Content

Foreword................................................................................1

Governance, mining, legislation and tax law..........................3

Mineral projects being developed across the Continent..........5

Infrastructure..........................................................................7

Social license to operate.......................................................13

Summary................................................................................14

Contacts................................................................................15

Notes......................................................................................16
Mining companies and governments across Africa are at the sharp end of investor, labour, mining community and media scrutiny. Over the past 12 months, we have seen mining companies seeking to restructure their African interests either through changes in investment intent or through seeking to ring-fence African assets into separate entities to realise more value in those assets of their broader portfolio. Examples are BHP Billiton and Barrick Resources. Some have even listed major impairments (approximately US$500 million) on new projects due to the lack of supporting infrastructure, such as Exxaro’s Mayoko Iron Ore project in the Republic of the Congo.

Of all the mineral opportunities identified across the continent, our research puts the Lufilian Arc (extending from the Zambian copperbelt to the Katanga region in the Democratic Republic of the Congo) firmly in the spotlight as a high-activity region. In this year’s edition of State of Mining in Africa – In the spotlight, we take a further look at, and reflect back on, our observations to see how the broad industry is progressing. We also follow case studies that, in our view, provide good examples that support our previous observations and suggest the potential for a competitive environment between nations in the development of their natural resource assets.
Methodology

This is the second edition of the Deloitte State of Mining in Africa report and is a consolidated point of view of the Deloitte mining leaders across Africa, backed by research in the form of data taken from key business and industry reports. We have taken a snapshot view of several mining regions across Africa and reflect on what is happening through our framework of key success factors for mining investment, which we established in the first edition last year.

We set out that in our experience there are five key factors that set any mining project or operation up for a successful outcome. These are:

• A good mineral deposit
• The deposit being located in an economic region with good governance and consistent application of civil and tax law
• Infrastructure in the form of roads, rail, ports, electricity and communications to support the mine being available and functioning
• A well-understood inbound and outbound supply chain supporting the mine and points to market
• A team of competent and cohesive team members who work together safely.

This framework has been met with strong agreement during presentations at various conferences, media events and – most importantly – during our client interaction on this subject. This year, we suggest the addition of a sixth element to the list, namely:

• Social licence to operate the mine and related infrastructure, and the mining company having a strong track record of maintaining a mutually beneficial operating environment with the community

The sampling basis required infrastructure construction projects to be valued at over US$50 million and to have broken ground, but to not have been commissioned by 1 June 2014. A total of 255 projects qualified for inclusion. Deloitte has also focused on the presentation of robust regional analysis within this edition. Categorisation of regions follows that of the African Development Bank, and data collected was limited to publicly available information.

We value your input and look forward to continuing the conversation around mining in Africa.

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Going straight to the mineral royalty tax table, we inventoried the current rate structures across the selected countries to see whether there is any material movement. Table 1 below displays the mining royalty tax rates over the past six years for our ten sample countries across Africa.

Last year, we noted that out of the ten, Kenya, Zambia and Zimbabwe have increased their tax royalty rates from 2010 to 2014. In the past year, Zambia was the only country to revise mineral royalty rates, thus pushing its rates up on two separate occasions during the past six years. Zimbabwe and Zambia are the only countries in our sample that shifted mineral royalty rates at least twice in the last six years.

Table 1
* 3 For small scale miners
** Of gross sales revenue

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</table>
Considering another angle on legislation, we reflect on ease of doing business ratings. Some countries’ governments have made efforts to improve the ease of doing business rating in an effort to attract investors; however, when looking at the scores, we see a general trend of decline in ratings across the sample set. Mozambique is an exception, climbing 15 points last year. This change can be attributed to government’s focus on speeding up the process for establishing a business (incorporating licensing and work permits) in Mozambique. Reflecting on the Democratic Republic of the Congo (DRC), the ratings have yet to move, thus not benefiting from the new requirements of the Organisation pour l’Harmonisation en Afrique du Droit des Affaires (OHADA) (translation: “the Organisation for the Harmonisation of Business Law in Africa”) implemented in 2014.

The Ease of doing business index ranks economies from 1 to 189, with first place being the best.

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<tr>
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Graph 1 (Source: World Bank Group)
Mineral policy, law and ownership across Africa

A snapshot of mine ownership and mineral policy of a cross-section of mineral-rich countries across the continent shows government mine ownership varies between 5% and 51%. Looking for big changes (with the exception of Zambia’s MRT, change and Zimbabwe’s reforms), it appears there have been minimal shifts in mining law and regulation; and with the exception of the DRC, the prospect of new changes seems to have dampened.

Ghana

It takes five days to register a new company and one month to receive a mining permit. The main legislation governing mining operations is the Minerals and Mining Act 2006 (Act 703). Every mineral in its natural state in, on or under land in Ghana, rivers, streams, watercourses throughout the country, the exclusive economic zone and an area covered by the territorial sea or continental shelf is the property of the Republic, and is vested in trust for the people of Ghana. There are three main types of licences, namely Reconnaissance License, Prospecting License and Mining Lease.

Zambia

In the next two years, Zambia plans in implementing a improved capability for the Mines and Minerals Development Act No. 7 of 2008, Mines and Minerals Development (General Regulations of 2008 and Mines and Minerals Development (Prospecting Mining and Milling of Uranium Ore) and other Radioactive Mineral Ores Regulations 2008. According to the Act, all rights of ownership in, searching for, mining and disposing of, minerals whoseooever located in the Republic are vested in the President on behalf of the Republic.

The main legislation governing mining activities is the Mining Code enacted by Law No. 007/2002 of 11 July 2002. The implementing measures of the Mining Code are provided by the Mining Regulation enacted by Decree No. 038/2003 of 26 March 2003 (the Mining Regulation). This core legislation includes environmental norms applicable to mining activities.

Upon award of an exploitation permit, the holder automatically transfers 5% of the mineral resources to the registered company of the state. The term of the validity is 30 years, which is renewable several times for 15 years.

From 2014, all businesses registered in the DRC adhere to the requirements of OHADA.

In 2015, the government may seek to implement revisions to the mining code and mineral royalty tax.

Kenya

The country’s new mining plans to revolve under the mining bill of 2013, which codifies and replaces the current Mining Act of 1940. There is an express ban to protect local equity shareholding rules with a 10% free carry. The mining secretary through his position as the chairman of the Southern and Eastern Africa Mineral Council (SEAMC) is pushing for reforms that will see East African countries embrace one legal framework and a standard approach to paying out royalties.

Uganda

There is a proposal to review land regulations so as to provide for a quick compulsory acquisition of land for all government projects.

The Ministry of Energy has plans to review the mining law and regulations by this year.

Tanzania

Government has the option of acquiring up to 10% working interest in the mine. This licence is initially valid for a period of up to 25 years.

The government is recognised to continue to pursue policies intended to reduce red tape and increase profitability across the sector as a means of drawing companies into frontier-developed areas of Botswana’s mining sector, including coal, copper and silver.

Botswana

Botswana has reduced company tax from a minimum of 25% to 22%. It continues to be ranked the second-freest economy in the sub-Saharan Africa region, with its overall score is well above the regional and world averages.

Zimbabwe

Zimbabwe’s mining industry is regulated by the Mines and Minerals Act of 1961, Chapter 21:05. According to this Act, the right of ownership to all minerals, mineral oils and natural gases under the land, including the rights to search, mine for and dispose of such minerals, mineral oils and natural gases are vested in the President of Zimbabwe on behalf of the state.

Namibia

Namibia’s mining sector is governed by Article No. 33 of 1992: Minerals (Prospecting and Mining) Act, 1992. Article 100 of the Constitution vests 100 of the Constitution vests the state with the right to search, the right and ownership to minerals (other than common minerals) under or upon any land are vested in the Government. Relevant laws include The Mining Act 2003 and The Mining and Milling of Uranium Ores.

There are three main types of licences that can be granted under the Mining Act. These are: 1. Prospecting licences can be granted to any company or individual. 2. Mining licences can be granted to any company or individual to mine in Tanzania. There are restrictions for gemstone mining for foreigners. 3. Production licences granted to applicant gemmologists and is only for citizens of Tanzania as per section 8(2) of the Mining Act.

There are no restrictions on foreign investment, provided the investor proves there are benefits to the local economy.

The Mineral & Petroleum Resources and Energy

The Mineral Petroleum Resources Development Act, 2013 is currently under review. If passed into law, it could give the Minister of Minerals broad discretionary power to set the levels required for beneficiation, the percentage per commodity and price that is required for beneficiation, as well as the percentage of raw mineral production to be sold to local beneficiators.

On 16 January 2015, South African President Jacob Zuma signed the proposed amendments to the Minerals and Petroleum Resources Development Act (MPRDA), which came as positive news for the country’s mining and oil and gas sectors. However, long-term uncertainty regarding the amendment change remains.

(See: BMI Botswana Mining Report 2014)

South Africa

The Mega Project Law requires the granting of financial and economic benefits to include: /m/096b5

Mozambique

There must be between 5% and 20% local shareholding in every major acquisition or big mining project.

Concessions are granted for periods equivalent to the economic life of the mine up to 25 years, renewable up to a further 25 years.

The Mining Code defines the new mining rights of the government. The Government has the option of acquiring up to 10% working interest in the mine. This licence is initially valid for a period of up to 25 years.

Government has the option of acquiring up to 10% working interest in the mine. This licence is initially valid for a period of up to 25 years.

The government is recognised to continue to pursue policies intended to reduce red tape and increase profitability across the sector as a means of drawing companies into frontier-developed areas of Botswana’s mining sector, including coal, copper and silver.

(See: BMI Botswana Mining Report 2014)
Mineral projects being developed across the continent

Turning back to our framework, we took a step back to get a feel for project development across the continent. Firstly, it is important to note that, according to SNL, exploration activity is down once again across Africa, which is consistent with the general global trend. Non-ferrous exploration spend for 2014 is estimated to be approximately US$1.7 billion across the continent (see Graph 2). This is down approximately 28% from 2013 and down 50% from the peak spending year of 2012. Applying the 80/20 rule for 2014, we identify 14 countries that make up over 80% of the exploration spend across the continent (see Graph 3). These countries have generally maintained the top position in spend over the past three years. However, it is clear that the DRC has been taking “market share” from other countries by maintaining a + US$300 million exploration spend for the third year running (see Graph 4).

Approximately 30 projects are expected to come on line from 2015 to 2018. New mining projects coming into full production by the end of 2018 across various commodities include:

- Nine copper mines
- Four gold mines
- Four diamond mines
- Three coal mines
- Three platinum mines
- Two uranium mines
- One iron ore mine
- One nickel mine
- One zinc mine
- One potash mine

These new mines make up a total of US$18 billion in investment across the continent. We estimate the total forward spend on these projects from 2015 to 2018 to be approximately US$10.5 billion, with South Africa taking 29%, DRC 23%, Mauritania 8%, Namibia 8%, Zimbabwe 8% and Zambia 7%.
These new mines make up a total of US$18 billion in investment across the continent. We estimate the total forward spend on these projects from 2015 to 2018 to be approximately US$10.5 billion, with South Africa taking 29%, DRC 23%, Mauritania 8%, Namibia 8%, Zimbabwe 8% and Zambia 7%.

Looking at Copper as the largest group, we test out the hypothesis that regardless of perceived country risk and a stable legislative environment, a good deposit will make up for these things. Below, we map out the nine copper projects by year to be delivered, output and head grade, providing the average head grade for Chilean copper operations for further scale. A few further observations are:

- The majority of the copper development is occurring along the DRC/Zambian copperbelt.
- The DRC is delivering the most projects going forward. Their head grades stand out as clearly higher than the rest.
- With an ease-of-doing-business value of 184 in 2014, the DRC is perceived to be a country in which it is more difficult to do business than is the case in Zambia, coming in at 111.
- The 2014 exploration spend in the DRC is almost triple that of Zambia across all commodities, and the spend in copper exploration is double, with Zambia taking just over an estimated US$100 million and the DRC at just over US$200 million.
- Considering the currently known forward investment and project pipeline, the DRC is expected to maintain its production lead over Zambia into 2020. Should Lumwana close as planned, the DRC will maintain a clear and decisive lead in copper production over Zambia.
Generally, the mining sector and governments agree infrastructure development is critical for the growth of the mining sector in Africa. Well-maintained and appropriately sized capacity in rail, ports, power, roads and communications leads to more economic reliability, and maintenance of lower costs for mining operations. Our observations this year for infrastructure confirm our assertion from last year, which is that the infrastructure build is underway, but it will really only fully reach a level of maturity in the next three to four years. The need for the infrastructure is real, and development is lagging demand. This is best exemplified by the currently stated strategy and timing for power infrastructure development and revitalised maintenance by South African State Utility Eskom (see case study).

As a reminder, Graph 2 below shows the total number of infrastructure and mining projects from 2003 to 2030 across the continent. As access to reliable energy is a precursor for growth of any economy, it is clear that this is where the focus is for Africa. For the period from 2003 to 2030, we estimate that over US$317.5 billion is scheduled to be spent into energy and power projects, followed by rail, ports, roads, mining and water. An estimated US$50 billion will be invested into mining projects over the same period. This does not include Rio Tinto’s Simandou project at US$20 billion, which will drive the figure to US$70 billion. Focusing on the next three years, we estimate approximately US$18 billion in mining projects will be coming on line into full production.
Eskom case study – South Africa’s current situation around power supply

The mining sector consumes around 15% of Eskom’s power output. Due to delays in building new power plants, South Africa experienced Level 3 load shedding towards the end of 2014 and early 2015. This level of load shedding last took place during the global economic crisis in 2008. Eskom currently exports electricity to Botswana, Mozambique, Namibia, Zimbabwe, Lesotho, Swaziland and Zambia.

In response to the energy crisis, Eskom has developed a five-point plan, which is a short-term and medium-term (next 30 days, as well the next three years) intervention to normalise electricity supply to the grid for the next three years and to limit the risk of load shedding. The five areas are:

- Eskom emergency measures – next 30 days
- Co-generation
- Gas imports
- Coal independent power producers (IPPs)
- Demand-side management

Lack of power supply is important for mining companies that are looking to develop new operations or to continue current operations across the continent. With electricity costs making up between 15% and 40% of the overall cost of a mining and processing operation, negative fluctuations in this area have a serious impact on the bottom-line of the investment. We expect to see more mining companies partnering with IPPs or generating their own mouth-of-mine power supply to secure future power supply.
Drawing a comparison between the two countries

**DRC**

- **US $2.5 billion**
  - Total estimated forward committed project investment to 2018
- **2.7%**
  - Average head grade for surface ops
- **2**
  - Number of Mineral Royalty Tax changes in past 6 years
- **184**
  - Ease of doing business rating
- **0**
  - Number of mines executing shut-down plans

**Zambia**

- **US $0.3 billion**
  - Total estimated forward committed project investment to 2018
- **0.7%**
  - Average head grade for surface ops
- **111**
  - Number of Mineral Royalty Tax changes in past 6 years
- **1**
  - Ease of doing business rating
- **1**
  - Number of mines executing shut-down plans

**Exploration investment 2014**

- **US $306 million**
- **US $120 million**

**Total estimated forward committed project investment to 2018**

- **US $2.5 billion**
- **US $0.3 billion**

**Average head grade for surface ops**

- **2.7%**
- **0.7%**

**Number of Mineral Royalty Tax changes in past 6 years**

- **2**
- **111**

**Ease of doing business rating**

- **184**
- **1**

**Number of mines executing shut-down plans**

- **0**
- **1**
Reflecting on this information, we make two suggestions:

- Projects with clearly impressive head grades will succeed over ones with lesser quality, even in environments that may be perceived to be extremely difficult.
- The DRC and Zambia could be in a race to develop their natural resources. It appears the DRC is winning that race in terms of exploration investment, future mine development project pipeline and total copper production.

Given that Zambia has head grades that are clearly lower than that of the DRC, is Zambia being disadvantaged further by the fact that it has changed its mineral royalty tax twice in the past six years? The DRC demonstrates that investors are willing to accept other perceived risks if grade is good enough and regulation remains stable.

**Who is funding the projects?**

In our last edition, we committed to look at the sources of the investment capital across the continent. Below, we outline the sources of funds of the 29 mining projects currently in development across the continent. The Toronto Stock Exchange is funding 28% of projects, followed by Hong Kong stock exchange funding 17% and the National Stock Exchange of India funding 10% of these projects.

**Funding of mining projects across Africa**

[Graph 9 (Source: SNL)]
Taking the press as a test environment for vetting of public concern over the development of mining projects and the reporting of legal battles around mine development in Africa, we researched twelve projects across our sample countries and found that only two had been stopped due to the absence of a social licence to operate.

We found that material community issues did occur during normal operations. This does typically impact on costs.

It is our experience most all mining companies work very hard at developing productive community relationships. Given material community issues seem more likely to spring up during steady state operations, is there more that can be done during development to prevent these occurrences?
Summary

The continent is certainly slowing in future mineral development. Considering the current prices of many commodities, the outlook for growth looks very gloomy indeed.

When looking at the mineral projects being developed across the continent, we observe that mineral exploration investment is down approximately 50%, compared to 2012. Exploration spend across Africa is at an estimated US$1.7 billion for 2014; however, the DRC continues to gain exploration spend “market share”. The majority of projects across Africa are being funded by Canada-listed companies, with four of the 10 projects being in the DRC.

Despite the DRC being perceived as a difficult country to do business in, this region has seen more mineral exploration activity over the past three years than anywhere else in Africa. It is clear to us that the quality of the ore body strongly influences investment decisions, with higher-grade deposits being pursued. It seems that by changing tax royalty rates, Zambia stands to remain behind in our suggested competition for investment. Will other countries look to the copper-rich Lufilian Arc, shared by the DRC and Zambia, for lessons learnt when considering altering their tax and legislative frameworks?

Governance, mining legislation and tax law seem to be broadly stabilising, with the exception of Zambia and Zimbabwe, which increased their tax royalty rates twice in the past six years. It appears that governments are making a general effort to sustain mineral policy, law and ownership laws across Africa.

Infrastructure build is broadly on track but is not meeting the demand of projects.

There are very few incidents of communities stopping mine and plant project development; however, the social licence to operate really becomes a factor further down the mining value chain when the mine is in production, requiring mining companies to continue with holistic and meaningful strategies within the regions they operate.
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Below is a list of resources used to research this thought leadership:

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http://www.snl.com/
http://www.voazimbabwe.com/content/zimbabwe-diamonds-chiyadzwa-ngos-villagers-audit-mining/1873000.html
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