Thus we adopted a new mining code in 2011, and amended it 2013 to align it with current best practice in the industry. In the new mining code, we emphasized governance issues such as transparency, coupled with provisions against corruption and environmental issues for a more durable, sustainable management of the extractive sector. Also, the tax package was discussed with all stakeholders including international financial and technical partners, such as the INF, to ensure we are not putting too much weight on mining companies. The government is also encouraging local processing though tax incentives for mining companies that are willing to make this effort.

What is the Ministry's strategy to mitigate tensions between mining companies and the communities in which they operate?
In regions where we used to have perhaps only one or two mining companies, we suddenly have five or more, and this development has created a significant migration from neighboring countries, which in turn greatly increases the demand for public infrastructure because of the influx of people. In 2016 alone, the demand for electricity doubled in the region of Boké. To prevent and mitigate tensions between different stakeholders, the government is developing coherent policies such as the adoption of a CSR and local content policy for the mining sector with the support of the World Bank. Our objective is to have a clear set of policies that will help us improve the positive impact of mining companies in the region and lay out their responsibilities towards the communities where they operate. We are also working to identify critical infrastructure challenges in these areas. In terms of electricity, we have assessed the situation and we are working on short-term, medium-term and long-term solutions.

What initiatives does the ministry have in place to support the development of the mining sector in terms of local beneficiation?
One critical initiative we are working on is to address the problem of information flow. Local companies, for many different reasons, do not have access to the information they need for their involvement in the bidding process in order to gain access to the contracts. We are building a platform where mining companies can post their projects online so the local companies that are participating in the system will have access to these opportunities in a timely, transparent and equitable manner. This would provide a formal link between the mining companies and the local companies, which we hope will present a resolution to the information flow problem. •

Guinea

'A geological scandal' – Guinea's vast natural resources are underdeveloped, as is the infrastructure.

Speaking about the rapid developments throughout the West African region in recent years, a local businessman in Mali dismissed his country's neighbor on the coast, scoffing: "Guinea just woke up." And indeed, despite holding around 40% of the globe's proven bauxite reserves and the world's largest deposit of iron ore, a reputation for a challenging business environment, poor infrastructure, and adverse global market conditions have prevented Guinea's mining sector from recognizing its full potential. The devastating impact of ebola and extreme poverty further impede the country's ability to propel its economy forward. In recent years, however, the Ministry of Mines has lead an invigorated campaign to modernize the regulatory framework and introduce new tools to entice investors. In conjunction with huge injections of capital to develop critical infrastructure projects and recovering commodity prices, it may finally be Guinea's time to join the ranks of West Africa's leading mining jurisdictions.

"To paraphrase our former President, the Hon. Ahmed Sekou Touré, Guinea is a geological scandal. Opportunities are huge and the current government is pushing for the development of the mining sector. We have plenty of resources in Guinea and the quality of our minerals, obviously bauxite but also iron ore, is internationally renowned," said Thierno Mamadou Baïlo Diallo, managing director of local insurance firm SOGAM.

The Simandou deposit, originally discovered by Rio Tinto in 1997, has the potential to be one of the world's richest iron ore deposits with reserves estimated to be over 2 billion tonnes. However, several years on and Simandou has remained untapped despite billions of dollars of investment amid a cloud of political scandal and corruption. Rio Tinto will dispose of its stake in Simandou through a transaction with Chinalco, but despite its troubled past, the project remains a testament to Guinea's iron ore potential. Furthermore, the range of geological wealth to be found in the country is vast. Guinea produces approximately 8-10 tonnes of gold annually and contains estimated reserves of 700 tonnes, predominantly in the northeast of the country where it shares the same gold-rich Birimian greenstone belt found in Mali, Ghana, and Burkina Faso. Societe Ashanti de Guinee (SAG) and Societe Miniere de Dinguiraye (SMD) are the two international producers that can be found in the country, operating the Siguiri and Lefa mines, respectively. Diamonds also represent an opportunity in the Banankoro-Sefadou area of the country, however, bauxite undoubtedly represents the country's most significant asset.

Like iron ore and copper, aluminum demand is strongly linked to economic development, but rather than industrial activities like infrastructure and construction developments, aluminum is related more to increased activities in the production of consumer goods. Therefore, trends in demand will be largely driven by growth in emerging economies like China and India as their middle classes continue to emerge and mature. However, as Bernie Pryor, CEO of Alufer points out: "You cannot look at bauxite through a pure supply and demand lens like copper, zinc, nickel or even iron ore. The supply-demand curve is highly influenced by the quality of bauxite," he said. "If you produce a good quality product, you will be able to sell it at a premium, but if it is low quality, this is more of a challenge. That is a key distinction to make."

Alufer expects to ship first ore from its Bel Air project in Q3 2018, and will then ramp up to initial production of 5.5 million mt/y.

Guinea's high quality reserves are well-suited to meet global market needs, and while it has the potential to supply more than its current contribution of 10% of world bauxite production, the country has been an established supplier for more than 40 years thanks to the activities of Cie des Bauxites de Guinée's (CBG). CBG has been operating in Guinea since the 1970s and is the single largest producer of bauxite in the world. Another significant player is SMB, which produces

Guinea:

TELIMELE BAUXITE PROJECT

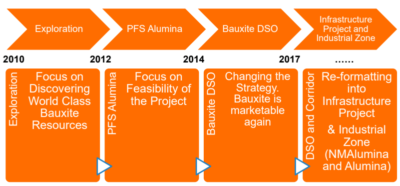
EURASIAN RESOURCES

Match in Time, Size, and Place

- Goal to ship high quality bauxite from West Africa to China and Middle East in Q2 2018
- One of the biggest mineral properties in Guinea – 5 billion tonnes of JORC resource
- Plan to build low cost dedicated infrastructure to load Cape Size parcels at 10 MTPA and more to go East

Project Overview

- Telimele Exploration License is owned by Eurasian Resources SARL, incorporated in Guinea in 2010, the 100% subsidiary of ELOFT Group, who operates the project
- The Status of the License:
  - 2010: Exploration Permit- 2,003 km²
  - 2017: Mining License was Granted in Dec 2017. Total Site Area - 697.63 km²



Key Milestones and Permits

- Eurasian Resources has executed the memorandum of understanding with several owners along the transportation route, granting Eurasian Resources with an exclusive rights to develop and operate deposits within the transport corridor of Telimele deposit
- Eurasian Resources was granted the right to lease land in the Kokaya area for a period of 60 years
- Eurasian Resources obtained Permissions on Port and Dirt Road Constructions.
- Eurasian Resources is the owner of exclusive information on the water corridor and the only company that has completed a full cycle of bathymetric and geophysical studies in the Rio Pongo River area with access to the open ocean
- Eurasian Resources carried out a full cycle of environmental and sociological studies of the project's impact zones
- Preparation to Construction Phase in Port Zone is started since December 2017

JORC Resource

- **130,000 m**/10,000 drill holes **exploration** was completed by Geoprospects under supervision of SRK Consulting
- Mineral composition: **gibbsite (60.89%)**, goethite (19.66%), hematite (9.20%), quartz (0.82%), anatase (0.57%), with 3.20% amorphous material
- JORC mineral resource has been signed off by CSA Global in 2016
- The ore is amenable to **low temperature Bayer process**

JORC Mineral ResourceS BY CSA GLOBAL, 2016

Resources	35% Al_2O_3 cut-off			40% Al_2O_3 cut-off		
	'000,000 t	Al2O3 (%)	SiO2 (%)	'000,000 t	Al2O3 (%)	SiO2 (%)
Measured	1,781	40.53	2.16	839	43.7	2.15
Indicated	2,259	40.44	2.05	1,019	43.7	1.98
Sub-Total	**4,040**	**40.48**	**2.10**	**1,858**	**43.7**	**2.06**
Inferred	946	38.96	2.14	221	43.0	2.06
Total	**4,986**	**40.19**	**2.11**	**2,079**	**43.6**	**2.06**

Based on Total SiO_2 < 5% cut-off , thickness ≥ 2m, dry bulk density of 1.91 t/m²

Bauxite DSO: Project Optimization

Objectives:

- Min CAPEX
- Speed up the Project
- Social Aspects
- Min OPEX, Long-Term Basis

Solutions:

It was defined several independent small and medium size producers along the transportation route which are ready to join up to the Corridor.

Positions	Optimizing of Economic Parameters	
	Before	After
CAPEX, $mn	150	50
OPEX, $/t	23	17
Time, months	18	6

Transportation Scheme:

Bauxite will be delivered to Kokaya River Port by Trucks, then transported by shuttle barges and transshipped into Capesize vessel in offshore area (~52km from the River Port)

Outcomes:

Thus, the idea of infrastructure projects appeared:

- Multiuser Port in Boffa
- Multiuser Railway
- Industrial Zone in Boffa, including:
  - Bauxite Terminal;
  - Container Terminal;
  - Oil-Tanker Terminal;
  - Alumina Terminal.

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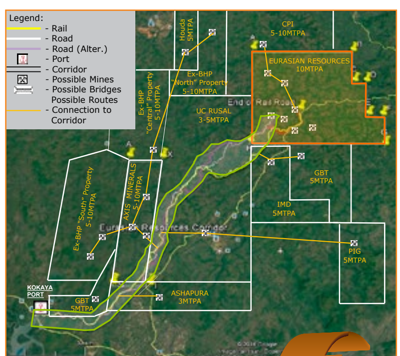
zotov@er-bauxite.com



around 15 million mt/y of aluminum ore. The success of these two companies has arguably laid the footwork for standout projects like Guinea Alumina Corporation (GAC), which was acquired by aluminum producer Emirates Global Aluminum (EGA) as a strategic effort to secure a vertically integrated supply chain. GAC is in the initial construction stages of developing its bauxite mine in the Boké region of northwest Guinea in addition to associated export facilities, which should see completion in 2019.

However, much of Guinea's impressive bauxite resources will largely remain untapped if the country's undeniable infrastructure problems are not addressed. The lack of a strong network of transit links augments the CAPEX in many Guinean projects because access to the sea remains a formidable challenge given the remoteness of many deposits, not to mention the need for more ports. Some international investors have diversified their activities from mining to develop the infrastructure themselves. "The new company called "Eurasian Corridor" was registered to promote the idea of a multiuser corridor," explained Alexander Zotov, managing partner of the mining company Eurasian Resources, which incorporated a new company that will simultaneously develop the associated infrastructure needs of its bauxite project, which includes a port that will be capable of exporting 40 million mt/y of bauxite and 1.2 million mt/y of alumina. "Through these efforts, the project will benefit and the company will also be able to service other companies," he elaborated.

Resource estimates of the company's project show a deposit of 5 billion mt of bauxite with a grade of 40% and 2 billion mt with an average grade of 44% Al2O3 and 2% SiO2.

Alliance Mining Commodities (AMC) has faced similar issues with its Koumbia project, which will therefore be divided into two phases to direct initial investment of US$100 million to the construction of a mine and a port at Rio Nuñez. "While this plan has downsized the project, it gives us the opportunity to attract investors because it is more realistic," said André Baya, director general of AMC.

The government's imperative to introduce greater levels of in-country value addition to its bauxite sector will be a critical development in promoting a sustainable and inclusive industry. While the integration of alumina factories into the value chain may seem like a natural progression given the country's prolific bauxite reserves, the prohibitive costs of building these capital-intensive assets has so far prevented companies from viewing the return on such a daunting investment as economical. This again returns to the issue of infrastructure in the country, specifically in relation to its power capacity. "In order to expand into the more industrial side of the business, you still face significant challenges with electricity in the country which is unfortunate because Guinea has significant potential for hydropower," explained Aissata Beavogui, director general of GAC.

The country is home to the sources of the Niger, Gambia and Senegal Rivers, and the Guinean government has promulgated a strategy to recognize the nation's potential energy output, largely through hydro initiatives. Guinea only has 368 MW of installed hydropower capacity, a number it reached following the commission of the 240 MW Kaleta project in 2015. However, the 515 MW Souapiti hydropower project should come online in 2019, and could be a game-changer for the country.

Developments in the power sector might be a prerequisite to any sweeping developments in the construction of refineries, but investment continues despite the challenges. SMB announced plans in 2017 to invest US$3 billion into the construction of a refinery capable of producing 1 million mt/y of alumina, most of which will be exported to China. Construction on the project is scheduled to begin in 2019 after the completion of environmental impact and feasibility studies, with operations commencing as soon as 2022. Part of the investment will include a 75 mile railway connecting SMB's mines in Boké to the refinery's location in Dapilon.

Periodic outbursts of violence throughout 2017 in the mining hubs of Kamsar and Boké suggest that private and state stakeholders will need to better engage with communities where mining operations take place as a final sociopolitical obstacle towards Guinea's ascendance to greatness. However, if investors can overcome their previous aversions to Guinea in order that the country may secure the capital to develop its facilities, there is no reason this well-endowed nation will not succeed. •

Cote d'Ivoire

Population: 24,184,810
Land Area: 322,463 sq km
Official Language(s): French
Capital: Yamusukro
Head of Government: Prime Minister Amadou Gon COULIBALY (since 11 January 2017)
GDP (PPP): $87.91 billion (2016 est.)
Growth Rate: 7.7% (2016 est.)
GDP per Capita: $3,600 (2016 est.)
Economic Sector Breakdown: agriculture: 19.5%, industry: 28.3%, services: 52.2% (2016 est.)
Exports: $11.77 billion (2016 est.)
Imports: $8.524 billion (2016 est.)
Major Trade Partners: Netherlands, France, Nigeria, China

IBRAHIM INDEX OF AFRICAN GOVERNANCE (2017)

SOURCE: MO IBRAHIM FOUNDATION

2016 Rank (Out of 54)
20

2016 Score (Out of 100)
54.2

Safety & Rule of Law
58.9

Sustainable Economic Opportunity
50.0

Participation & Human Rights
54.1

Human Development
53.9

TAXATION RATES

SOURCE: PWC

Corporate Income Tax Rate
25%

Royalties
3-6%

MINING SECTOR CONTRIBUTION TO GDP

SOURCE: AFRICAN ECONOMIC OUTLOOK

2015
1%

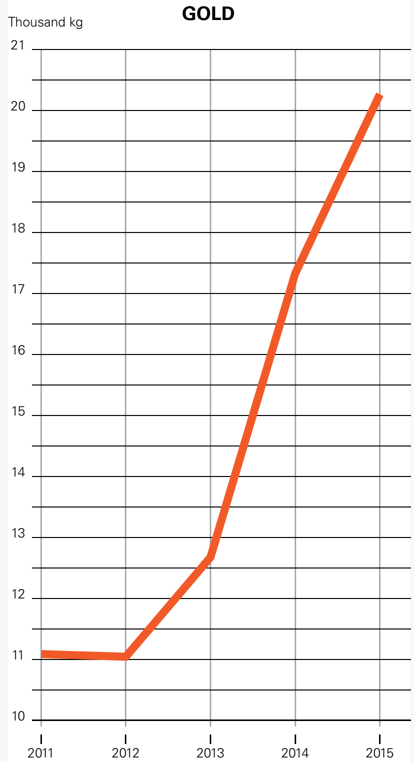
BUSINESS ENVIRONMENT RANKING IN AFRICA (out of 47 sub-Saharan countries)

SOURCE: WORLD BANK

	2015
Ease of Doing Business	17
Starting a Business	5

MINERAL PRODUCTION

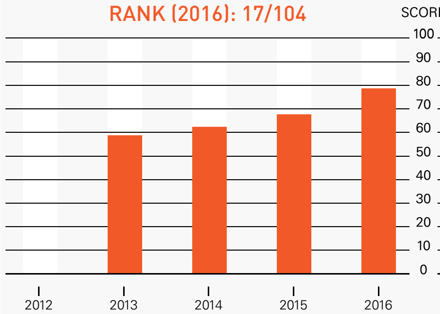
SOURCE: BRITISH GEOLOGICAL SOCIETY



FRASER INSTITUTE INVESTMENT ATTRACTIVENESS INDEX

SOURCE: FRASER INSTITUTE

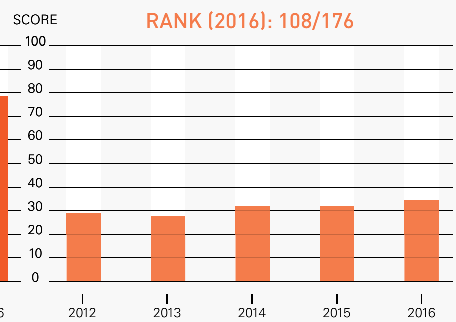
RANK (2016): 17/104



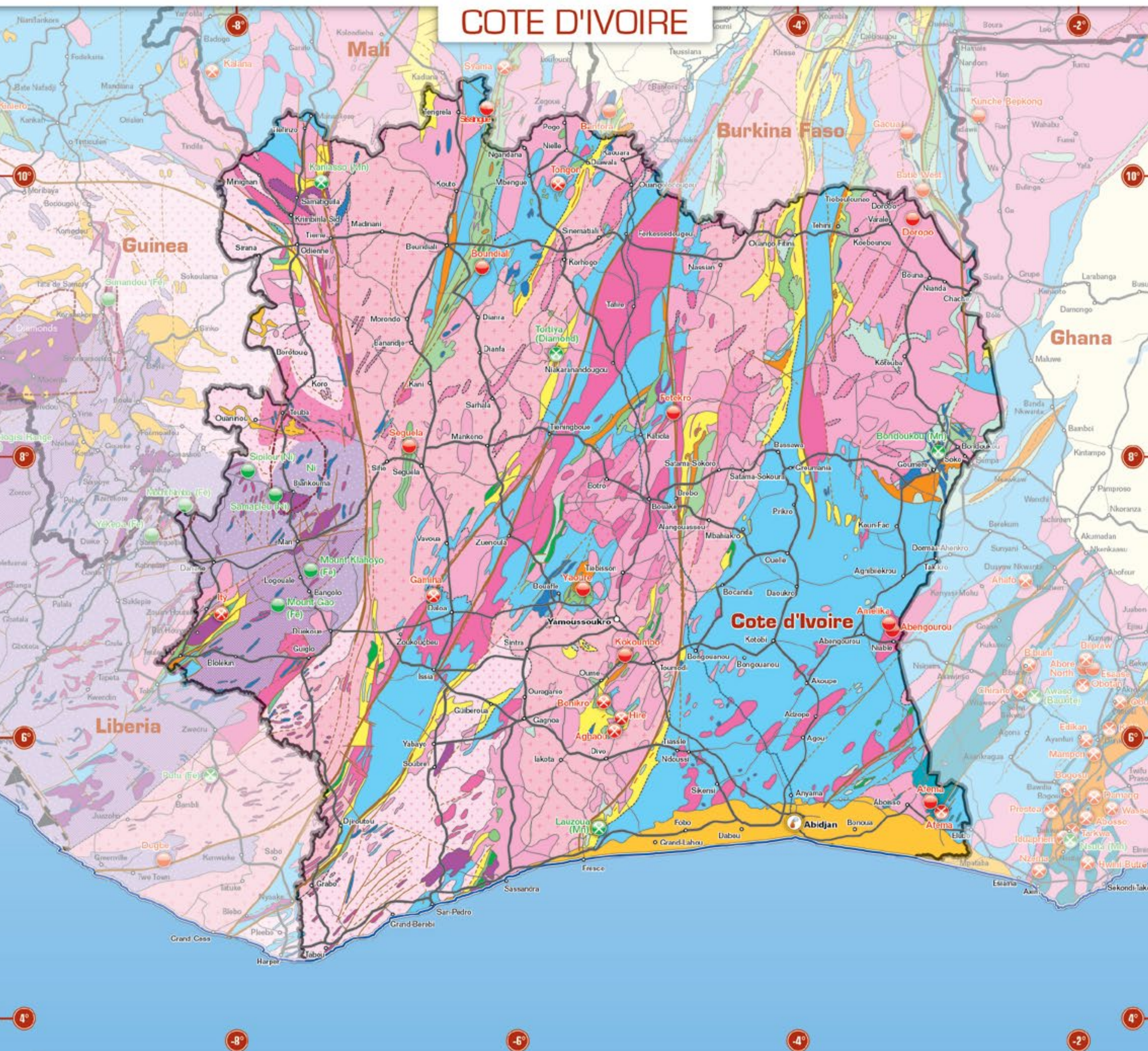
TRANSPARENCY INTERNATIONAL CORRUPTION PERCEPTIONS INDEX

SOURCE: TRANSPARENCY INTERNATIONAL

RANK (2016): 108/176



COTE D'IVOIRE



Your feet on the ground in Africa

NORTH

0 50 100 150
KILOMETERS

- Geological boundary certain
- Fault certain
- Thrusts
- Geological boundary inferred
- Fault inferred

GOLD MINES
- Existing
- Closed
- Gold resources/ projects

OTHER MINERALS
- Existing mines
- Closed mines
- Projects
- Mineral fields
- Country Borders
- Roads
- Seaside
- Minor roads
- Railway
- Sems Offices

POST-EBURNEAN ANOROGENIC DOMAINS
- Basic-ultrabasic complexes (Freetown, Guinea)
- Cretaceous to Recent
- Upper Proterozoic to Paleozoic

EBURNEAN OROGENIC DOMAIN

LOWER PROTEROZOIC TERRANES (2.4 - 1.6 Ga.)

Plutonic rocks
- Basic-ultrabasic complexes
- Leucogranite
- Undifferentiated granitoids

Volcanic and fluviodeltaic formations

Lithostructural assemblages (D2 and D3 deformation phases)
- Fluviodeltaic: sandstone, conglomerate, argillite (Tarkwaian)
- Plutonic-volcanic assemblage: minor volcanic rocks
- Undifferentiated volcanics, volcanosedimentary rocks
- Komatiitic to tholeiitic basalts
- Rhyodacitic to rhyolitic volcanic rocks, chert (b), graphitic horizons
- Andesitic volcanic rocks, chert (b), graphitic horizons
- Basic volcanic rocks, chert (b), Mn levels (c)

Flysch-type formations with minor volcanic rocks - Lithostructural assemblage (D1 to D3 deformation phases)
- Carbonates felsic volcanic rocks
- Felsic volcanoclastic rocks, dykes; chert (b), manganese levels (c)
- Flysch-type : sandstone to argillite (graphitic, conglomeratic levels)

Horizon Markers (B2, B1)
- Tourmaline-bearing sandstone and conglomerate
- Chert and quartzite levels
- Manganses-rich levels: quartzite, gondite, phyllite

ARCHEAN AND/OR PROTEROZOIC GRANITIC GNEISS COMPLEXES DEFORMED BY THE EBURNEAN OROGENESIS
- Granitic, migmatitic and undifferentiated gneiss
- Granitic, migmatitic and undifferentiated gneiss
- Granite, gneiss, and migmatitic gneiss complexes

PRE-EBURNEAN OROGENIC DOMAIN

ARCHEAN - LEONIAN (3.5 - 2.9 GA.) / LIBERIAN (2.9 - 2.5 GA.)

Plutonic rocks
- Undifferentiated plutonic rocks (Leonian to Late-Liberian)

Greenstone belts and ironstone formations
- Ironstone formation (meta-sedimentary, meta-basic rocks associated)
- Basic and ultrabasic formations

Gneissic complexes
- Migmatitic and undifferentiated gneisses
- Granulitic gneiss "basement"

GEOLOGICAL DATA FROM BRGM - LAT/LONG WGS84
Map drafted by Kwaku Owusu-Ansah

2018 - 4th edition - info@sems-exploration.com

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SEMS EXPLORATION | THE AFRICAN GEOLOGICAL CONSULTANCY GROUP

Leading Industry Insights

"The question of adding value is very important in African mining; this is not specific to Cote d'Ivoire. The government is working in collaboration with local mine operators and the World Bank to develop strategies to improve local content. Firstly we want to ensure that, where possible, all supplies to the mine are handled by local companies and the reliance on imports is minimized. Right now, we are working with one of the local mines directly to help them increase the level of local participation in their supply chain. In parallel, we are introducing fiscal incentives for mineral processing; the more beneficiation carried out in-country, the less tax you pay. Also, in the nickel and bauxite projects, we have asked the companies to invest in the processing units."

- Hon. Minister Jean Claude Brou,
Cote d'Ivoire Ministry of Industry and Mines

"Cote d'Ivoire continues to be a top mining destination and has the strongest economic growth in the region. Mining activity across the country is facilitated by our quality road system, with easy access to our principal ports in Abidjan and San Pedro, which are currently being developed. We also have good water and our power generation is the best in the region. Abidjan is the favored destination for regional headquarters for mining companies and exploration players; it is a great city with access to 4G internet and good flight connections in the region."

- Eric Kondo, Managing Partner,
Mining Services and Consulting (MS&C)

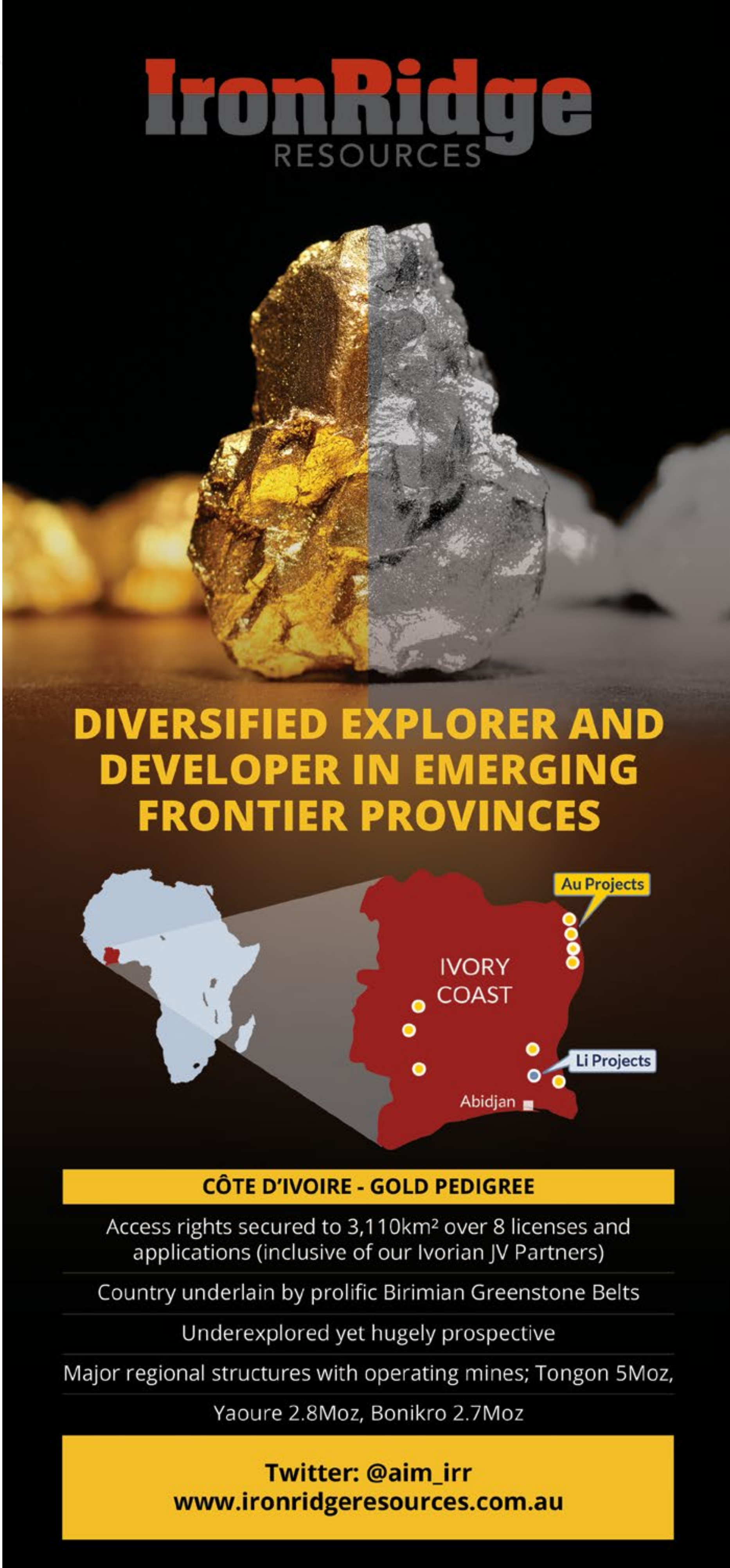
"Once we have generated sufficient cash from the Edikan and Sissingué operations, and arranged a suitable debt financing package, we will be able to accelerate the development of our third mine, the Yaouré project that is also in Côte d'Ivoire. When operating in West Africa, things can change quickly so we want to maintain a spread of risk, both political and technical. We have been a single mine operation for some time, and if something were to happen to that mine, we would encounter problems. A secondary revenue source is therefore vital to achieving a reliable income stream."

- Jeff Quartermaine, Managing Director and CEO,
Perseus Mining

Cote d'Ivoire

The economic capital, Abidjan, is fast becoming a regional hub for mining as Cote d'Ivoire's resource industry continues its fast development.

This country of 23 million inhabitants has emerged as one of the continent's brightest economic spots, as the 2014 move of the African Development Bank's headquarters to Abidjan attests. After decades of political turmoil and civil unrest, investors in the mining sector have turned their eyes to Cote d'Ivoire as one of the most attractive jurisdictions. A favorable mining code intro-duced in 2014 aims to double gold production and has resulted in a major elevation of Cote d'Ivoire's position on the Fraser Institute's Investment Attractiveness Index for mining, ranking 17th in 2016, the best-ranked African country and placed above global mining powerhouses Peru and Chile. Moreover, growth on annual mining value is expected to average 15% per annum until 2021. While the regulatory conditions have been designed to entice foreign investment, investors should be cautious in expecting such ideal circumstances to remain in place in the longer term. In 2017, the Minister of Mines decided to amend several key incentives in the mining code, in-clud-



ing reducing the tax exemption period following the commencement of commercial opera-tions from five years to one. "At the Chamber of Mines we think this is a big mistake and could deter investment. It is important that both the public and private sector nurture their relationships to build a bright long-term future for the mining industry," said Eric Kondo, managing partner at Mining Services and Consulting (MS&C).

Nonetheless, in general investors communicate a shared believe that the political stability in the country will remain a fundamental imperative of the acting administration, including efforts to maintain a favorable regulatory climate for foreign investors. "The current objective of the gov-ernment is to rebuild Cote d'Ivoire as quickly as it can," explained Hervé Boyer, managing direc-tor at Stanbic Bank Cote d'Ivoire. "The country went through difficult times, but we are now be-ginning to see huge improvements. With the government's efforts to rebuild the country, they are not going to inhibit international investment."

Against this backdrop, exploration and development stage projects keep gaining traction and there have been several exciting developments in the production space as well as a reshuffling in the ownership of assets. In December 2017, Newcrest Mining signed an agreement to sell 89.89% of its interest in the Bonikro operation in Cote d'Ivoire to F&M Gold Resources and Africa Finance for US$72 million, retaining a royalty to the estimated value of US$9 million that applies to the first 560,000 ounces of gold production. However, the company will maintain its presence in Cote d'Ivoire through exploration concessions, including the Séguéla project where drilling has commenced. Earlier in 2017, London-based Endeavour Mining agreed to pay US$52 million in order to raise its stake from 55% to 80% in the Ity mine to state-owned mining firm SODEMI. The company intends to invest US$412 million to extend the life of the Ity mine by 14 years through the construction of a Carbon-in-Leach (CIL) plant that will allow the asset to produce 144,000 ounces of gold annually for nine years.

Perseus Mining envisages its Sissingué project in northern Cote d'Ivoire entering production by the second quarter of 2018, adding 70,000 ounces per annum of gold to the company's overall production and ushering in a new era for Perseus as a mid-tier player operating across multiple jurisdictions. Revenue from Sissingué, combined with the production at its Edikan mine in Ghana, should help the company to finance the final stages of its Yaouré project in Cote d'Ivoire, allowing it to achieve its goal of operating three mines by 2020. Speaking about the opportunities of oper-ating in West Africa and Cote d'Ivoire at this particular time, Jeff Quartermaine, managing director and CEO at Perseus, said: "When we began work on the Sissingué project it was ideal timing because of the lack of activity in the global sector allowed us to engage contractors at relatively low rates in comparison to those that might apply in a bull market for gold globally."

Cote d'Ivoire's portion of the Birimian Greenstone belt keeps much of the activity focused on gold, however, spreading the risk by reducing the sector's dependency on the price of gold will allow a more sustainable market to develop. In this vein, market trends are beginning to push diversification initiatives to explore this still widely underdeveloped mining jurisdiction, including a recent flood of investors in manganese, lithium, and nickel projects. AIM-listed IronRidge Re-sources initially intended to add a project in Cote d'Ivoire to extend its lithium portfolio in Ghana, but now holds projects across both lithium and gold. "Gold is potentially a steady growth story, whereas we like lithium because it has an exponential growth story," said Vincent Mascolo, man-aging director and CEO at IronRidge Resources. The company has invested US$1.5 million into Cote d'Ivoire.

Image courtesy of Perseus Mining Limited

Cote d'Ivoire hosts an array of opportunities for the company willing to see challenges as oppor-tunities, and the promising developments in Cote d'Ivoire's mining sector have caught the atten-tion of the entire mining value chain. A flood of service providers have entered the market and are gearing up to meet the expected growth in demand for their services as the industry ma-tures. "One of our business models is to look for companies wanting to enter the West African market and build partnerships," said Stanislas de Stabenrath, managing director of X&M Suppli-ers. "Since entering the market can be very costly, we can offer a good base for companies to come in only with consignment stock and then develop a strategy for the region together."

Labo Bio Connex Analytique (LBCA), a local laboratory and testing services, has seen an oppor-tunity in the lack of local metallurgical players. Over the next year, the company is partnering with a lab in South Africa to develop its capacity to meet growing demand from the mining sector by setting up a dedicated minerals lab in the capital. "Our headquarters is in Abidjan, which is a hub for activity and the business will grow according to the opportunities we secure here," said LBCA's managing director, Roger Bele-Binda. "From there, we will set up some satellite labs de-pending on our projects."

Cote d'Ivoire is one of the top designations for mining investment in Africa and appears on track to remain so for years to come. Sustained political stability and improvements to the country's infrastructure will be key developments going forward, but the outlook for the country looks strong if the buzz in the nation's economic capital, Abidjan, is an indication. "Many large foreign companies coming from France, the U.S. and Canada have put their headquarters for the West Africa region in Abidjan," confirms Eric N'guessan, managing partner of EY Cote d'Ivoire. "These companies will not be willing to lose their investment because of political quarrels. Their confi-dence in Abidjan is a positive sign." •

Mali

Population: 17,885,245 (July 2017 est.)
Land Area: 1,240,192 sq km
Official Language: French
Capital: Bamako
Head of Government: Prime Minister Abdoulaye Idrissa MAIGA (since 8 April 2017)
GDP (PPP): $38.25 billion (2016 est.)
Growth Rate: 5.8% (2016 est.)
GDP per Capita: $2,100 (2016 est.)
Economic Sector Breakdown: agriculture: 40.7%, industry: 19%, services: 40.2% (2016 est.)
Exports: $2.803 billion (2016 est.)
Imports: $3.443 billion (2016 est.)
Major Trade Partners: Switzerland, India, China, Senegal, France

IBRAHIM INDEX OF AFRICAN GOVERNANCE (2017)

SOURCE: MO IBRAHIM FOUNDATION

2016 Rank (Out of 54)

25

2016 Score (Out of 100)

51.9

Safety & Rule of Law

56.2

Sustainable Economic Opportunity

49.7

Participation & Human Rights

50.8

Human Development

51.0

TAXATION RATES

SOURCE: PWC

Corporate Income Tax Rate

30%

Royalties

3%

MINING SECTOR CONTRIBUTION TO GDP

SOURCE: AFRICAN ECONOMIC OUTLOOK

2014

5.8%

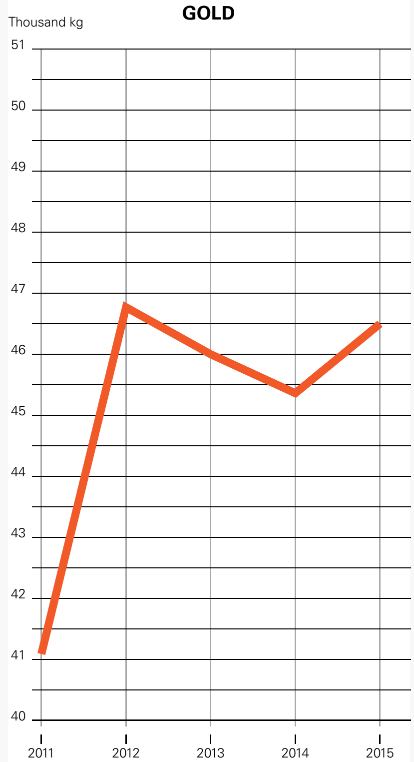
BUSINESS ENVIRONMENT RANKING IN AFRICA (out of 47 sub-Saharan countries)

SOURCE: WORLD BANK

	2015
Ease of Doing Business	19
Starting a Business	16

MINERAL PRODUCTION

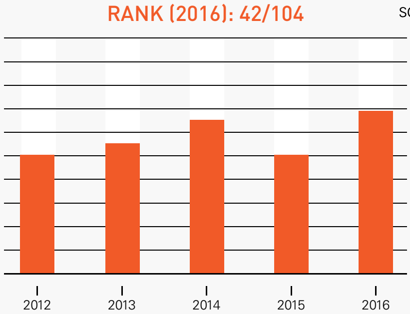
SOURCE: BRITISH GEOLOGICAL SOCIETY



FRASER INSTITUTE INVESTMENT ATTRACTIVENESS INDEX

SOURCE: FRASER INSTITUTE

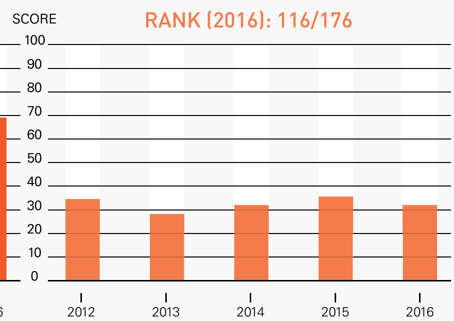
RANK (2016): 42/104

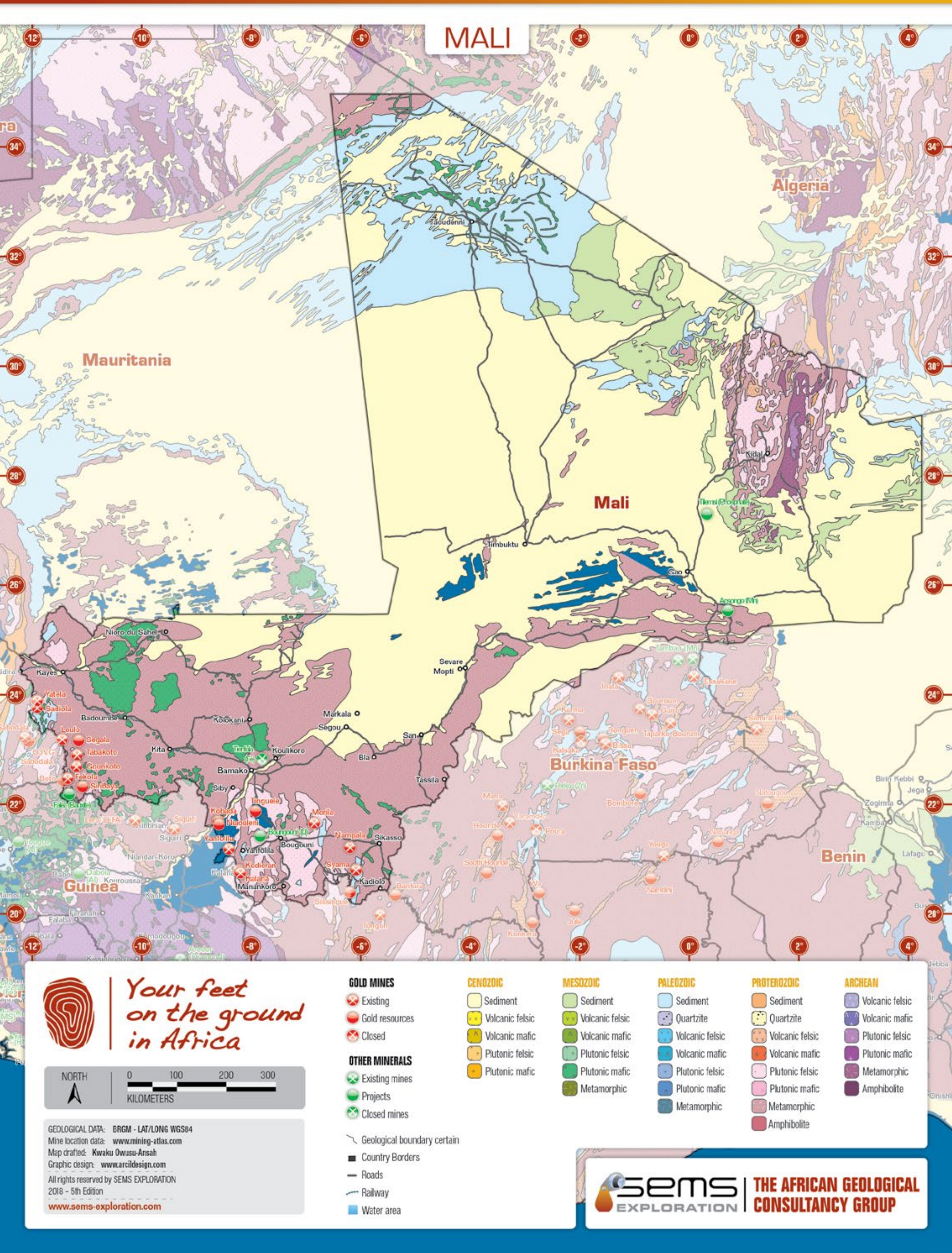


TRANSPARENCY INTERNATIONAL CORRUPTION PERCEPTIONS INDEX

SOURCE: TRANSPARENCY INTERNATIONAL

RANK (2016): 116/176





MALI
Algeria
Mauritania
Mali
Burkina Faso
Guinea
Benin
Taoudenni
Kidal
Timbuktu
Gao
Tilemsi (Phosphate)
Ansongo (Mn)
Tambao (Mn)
Nioro du Sahel
Kayes
Yatela
Sadiola
Badoumbe
Loulo
Segala
Tabakoto
Gounkoto
Fekola
Sinbaya
Kolokani
Kita
Koulikoro
Bamako
Siby
Markala
Segou
San
Bla
Sevare
Mopti
Tassila
Tinguele
Kobada
Niaouleni
Morila
Yanfolila
Bougouni
Nampala
Sikasso
Kodieran
Kalana
Syama
Kadiolo
Manankoro
Essakane
Inata
Samira Hill
Your feet on the ground in Africa
NORTH
0 100 200 300
KILOMETERS
GEOLOGICAL DATA: BRGM - LAT/LONG WGS84
Mine location data: www.mining-atlas.com
Map drafted: Kwaku Owusu-Ansah
Graphic design: www.arcildesign.com
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GOLD MINES
Existing
Gold resources
Closed
OTHER MINERALS
Existing mines
Projects
Closed mines
Geological boundary certain
Country Borders
Roads
Railway
Water area
CENOZOIC
Sediment
Volcanic felsic
Volcanic mafic
Plutonic felsic
Plutonic mafic
MESOZOIC
Sediment
Volcanic felsic
Volcanic mafic
Plutonic felsic
Plutonic mafic
Metamorphic
PALEOZOIC
Sediment
Quartzite
Volcanic felsic
Volcanic mafic
Plutonic felsic
Plutonic mafic
Metamorphic
PROTEROZOIC
Sediment
Quartzite
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Volcanic mafic
Plutonic felsic
Plutonic mafic
Metamorphic
Amphibolite
ARCHEAN
Volcanic felsic
Volcanic mafic
Plutonic felsic
Plutonic mafic
Metamorphic
Amphibolite
SEMS EXPLORATION
THE AFRICAN GEOLOGICAL CONSULTANCY GROUP

Hon. Minister Tiémoko Sangaré

Ministry of Mines above Mali
Mali

Historically, Mali has been a center for gold production. What are the priorities for the Ministry in 2018?

Gold has been exploited in Mali for centuries, but the production really started to increase during the 80's. Mali produces approximatively 50 tonnes per year and we currently have 10 mines operating with two more schedule to come online very soon. However, the mineral potential of Mali is not fully recognized and we are looking to develop other resources. To achieve this, our first priority for 2018 is to improve the legal framework for the mining sector. We will revise the mining code, which was redacted in 2012, and adapt it to better fit the current state of the industry. We identified several gaps that we would like to improve. For example, the current mining code allows a company to hold an exploration license for 30 years, which is very long comparing to other mining jurisdictions around the world. We would like to decrease this time to 15 years, and to end the consolidation of mining titles, which allows companies that have several mining licenses to pay taxes for their overall income. We think it will be fairer to have them pay taxes for each exploitation that they have separately.

What is the Ministry's strategy when it comes to improving artisanal mining?

We aim to give a legal existence to artisanal mining. We are willing to organize and promote small-scale mining because it can benefit the local communities in terms of wealth, employment and development. Small-scale mining is the best way for Malians to truly take advantage of their own mineral resources as the money generated by these activities will remain in the country. The mining sector will be then more linked to the overall economy. We think Malians have the potential to turn small-scale mines into large-scale mines if they have the proper tools to help them.

Considering this priority, what is your position regarding international investment? How can foreign investors work in partnership with local players ?

Our strategy will be to improve the "corridors" that already exists, meaning the areas within a mine site that can legally be exploited by artisanal miners. This is something that we legalized and other countries have taken Mali as an example for their own similar initiatives. The second thing we would like to implement is partnerships between mining companies and small-scale miners. International mining companies could have shares in a small-scale mine for example, helping local workers to organize and structure their activity. This is something that B2Gold is doing in Nicaragua and it works.
As part of developing small-scale and artisanal mining, we are also currently working on a partnership with the World Bank to put in place facilitated options for local miners to finance their activity.

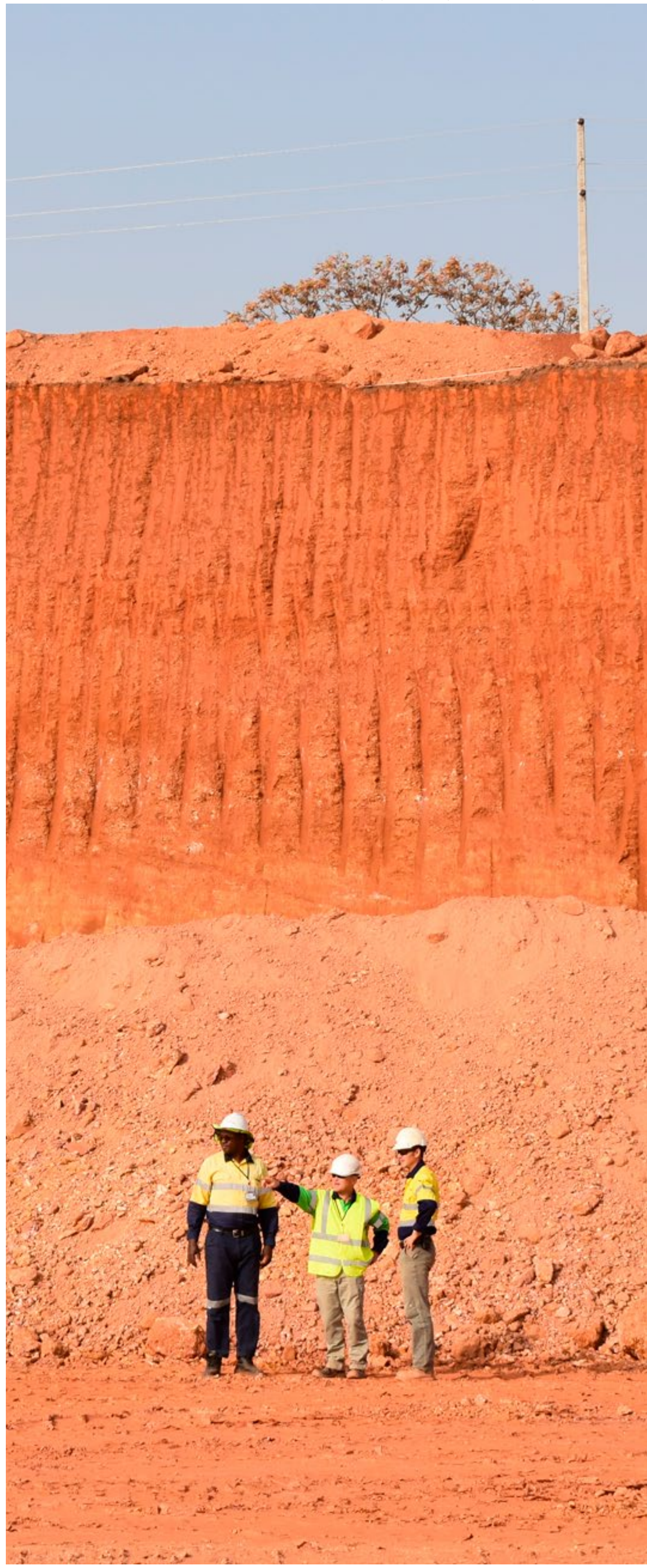
How can improving the conditions for artisanal miners benefit the overall industry?

Another priority for us is to increase the amount of gold that we are producing. I mentioned earlier that Mali produces around 50 tonnes of gold per year. This number does not include artisanal mining production. We traditionally believed that artisanal mining represents 4 tonnes per year, but last year, custom officers found a total of 20 tonnes of gold. And even better, this year, from January to April, they have already found a total of 16 tonnes. We have all reasons to believe that by developing artisanal mining, Mali will be able to produce around 100 tonnes per year.

What potential to diversify out of gold exists in Mali?

Mali remains untapped and currently we are starting a large mapping plan in the western part of the country to be expanded subsequently into the southern region. We would like to find other gold deposits because aging mines such as Morila are reaching their end. As part of this overall mapping program, we want to encourage diversification. This year, we granted 20 exploration licenses for gold, but also three for bauxite, five for diamonds, two for iron ore, three for manganese, one for rare-earths elements, one for nickel, one for baryte, two for copper, six for uranium, two for lithium, one for coal and five for phosphate. These licenses have been mostly granted to foreign companies. •

Image courtesy of Hummingbird



Mali

The mining community remains unfazed by security issues and 2017 witnessed important new developments in gold and other resources.

A terror attack left two dead in a resort near the capital city of Bamako in June 2017, leaving many to suggest that despite two years of French military intervention, Mali remains in a precarious position. The mining community, however, continues to insist that security does not pose a significant threat to investment. Despite the consequences of ongoing conflict in its northern territories, Mali's strong portfolio of projects is a testament to its standing amongst the top African gold giants. Home to several major operators including AngloGold Ashanti, Resolute Mining, and IAMGOLD, a series of exciting developments came to fruition in 2017. B2Gold's new Fekola mine in southwest Mali poured first gold at the end of November 2017, four months ahead of schedule and finished the year producing 111,450 ounces, far surpassing original estimates in the range of 45,000 to 55,000 ounces. In 2018, the company expects to produce no less than 300,000 ounces, bringing B2Gold's forecasted consolidated gold production to between 910,000 and 950,000 ounces in 2018. Hummingbird Resources' Yanfolila gold mine also poured first gold just before 2017's end and expects to reach nameplate production figures in its first full year of operation with a target of 130,000 oz/y. "We have over 1 million oz of gold in resources outside of the current mine plan at Yanfolila, which we will look to convert to reserves," said Robert Monro, head of business development for Hummingbird. "That way we could potentially increase the mine life from 7.5 years to hopefully over 10."

Representing its second asset in the country, Endeavour completed an acquisition of Avnel Gold Mining in September 2017, to take control of the Kalana mine. Its plans for the assets include an exploration campaign throughout 2018 on both the Kalana deposit and nearby targets including Kalanako. "Two years ago, we were spending only US$10-12 million on exploration," said Sébastien de Montessus, president and CEO of Endeavour, speaking about the company's plans for its extensive West African portfolio. "In 2016 we made exploration a strategic priority to ensure long-term growth and we have spent US$40 million in 2017 alone and this is having a significant impact. We believe that our next big project should come from exploration and not acquisition."

Aging mines such as Randgold's Morila imply that exploration will indeed be critical to the industry's survival. Mapping initiatives are in place to better understand the geology in the western

CHANGING PRICE OF GOLD

SOURCE: NASDAQ

Latest Price & Chart for CBOT Gold 100 oz.

End of day Commodity Futures Price Quotes for Gold (COMEX)

> *Introducing a lithium project to London's AIM takes a lot of meetings and discussions about what we are doing as it is still a relatively undeveloped lithium market, whereas Canada and Australia are more advanced, but lithium is clearly a longer-term metal and not a bubble that will burst.*
>
> *- Bernard Aylward, CEO, Kodal Minerals*

and southern regions of the country where Mali's potential remains widely untapped, but not just in terms of gold. The government has put in place a mandate to promote the country's diverse mineral potential, specifically touting the opportunities in iron ore and lithium. Kodal Minerals acquired the Bougouni lithium project in 2016, which has the potential to produce high-grade spodumene. The company says that although the notion of lithium in Mali has been a surprising one to many people, the response to the project has been largely positive. "There is recognition that Mali is a major mining country, hence confidence that we will be able to develop," said Bernard Aylward, CEO. "Lithium is a new commodity for Mali and we still need to prove these milestones in terms of mining, trading and exporting."

Another key initiative that the government will prioritize in 2018 is managing the country's artisanal mining. Dating back to the height of the Mali Empire in the thirteenth century, Malians have been involved in the sub-Saharan trade of gold, and in the modern day, the government estimates that as much as 20 tonnes of unaccounted gold are moved across the border annually by the country's artisanal miners. Wishing to formalize this lost revenue in the economy, the ministry is working to introduce mutually beneficial structures to provide artisanal miners with better access to information and tools through the creation of legalized corridors, a model adopted from Mali by other nations as exemplary. In terms of involving large-scale investors in the process, the ministry is hoping to facilitate partnerships between mining companies and small-scale mining operations. While this model may eventually prove

Image courtesy of Hummingbird

an effective mechanism, illegal mining remains a conundrum for many international companies. Fatoumata Sidibe-Diarra, managing partner at local Malian law firm FSD Conseils, suggests clients engage with community members living on or around their property to ward off any potential tensions. "This is critical because if a dispute arises, the company will need someone trusted on both sides to help address the issue, and if there is artisanal mining happening on their ground, they have someone to inform them of what is happening," she said.

As recent events across the globe demonstrate, terrorism is a grim facet of the modern world that is not limited to developing countries. Mali's mining sector will undoubtedly continue to face prejudice as long as the conflict in the north continues, but after several years of adapting to the real or perceived risks of operating in a country painted red by the international community, the sector seems largely to have adopted a "business as usual" attitude. Moving forward, the challenges in respect to Mali's mining sector will center more on how the government will approach the integration of small-scale and artisanal miners into the sector and, more broadly, the involvement of a wider breadth of Malian society. Moreover, reforms to the mining code will be crucial to modernizing the regulatory environment without sacrificing its largely popular policies amongst the foreign investment community. Nonetheless, with a strong forecast for gold prices in the coming years and a strategy in place towards diversification across commodities, Mali is on track to maintain its consistent position among Africa's top mining destinations. •

"

If you look at attacks on tourists, you had two attacks on tourists in Bamako in Mali, two attacks in Ouagadougou in Burkina Faso and one in Côte d'Ivoire. Yet in London, there have been six in the past year. At least in West Africa you often know where they may strike... The perception needs to be changed.

- Sébastien de Montessus, President and CEO, Endeavour

"

Senegal

Population: 14,668,522 (July 2017 est.)
Land Area: 196,722 sq km
Official Language: French
Capital: Dakar
Head of Government: Prime Minister Mohammed Abdallah Boun DIONNE (since 4 July 2014)
GDP (PPP): $39.64 billion (2016 est.)
Growth Rate: 6.7% (2016 est.)
GDP per Capita: $2,500 (2016 est.)
Economic Sector Breakdown: agriculture: 17.2%, industry: 23.7%, services: 59% (2016 est.)
Exports: $2.498 billion (2016 est.)
Imports: $4.993 billion (2016 est.)
Major Trade Partners: Mali, Switzerland, France, China

TAXATION RATES

SOURCE: PWC

Corporate Income Tax Rate

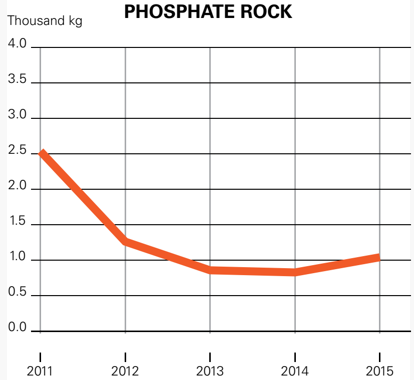
30%

Royalties

1-5%

MINERAL PRODUCTION

SOURCE: BRITISH GEOLOGICAL SOCIETY



IBRAHIM INDEX OF AFRICAN GOVERNANCE (2017)

SOURCE: MO IBRAHIM FOUNDATION

2016 Rank (Out of 54)

10

2016 Score (Out of 100)

61.6

Safety & Rule of Law

65.2

Sustainable Economic Opportunity

54.9

Participation & Human Rights

68.3

Human Development

58.0

MINING SECTOR CONTRIBUTION TO GDP

SOURCE: AFRICAN ECONOMIC OUTLOOK

2015

>5%

BUSINESS ENVIRONMENT RANKING IN AFRICA (out of 47 sub-Saharan countries)

SOURCE: WORLD BANK

	2015
Ease of Doing Business	18
Starting a Business	9

FRASER INSTITUTE INVESTMENT ATTRACTIVENESS INDEX

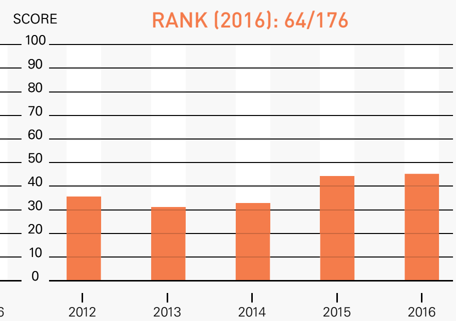
SOURCE: FRASER INSTITUTE

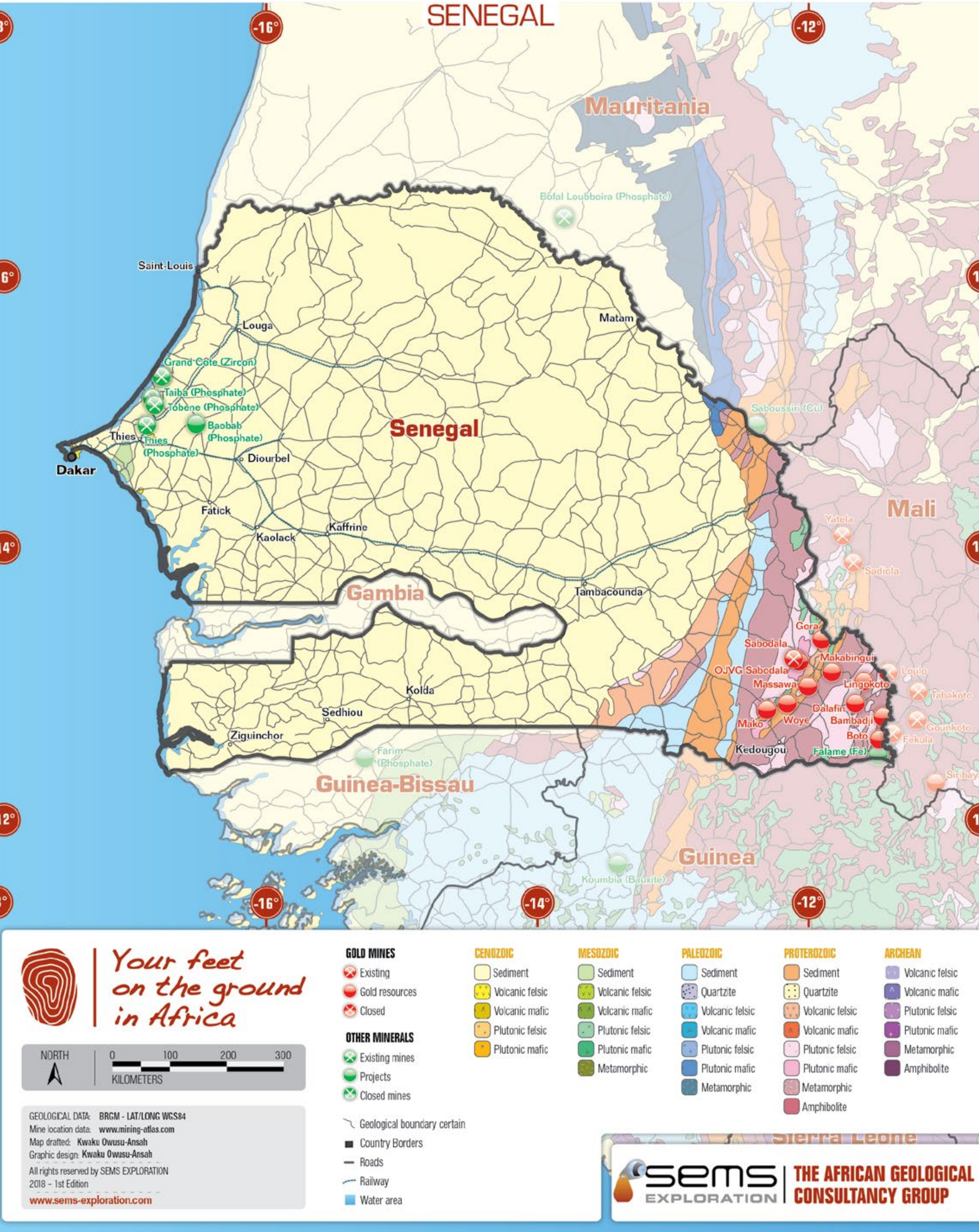
RANK (2016): -/104

TRANSPARENCY INTERNATIONAL CORRUPTION PERCEPTIONS INDEX

SOURCE: TRANSPARENCY INTERNATIONAL

RANK (2016): 64/176




SENEGAL
-16°
-14°
-12°
Mauritania
Bofal Loubboira (Phosphate)
Saint-Louis
Louga
Matam
Grand Cote (Zircon)
Taiba (Phosphate)
Tobene (Phosphate)
Baobab (Phosphate)
Thies
Thies (Phosphate)
Dakar
Diourbel
Senegal
Saboussiri (Cu)
Fatick
Kaffrine
Kaolack
Mali
Yatela
Sadiola
Gambia
Tambacounda
Gora
Sabodala
Makabingui
OJVG Sabodala
Loulo
Massawa
Lingokoto
Tabakoto
Kolda
Dalafin
Sedhiou
Mako
Woye
Bambadji
Gounkoto
Boto
Fekola
Ziguinchor
Kedougou
Falame (Fe)
Farim (Phosphate)
Siribaya
Guinea-Bissau
Guinea
Koumbia (Bauxite)
Sierra Leone
Your feet on the ground in Africa
NORTH
0
100
200
300
KILOMETERS
GEOLOGICAL DATA: BRGM - LAT/LONG WGS84
Mine location data: www.mining-atlas.com
Map drafted: Kwaku Owusu-Ansah
Graphic design: Kwaku Owusu-Ansah
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Existing
Gold resources
Closed
OTHER MINERALS
Existing mines
Projects
Closed mines
Geological boundary certain
Country Borders
Roads
Railway
Water area
CENOZOIC
Sediment
Volcanic felsic
Volcanic mafic
Plutonic felsic
Plutonic mafic
MESOZOIC
Sediment
Volcanic felsic
Volcanic mafic
Plutonic felsic
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Metamorphic
PALEOZOIC
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Metamorphic
Amphibolite
ARCHEAN
Volcanic felsic
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THE AFRICAN GEOLOGICAL CONSULTANCY GROUP

Senegal

Mining plays an important part in Senegal's rapidly growing economy which oil and gas discoveries will fuel further.

Senegal, one of Africa's oldest democracies, has long been one of the continent's most stable countries. It has recently strengthened its political system by reducing the presidential mandate in 2016 from seven years to five years and establishing a national anti-corruption office. Following the adoption of the 2014 legislation, Plan Senegal Emergent (PSE), which was crafted by McKinsey and designed to increase growth and reduce poverty, Senegal has been one of the best performing economies in Sub-Saharan Africa (SSA) with 6.5% GDP growth in the past two years, much higher than the forecasted 5.1%. GDP has been driven by a 15% increase in 2015 and 13% increase in 2016 of exports, with mining playing a key role in this. Senegal's fiscal deficit is also expected to settle at 3% in 2018 (World Bank) and its inflation rates stand at 0.1%, much lower than the 3% threshold set by the West African Economic and Monetary Union. More promising for Senegal is the diversification of its economy not only in mining, but also agriculture, oil and fishing. The economy is expected to grow by 6.8% in 2018 as it targets becoming a middle-income country by 2035. Furthermore, Senegal is an open country for foreign investment. According to the 2016 World Bank Doing Report, the country has been one of the top 10 business environment improvers in the past two years and is one of the world's top business reformers. It is actively involved in several international investment-related organisations including the African Intellectual Property Organisation and the Multilateral Investment Guarantee Agency.

Deloitte's 2017 Invest in Senegal report stated: "Senegal offers a stable political environment, favourable geographic position and strong institutions with growing opportunities for foreign investment." It also highlighted tax incentives that include a three-year exemption on customs duty for capital goods imports as well as VAT exemption on production and purchase of local products and services. Certain areas for the Senegalese government to address to achieve a sustainable and rapid growth path included reducing electricity production costs, improving infrastructure and diversifying the economy, all issues that the PSE is aiming to tackle.

Infrastructural projects have been a major focus for the government in the PSE, with plans to reduce transportation costs as well as making the country a business hub for services, logistics and industry. A public-private partnership between the International Finance Corporation, the World Bank, the Senegalese government and Eiffage has been created to fund a 230 million euro road project that will build toll roads connecting Dakar with other parts of Senegal. High on President Macky Sall's agenda is to create a logistical and industrial hub outside of Dakar that will reduce congestion in the capital. The creation of a new city to the east of Diamniadio, which will be home to a new airport, university and industrial park funded by China, is key to Sall's desire to double growth by 2020. The government is also looking to begin construction of a modern 1500 km railway line that will link Dakar with Bamako, Mali's capital.

The Government of Senegal has made the development of the power sector a priority in its PSE with the aim of increasing electricity access rates from 55% to 100% by 2025. More exciting for Senegal is the recent discovery of oil and gas by Scottish company Cairn Energy. Having begun frontier exploration in 2012 on the Atlantic Margin, it currently estimates that there are more than 563 million barrels of oil. BP has been in talks with Cairn Energy to acquire a 30% stake of the offshore field, which would be valued at US$600 million. A deal would further boost BP's position in Senegal following a joint venture with Dallas-based Kosmos Energy last year. Total will also be exploring the Senegalese deep-water having acquired a 90% stake in the Rufisque Offshore Profond block, with Petrosen, the Senegalese state-run oil company, holding the remaining 10%. Importantly for Senegal, the World Bank will provide US$29 million credit to Senegal to aid the country's institutional capacities in negotiating complex agreements with the extractive industries. Active engagement with citizens will also be critical in this process to ensure inclusive development and promote transparency from both government and the oil industry. This will be one of the government's main issues as protests continued during 2017 as to how revenue from oil will be distributed.

The development of the renewable energy sector has gathered pace in the past year, with major investment in solar and wind production, including the completion of Senergy 2 by Omexom and VINCI Energies. The 20 MWp solar plant is the largest solar power plant in West Africa and will provide electricity to 160,000 people. Further renewable projects in Senegal include Lekela's 158 MW Taiba N'Diaye wind power project. The project, which consists of 46 Vestas V136 wind turbines, has successfully completed all major development activities, entered into construction arrangements and should be generating energy by the end of 2018. For a country that has some of the highest generation costs in SSA, the project is expected to help reduce the cost of electricity in Senegal.

Senegal has a history of mining phosphates, industrial limestone and attapulgite, and has recently started to diversify its mining activities. It has been one of the leading producers of phosphate globally, with Industries chimiques du Sénégal (ICS) producing over 1 million mt in 2016, while Avenira's Baobab phosphate project is in the process of raising US$53.4 million to increase its production capacity from 500,000 mt/y to 1,000,000 mt/y of high-grade phosphate rock concentrate. Such expansion would place the Baobab project amongst the most competitive globally.

Gold, iron ore, uranium and copper are all mined in Senegal, so that, although mining only contributes to 4% of overall GDP and 1% of national employment, the sector now represents 20% of Senegal's export earnings. President Sall's ambitions include making Senegal one of Africa's top seven gold producers with an annual production of 17 tonnes by 2020. Toro Gold is on schedule and within its budget of US$158 million to deliver gold at its Mako gold mine by Q1 2018, and Canadian-based Teranga Gold, that owns the only commercial gold mine and mill in Senegal, is currently producing over 200,000 ounces of gold per year at the Sabodala gold mine, where 90% of its 1,200 employees are Senegalese. A number of other Canadian-based companies continued their gold exploration in Senegal including Iamgold and Thor Exploration. Iamgold, at their 236 km2 Boto gold project, previously identified an indicated resource of 1.6 million ounces, with an average grade of 1.8g/t AU including 12 metres at 6.39g/t AU and 22 metres at 4.04g/t AU north of the deposit. In 2017, Iamgold continued drilling with the goal of expanding current mineral resources and identifying additional satellite zones. Thor Exploration, at their Douta gold project, completed a 2000 metre RC drilling program on the Makosa prospect. The RC program successfully identified a number of wide, near-surface intersects, notably 9.5 metres at 8.1g/t AU including 6.9 metres at 10.9g/t AU. Astron Ltd., listed on the ASX, has also received a Senegalese mineral sands license for their 397 km2 Niafarang project along the Casamance coast and commenced operations in Q4 2017. Stage 1 of the project, based on a 6km deposit of heavy minerals, has an estimated mine life of 3 years with a probable ore resource of 10.91% HM.

Senegal became a candidate country for the Extractives Industry Transparency Initiative (EITI) in 2013 and, in 2016, launched a major revision of its mining laws and policies. This included an assessment by the Intergovernmental forum (IGF) on mining, minerals, metals and sustainable development. The IGF found that the country's existing laws and policies provided a strong foundation for mining. It also found a clear and transparent permitting process, a competitive mix of revenue-generating mechanisms and a significant capacity to negotiate mining agreements. In 2017, the IGF focused its efforts in Senegal on socioeconomic benefit optimization, mine closure, environmental management and artisanal and small-scale mining (ASM). IGF team lead in Senegal, Alec Crawford, said: "Artisanal and small-scale mining is a significant challenge for Senegal in social, environmental and economic terms. The government is actively trying to address this challenge through a mix of innovative programs like ASM zones, purchasing counters and authorization cards for miners."

It is clear for Senegal that although mining currently contributes to 20% of the country's exports, there is still a lot of untapped potential in the sector. Despite this, the potential for oil and gas exploration in Senegal is a more exciting prospect for now. How Senegal is able to negotiate future deals with the oil & gas sector will be integral to future growth. Well implemented legislation and re-investment into the country's infrastructure will firmly put Senegal on track to continue its steady economic development and encourage further growth of its mining industry. •


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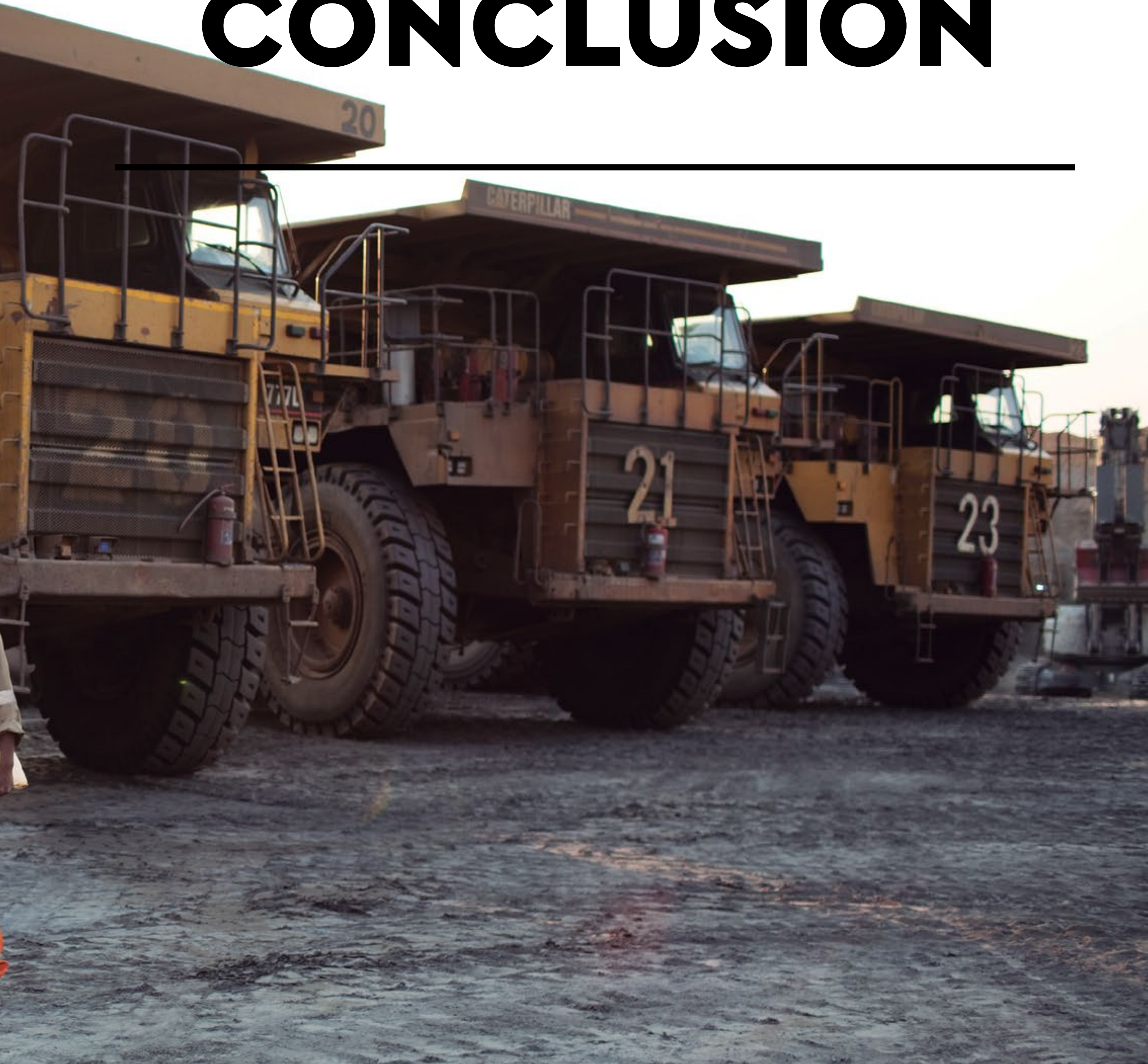
CONCLUSION



"GoviEx realized that Africa provides us with excellent investment opportunities as long as governments demonstrate continued stability. We have observed that governments are becoming more pragmatic than they were previously, and, generally, it appears that the continent is more stable than it has been in a long time."

- Daniel Major, CEO – GoviEx Uranium

Image courtesy of First Quantum

During our research, we speak to business leaders across the value chain to gain a qualitative understanding of the state of the African mining industry based on their experiences. Through what amounts to several hundreds of conversations, we compile a database of valuable knowledge on a range of important topics. In the following pages, please find a brief selection of quotations that we feel best summarize some of the challenges the mining community should expect to encounter going forward, the opportunities to find success, and also thoughts we found to be motivational. Thank you to all of the individuals that took the time to share their insights with us, and we look forward to continuing to learn from you in the years to come.

"Value adding initiatives can only be a positive thing. There are going to be challenges, and not short-term ones. It is going to take us quite a few years to be able to establish a proper industry where we can add value to the volume of minerals we process within Africa. We need to see more public and private partnerships to move this industry forward."

- Qasim Abrahams, Country Manager and VP Sales and Service, Metso Southern Africa

"When you operate in emerging markets, a mine that does not consider its communities as critical stakeholders will not be successful. The social license to operate is not a formal agreement reached with communities like the regulatory license we receive from governments. However, if you do not have the communities behind you and allow them to obtain their rightful share of benefits, they could well make operating that mine very difficult, sometimes impossible."

- Sven Lunsche, VP Corporate Affairs, Gold Fields

"Although it is ultimately a governmental issue to train people in the country so that they fit the needs of companies coming from abroad, we need to work together to see how we can match needs and skills. Even in developed countries, when young people come out of universities they do not typically match with the needs of the markets. Specifically when we talk about the mining sector, large companies need to assist to see how they can bring future employees into projects at an early stage to develop the experience of the young workforce."

- Manya Riche, CEO, Sodeico

"For a long time, companies were looking at the region from a distance, but now due largely to the limited growth rate in developed countries, Africa is of increasing interest because countries are seeing growth levels as high as 4-10%."

- Stanislas de Stabenrath, Managing Director, X&M Suppliers Cote d'Ivoire

"Mining companies are becoming more environmentally conscious. In the early 2000s, their commitment to good environmental practices was primarily driven by the need to comply with the performance standards set by the funders – such as the Equator Principles based on the IFC's Performance Standards. In recent times, mining companies are seeing the benefits of operating in an environmentally responsible way and they are driven by internal and industry-wide norms and standards."

- Vis Reddy, Managing Director,
SRK South Africa

"The key challenge that the mining sector is likely to face in the future is access to finance. This is compounded by the volatility of metal prices. As a result, financiers tend to be relatively averse to funding mining projects. Depending on the sectors underpinning the diversification drive, the lack of requisite local skills and expertise may be a challenge and could heavily influence the cost of doing business in the chosen sector(s)."

- Pius Kasolo, CEO,
ZCCM-IH

"The general public are very critical of the mining industry without actually understanding the positive impacts that can be achieved in many areas. This industry is passionate about what they are doing and they actually understand the obligations of going into developing countries. I was blown away by how connected these CEO's are to the countries where they are working and their focus on wanting to do the right thing."

- Trish O'Reilly, CEO,
Australia-Africa Minerals & Energy Group (AAMEG)

"If you come in with a short-term mindset with an objective of merely making fast money, you might succeed for a short amount of time but you will miss out on the long-term benefits. Ultimately it is all about your connection with the place and people that will assist you in finding long-term success."

- Chetan Chug, Managing Director,
SOMIKA

"There is need for increased partnership between utility players and mining companies to ensure that the electricity networks and energy sources are matched with the energy and power requirements of the mining sector and the two sectors can grow in a mutually beneficial and sustainable manner."

- Owen Silavwe, Managing Director,
Copperbelt Energy Corporation Plc (CEC) Zambia

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Guinea Chamber of Mines, Francoise Mombo, Assistant to the Executive Director
Hotel Almamya, Jehad Esper, Owner

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The Mali Chamber of Mines

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DRC
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Air Fast Congo, Patrick Foppiani, Director General

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