FTI CONSULTING™

MINING SUSTAINABILITY IN SOUTH AFRICA

AN **FTI CONSULTING REPORT**

EXPERTS WITH IMPACT™

FTI Consulting Report // Published Jan 2020

TABLE OF CONTENTS

INTRODUCTION

This article gives an overview of the pivotal role of South Africa in the global mining industry and how mining has supported South Africa's industrial development by contributing to growth, investment, employment and foreign exchange.

In recent years, the South African mining industry has been in the doldrums and this has led commentators to ask whether the industry is now in a stage of 'Sunrise or Sunset'?

We provide a framework for future sustainability for the industry. This framework sets out questions and possible responses on growth, costs, risks, capabilities and license to operate.

SOUTH AFRICA'S PIVOTAL ROLE IN GLOBAL MINING

RESERVES AND PRODUCTION

South Africa is a leader and a pivotal player in the world's mining sector, attracting both international and South African investors and mining companies. The country has a mineral reserve valued at **US$2.5 trillion** and estimated to have the world's fifth largest mining sector in terms of GDP value.

The country is endowed with significant wealth such as:

95% of world's platinum reserve

The world's largest reserves of Platinum Group Metals (PGM)

WORLD'S LARGEST reserves for three minerals

Chromium, gold and manganese

7% of world's coal reserve

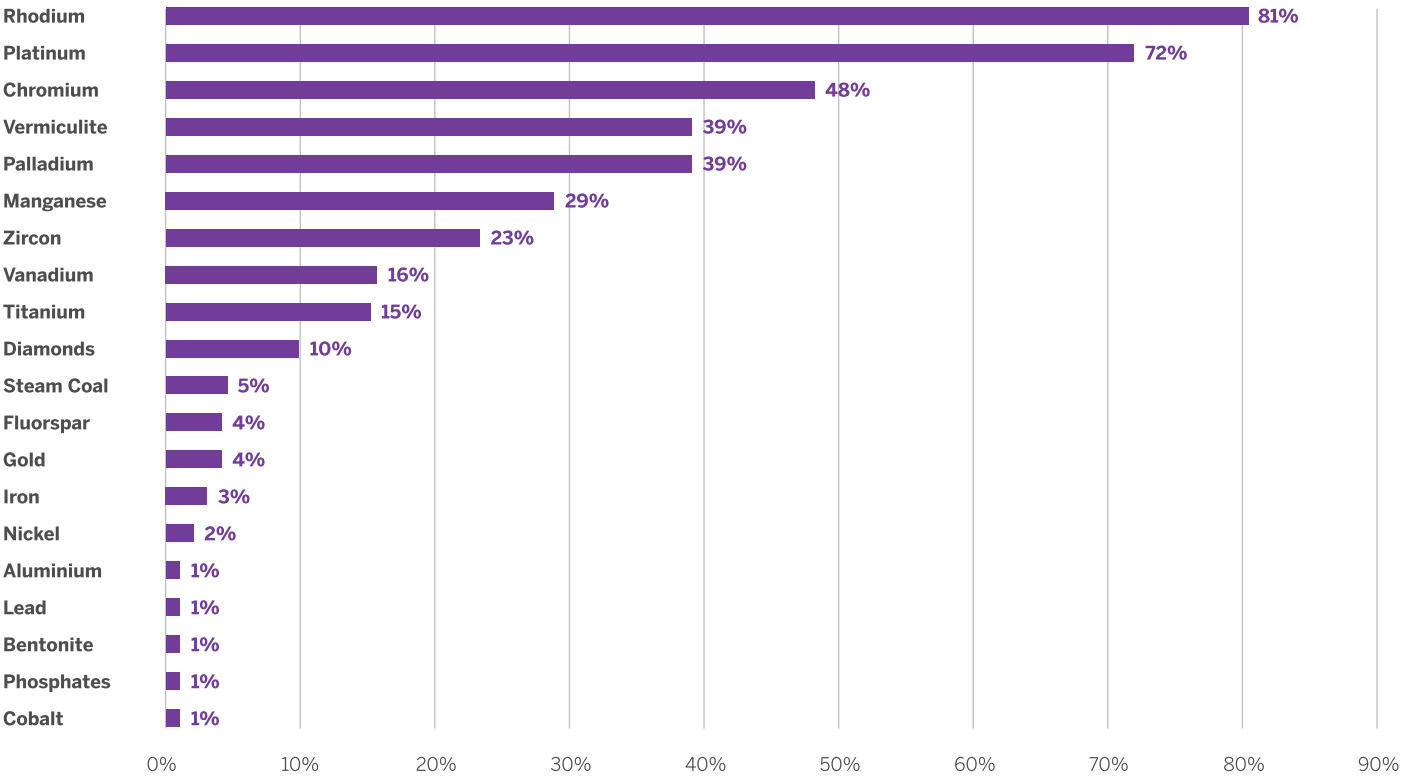
Making South Africa the fourth largest exporting country in the world

10% of world's diamonds reserve

10% of the world's diamonds

Reserves are mainly in the north east of the country covering multiple provinces such as Limpopo, Mpumalanga, Gauteng, North West Provinces and Free State. The country's mining industry is a world leader in many respects – producing literal ground-breaking technical advancements as well as world-class mineral research and development.

FIGURE 1 : South African production as a percentage of global production



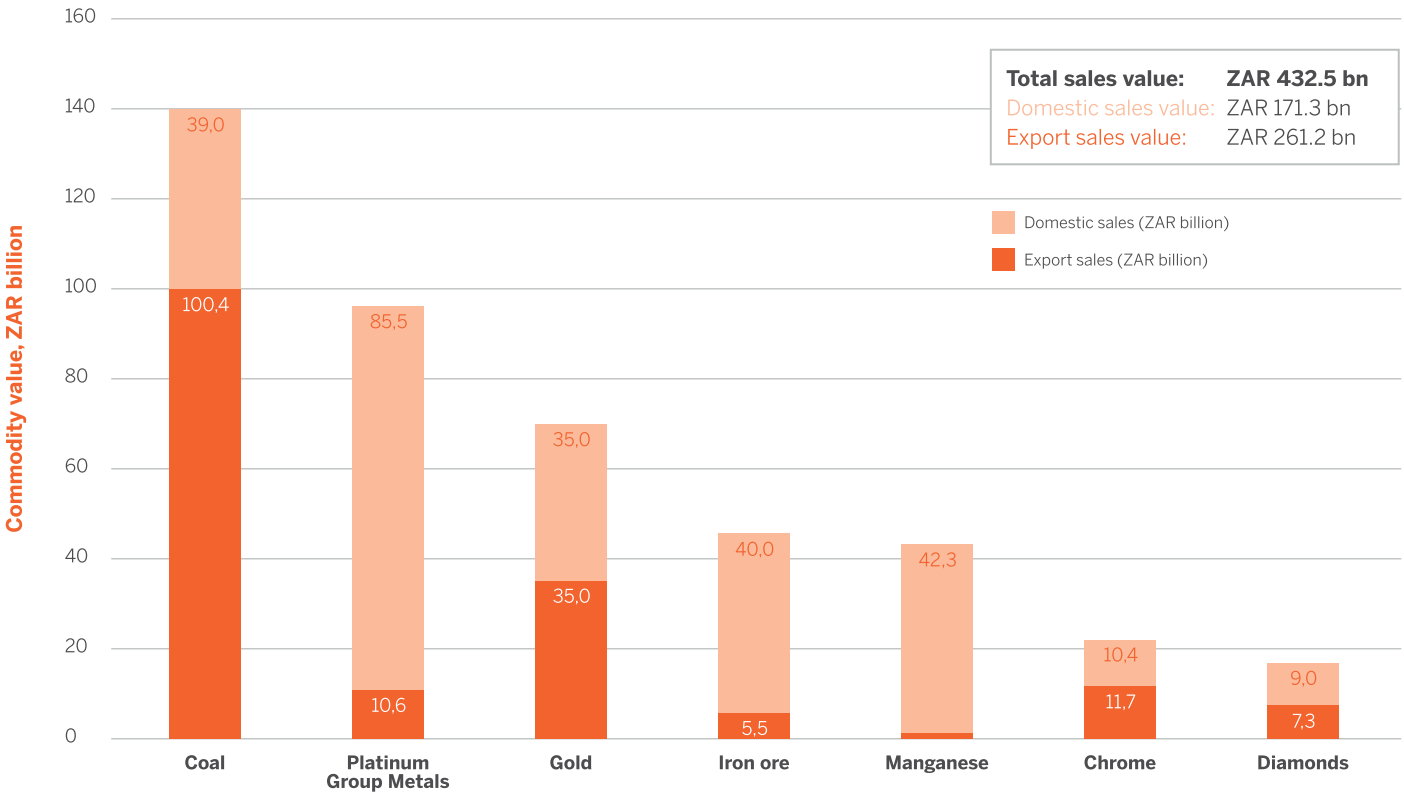
Source : World Ming Data, FTI Consulting analysis

SOUTH AFRICA'S PIVOTAL ROLE IN GLOBAL MINING

MULTIPLE COMMODITIES FOR DOMESTIC AND EXPORT MARKETS

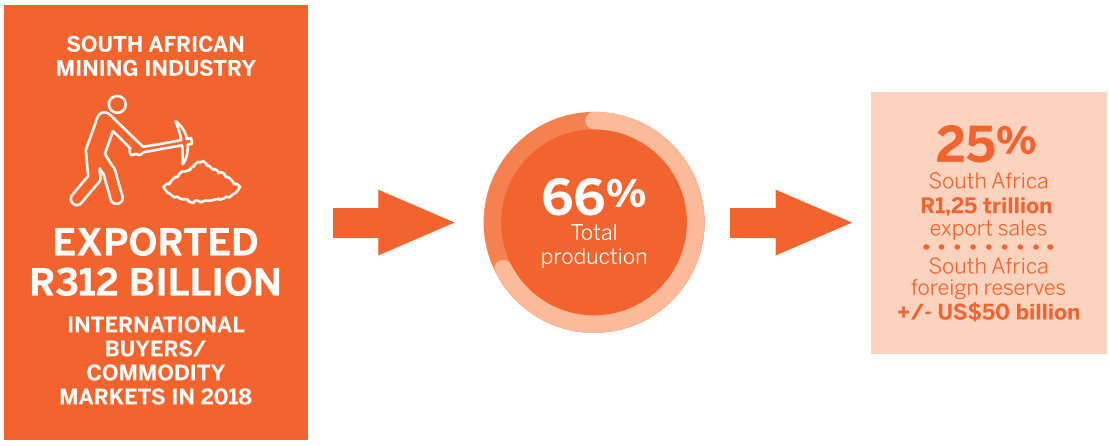
South Africa produces several commodities such as including such as coal, platinum group metals, gold and iron ore. The total sales value of commodities was **R432.5 billion** in 2018.

FIGURE 2 : South African commodity sales



Source : Minerals Council South Africa 2018, FTI Consulting analysis

In total, the South African mining industry exported **R312 billion** worth of commodities to international buyers or commodity markets in 2018, 66% of its total production. This was 25% of the country's **R1.25 trillion** export sales, equal to half of the country's foreign reserves **(+/- US$50 billion)**.



MINING'S SUPPORT TO SOUTH AFRICA'S ECONOMIC DEVELOPMENT

LONG HISTORY

As a country blessed with rich mineral wealth, mining is a fulcrum industry for South Africa. The long historical association with mining goes back to the 1800s.

Commercial coal mining began in the Eastern Cape in 1852 and continued to expand over the next 50 years, fuelling growing industry in the country. Coal mining was particularly significant for South Africa because in the absence of oil reserves it became a cheap source of energy for the country, with **90%** of electricity today still fuelled by coal-fired power plants.

29
Cu
Copper
63,546

Copper mining began in the Northern Cape in 1852. Diamond mining became a major contributor to the economy in the second half of the 1800s, with the famous Big Hole diamond mine created in 1871 which would yield 2,720kg of diamonds and establish the De Beers mining company.

79
Au
Gold
196,967

Large gold deposits in the Witwatersrand area led to Johannesburg becoming the world's largest city that is not on a major body of water, developing rapidly as a result of the local mining industry.

78
Pt
Platinum
195,085

Following the First World War, South Africa's first platinum deposits were discovered in 1924, with mines adjacent to where this first deposit was found accounting for over **75%** of global platinum production since commercial operations began.

Mining's contribution to the economy and industrialization of South Africa continued to grow throughout the 1900s as uses for mining products grew, increasing the number of jobs the sector created and its contribution to trade and foreign reserves.

ECONOMIC CONTRIBUTION

At its peak in 1980, mining contributed some **21%** to the country's GDP. In 2018, the sector contributed **R351 billion** to South African GDP, representing **7.3%** of total GDP. The sector is also currently growing at a faster rate than the overall economy, although this is partly attributed to current commodities prices.

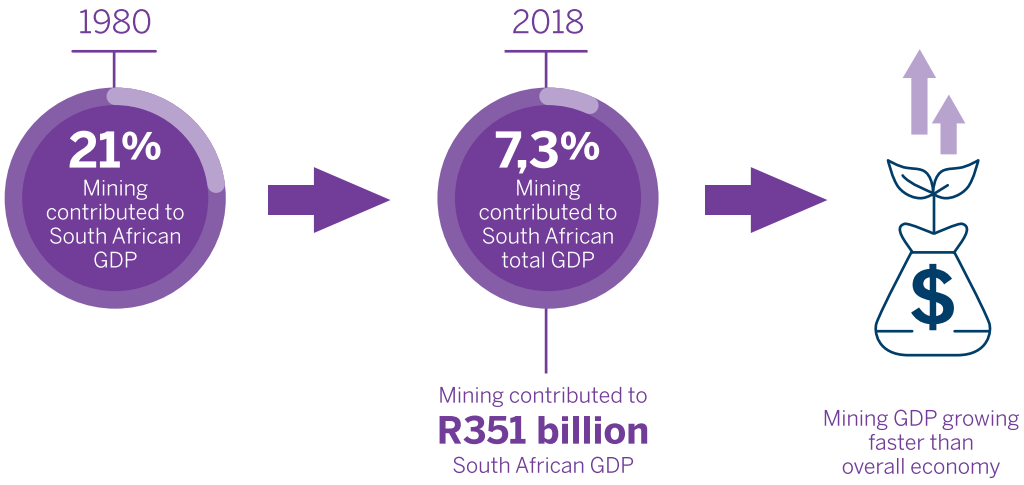
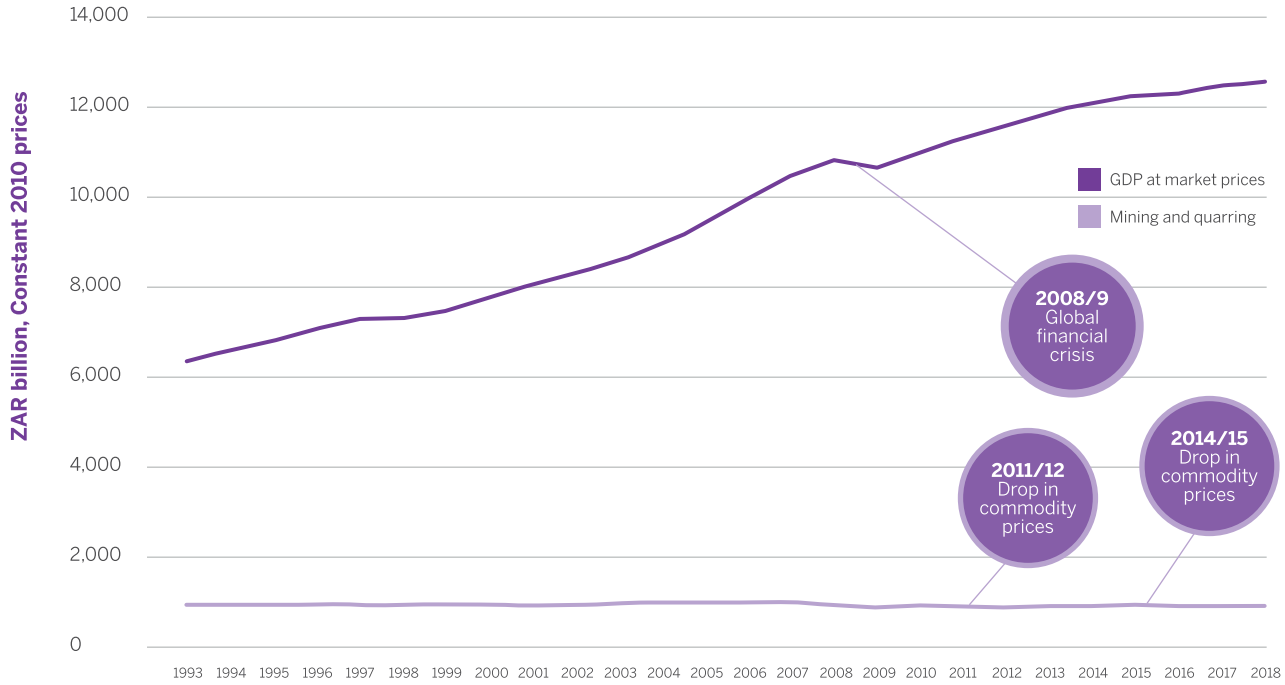


FIGURE 3 : South Africa GDP and contribution of mining to GDP, 1993 - 2018



Source : Statistics South Africa, FTI Consulting analysis

MINING'S SUPPORT TO SOUTH AFRICA'S ECONOMIC DEVELOPMENT

Mining provides jobs for around **465,000** people directly, which is **4%** of South Africa's workforce. The industry spends **R126 billion** per year on employment people. The mining workforce then support many dependents.

The mining is a major attractor of foreign investment in the country. Investment has flowed from both South African and international sources. In 2018, the industry contributed **R93 billion** to fixed investment, which made up **17%** of private sector fixed investment and **10.5%** of the South Africa's total fixed investment spending for the year.

FIGURE 4 : Contributions snapshot

GDP

- South Africa has the world's fifth-largest mining sector in terms of GDP value
- Mining contributed **R351 billion** to the South African GDP in 2018
- Mining represents **7.3%** of South African GDP in 2018

EMPLOYMENT

- Mining employs **4%** of South African non-agricultural workforce
- **456,000** people directly employed in in 2018
- **R134 billion** in total earned by employees per year in 2018
- Supports **1.3 million** indirect jobs in 2018

INVESTMENT

- The mining sector has attracted valuable foreign direct investment to South Africa
- Mining contributed **R91.1 billion** to fixed investment in 2018

VALUE

Mining accounts for one-third of the market capitalisation of the JSE

RESERVES

- South Africa's total mineral reserves have an estimated worth of **US$2.5 trillion**
- **95%** of the world's platinum reserves
- **7%** of the world's coal reserves
- Largest reserves in world for chromium, gold and manganese

POWER GENERATION

Coal accounts for **86%** of South Africa's electricity production.

ASSETS

South Africa boasts the world's five deepest mines – the two deepest are both owned by AngloGold Ashanti, the TauTone gold mine at some 3.9km deep and the Mponeng gold mine some 3.84km deep as at the end of 2018.

Source : : Minerals Council South Africa; StatsSA; South Africa Department of Energy; Statista

A FRAMEWORK FOR FUTURE SUSTAINABILITY IN MINING

In recent years, the South African mining industry has had a declining contribution to GDP, which has led commentators to ask whether the industry is now in a 'Sunrise or Sunset' stage?

This is on the back of declining production, lagging cost competitiveness, low levels of exploration spend, labour unrest, policy uncertainty and reputation scepticism with regards to the industry's readiness for a greener world. We provide a framework for future sustainability for the industry. This framework sets out questions, trends and possible responses on growth, costs, risks, capabilities and licence to operate.

FIGURE 4 : Framework for future sustainability

	QUESTION	MAJOR GLOBAL AND LOCAL TRENDS	POSSIBLE RESPONSES
1 / GROWTH	How do we grow?	Changing demand patterns (e.g. Asia) Urbanisation and rising living standards Diverse commodity price cycles Transition to cleaner energy Rand depreciation	Consumer led in targeted markets Diversified portfolio Sales uplifts via trading and marketing Balance domestic and export markets
2 / COSTS	How do we become globally cost competitive for every asset?	Higher cost mines – deeper, frontier Falling ore grades Labour cost rises Electricity price hikes Water price rises	Mine automation Cost driver management (labour, chemicals, machinery & equipment, electricity and diesel, transportation and storage
3 / RISKS	What risks do we anticipate and manage?	Electricity security of supply Water security Corruption Policy uncertainty	Electricity self generation Energy and water efficiency Ethics and governance Policy advocacy
4 / CAPABILITIES	What are the differentiated capabilities we should build?	Rebalancing of production and exploration assets Technology advances Shift from low to high skilled labour	Amplification of: Exploration Technology Consumer and market intelligence Strategy and partnerships
5 / LICENSE TO OPERATE	What makes our licence to operate compelling with our stakeholders?	Mining on the back foot on reputation Increased environmental emphasis Investor expectations and activism Unemployment and inequality underpinning community expectations	Standardised Environment, Social and Governance (ESG) reporting Stakeholder communications and impact Decarbonise the supply chain

The framework covers numerous trends and possible responses and we cover just some aspects here.

A FRAMEWORK FOR FUTURE SUSTAINABILITY IN MINING

GROWTH

Growth depends upon building and managing an asset portfolio which is favourably positioned over time for changing demand patterns and commodity price cycles. Major decisions such as allocating capital and acquisitions are taken with a long-term view of at least **10-15 years**.

Anticipating changing demand patterns is complex, whether the asset portfolio is diversified or focused on commodities. A single trend can simultaneously increase demand for some commodities and reduce demand for others.

For example, despite the energy transition to lower emission sources, world coal demand is still expected to grow, with some countries reducing their demand for coal and others increasing. In Asia (e.g. China, India) and Russia, the demand for coal is expected to continue with economic growth in the short term, whereas other areas such as the US and Europe are closing coal-based power plants and switching to alternative and cleaner sources. South Africa has pivoted from exporting to Europe towards Asian off-takers such as China, India and Japan. However, although short term demand growth in China is expected, it is also rebalancing its economy towards more on services and less on industrialisation and will rely less on coal in the long -term.

The global population is rising, and standards of living are expected to rise. A population of over **10 billion** is expected by 2070. The world is increasingly, and rapidly urbanising, and rising living standards are expected to lead to people to consume more, driving mineral and metals demand for decades to come. This will have an impact on the demand for Platinum Group Metals (PGMs) for example. Platinum has several applications in the automotive, industrial, jewellery and investment demand segments, and higher wealth could translate into greater demand for consumer electronics which require PGM components. Energy is transitioning to lower emission systems with the cost of alternative energies falling. The effect of this will simultaneously reduce the demand for coal power generation in industrialised nations and increase demand for platinum for catalytic converters for ICE vehicles and for battery components in electric vehicles. Platinum based fuel cells will also become more significant as the hydrogen economy evolves.

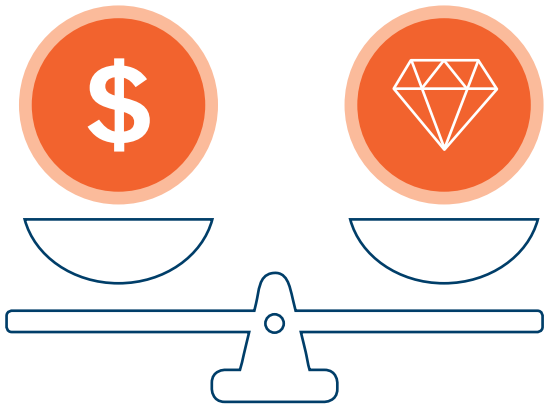
Another consideration is the diverse and cyclical nature of commodity prices, particularly when exporting to overseas markets. South Africa exports significant amounts of its mining products (particularly high value metals) and the volatility of the rand coupled with these pricing fluctuations means that the dollar value and economic contribution of these exports can vary even from month to month. Balancing the portfolio between domestic consumption and export markets is therefore another important consideration.

COSTS

Mining is a global industry, therefore in country assets need to be globally cost competitive and have production cost curves higher than commodity spot prices to be sustainable.

According to global cost benchmarks, some South African assets are top quartile and others are bottom quartile. After a period of sustained cost cutting across the mining industry, there is still a place for continuous monitoring of costs. In South Africa, cost pressures are particularly challenging in the areas of rising wage costs (without corresponding rises in productivity) and electricity costs. Relations and negotiations with labour unions and new models for electricity supply will be important for future cost containment.

Mining companies are increasingly modernising and adopting new ways of working through automation technology. Mines are adopting process and software automation to carry out tasks ranging from extracting ore, robotic loading of haul trucks and driverless trucks and trains. Those which have adopted mine automation are experiencing higher efficiencies, lower costs and better safety outcomes. However, it also reduces the need for employment in the communities in which they operate, a key consideration for operations in the South African economic context.

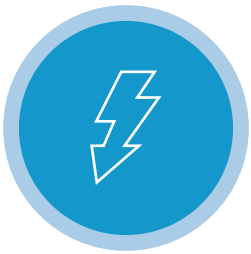


RISKS:

ELECTRICITY

Mining is one of the most energy intensive industries in the world, making access to reliable and affordable electricity an important ingredient for success.

In South Africa, security of electricity supply is unreliable, and the cost of electricity continues to escalate. As recently as December 2019, Eskom implemented **'Stage 6'** load shedding across the country. This included requesting mining companies to conserve power and disrupt operations, temporarily reducing or shutting down their underground operations.



The ability for the mining industry to fully resolve this is constrained by supply reliance on Eskom and regulatory limitations on the ability to self-generate.

The first barrier to reliable electricity supply is Eskom. South African businesses and households are highly dependent on electricity produced by Eskom as the monopoly utility provider. Eskom is unlikely to become a reliable provider in the near future given problems faced with debt, falling revenue, rising costs and ageing power plants and infrastructure.

The second barrier for the mining industry are difficulties in gaining permission to self-generate electricity. Distributed electricity generation facilities below 1 MW require registration, then municipal or Eskom consent if they are to be connected to the grid. Facilities from 1-10 MW require approval from NERSA, while anything above 10 MW currently requires exemptions and approval from the Department of Mineral Resources and Energy.

The approval process is long, and there is a lack of progress in successful approvals. In early January 2020, the business community has called for no limits on self-generation and described the Eskom situation as being "the death of mining in the country". In response, President Cyril Ramaphosa has given the government the direction to work on legislation that will allow companies and households to generate their own electricity in order to alleviate the burden of government licences and approvals. This marks potential progress that self-generation – especially of renewable energy – is gaining support.

> " THE DEATH OF MINING IN THE COUNTRY'

A FRAMEWORK FOR FUTURE SUSTAINABILITY IN MINING

CORRUPTION

Across the world, extractive industries are in the spotlight and perceived as high potential areas for corrupt activity given the scale of revenues, spend involved and cross-border interactions.

In addition, South Africa has been marred by in 'State Capture' revelations and accusations. The risk of actual or perceived corruption continues for the industry. The corruption risk requires a comprehensive response given that it can occur at any point along the mining value chain e.g. approval of mining rights to operational permits, allocating contracts to suppliers, ongoing operating spend to jobs secured by patronage. The occurrence of illegal mining practices are extremely hazardous to individuals, communities and the environment and the negative impacts of corruption are many as they are severe.

Corruption limits sustainable growth, generates conflicts of interests and can snowball quickly in a vulnerable culture, with accusations leading to community revolt and litigation suits. Applying a comprehensive approach to the prevention and response to corruption is a necessary capability. Having robust mechanism for whistleblowing, investigations, intelligence gathering, and screening helps decision makers to address risk, protect reputation and assets, remediate compliance and make informed decisions.

WATER

Water security and quality is likely to become an increasing risk for mining in South Africa.

Mining is not the most water intensive industry in the country, but it does play an important role in the mining process. Depending on the type of mining and mineral processing, water is used in the conveyance of the ore or waste (e.g. tailings disposal), mineral processing and separation, cooling, dust suppression and washing of equipment. Over the next two decades, it is predicted that climate change will worsen South Africa's water security. Average temperatures are expected to rise, and droughts are expected to become more severe and common. South Africa is semiarid and characterised by low rainfall and water infrastructure is ageing. A shortfall in water supply is predicted in the future and each region in South Africa is different, with their own unique water demand and supply balances. Regional imbalances have been addressed by water transfers from neighbouring countries and between regions.

The mining industry's reputation is likely to become increasingly tied to their consumption, productivity and pollution of water going forward. Finding ways to reduce water consumption and improve productivity (e.g. recycling) and prevention of water quality pollution will be important sustainability initiatives. Managing water more effectively could also reduce the high costs of wastage.

CAPABILITIES

Choosing which capabilities to invest in will be a source of competitive advantage. Having strong managerial, technical and commercial capabilities will always be needed. There are some capabilities which are likely to become increasingly important in the future.

EXPLORATION: The drop in commodity prices in 2015 prompted mining companies to restructure and reign in capital spend and greenfield projects in particular. The industry trod carefully and tended to grow reserves through acquisition of existing and producing assets, instead of via greenfield projects. With many of the world's large commodity deposits already known, priced and owned, future growth will likely depend increasingly on the level of exploration capability and expertise.

TECHNOLOGY: The mining industry is on a path of innovation which can bring greater automation and positive impacts on operational efficiency, output, costs, and safety. Across the world, mining is increasingly designing and deploying Artificial Intelligence (AI), autonomous technology and robotics. There are many examples of this - sensors being used on mining buckets which provide compositional information and flying drones for geological surveys. The use of next generation technology will require mining companies to build a workforce who are technologically adept.

CONSUMER INSIGHTS AND TRADING: The complexity of commodity price and currency fluctuation in a globalised industry over short- and longer-term time frames can sway margin and cash flows for the industry. Mining companies may consider entering the commodities trading market in order to sell more than they produce. This would require the building of market intelligence and trading capabilities. Furthermore, consumer demands are changing and how products are made are changing. Developing capabilities in the analysis and understanding of customers would enable companies to anticipate and respond to metal and minerals markets.

STRATEGIC PARTNERSHIPS AND STAKEHOLDERS: High levels of collaboration will be needed with government, suppliers, customers and communities. Capabilities of being able to form long lasting partnerships and business models and the ability to negotiate, advocate and form bonds will become an increasingly important skill set

> " THE MINING INDUSTRY IS ON A **PATH OF INNOVATION** WHICH CAN BRING GREATER AUTOMATION AND POSITIVE IMPACTS ON OPERATIONAL EFFICIENCY, OUTPUT, COSTS, AND SAFETY."

A FRAMEWORK FOR FUTURE SUSTAINABILITY IN MINING

LICENCE TO OPERATE

Over the last decade, global institutional investors have begun increasingly prioritising environmental, social and corporate governance (ESG) in their decisions. ESG now plays an important role in influencing capital allocation, share price movements and the composition of boards of the companies they are invested in.

Few South African mining companies stand out as leaders in ESG performance. Whilst pressure from regulators, investors and stakeholders may drive a direction of change, real changes to a company's business model and its approach to sustainability can only come from within.

Mining is on the back foot of reputation management despite having one of the highest rates of sustainability reporting of any industry. The negative perception that pervades the mining industry impacts the industry's attractiveness to investors, potential and existing employees, and host governments and increases the cost of capital. A higher level of communication and transparency may enable mining companies to better communicate the in-country benefits that their operations bring - the launch of the 2019 Extractive Industries Transparency Initiative Standard - which covers new requirements on contract transparency, the environment, and gender - may help to improve transparency on the real benefits brought about by mining companies, as countries implementing the standard will be required to disclose information on how much extractive companies pay in taxes, royalties, and other "social payments," as well as how the host government is utilizing these payments.

The climate change conversation is heightening, and mining companies are often incorrectly labelled as the main contributors to environmental issues. Mining companies need to communicate more effectively about the positive impacts their products (such as steel for the construction of wind turbines or metals for the production of battery cells) may bring to global climate change efforts; as well as to expand on the changes being brought in at operational level to improve on energy consumption and lower carbon emissions.

South Africa suffers from issues of poverty, unemployment and income inequality. Access to basic services, housing, electricity and running water are out of reach for a majority of the population - and this is particularly prevalent in rural areas. Mining companies are frequently seen as the panacea to rural poverty and as a result communities have heightened expectations of jobs, access to health services and education. Against this backdrop, securing the social licence to operate is becoming increasingly imperative in South Africa.

ABOUT FTI

EXPERTS WITH IMPACT

FTI Consulting is an independent global business advisory firm dedicated to helping organisations manage change, mitigate risk and resolve disputes: financial, legal, operational, political & regulatory, reputational and transactional.

FTI Consulting professionals, located in all major business centres throughout the world, work closely with clients to anticipate, illuminate and overcome complex business challenges and opportunities. For more information, visit www.fticonsulting.com

AUTHORS

Claire Lawrie
Senior Managing Director
Johannesburg
Email: Claire.Lawrie@fticonsulting.com

Sherryn Schooling
Senior Director
Cape Town
Email: sherryn.schooling@fticonsulting.com

Johan van der Walt
Senior Managing Director
Johannesburg
Email: johan.vanderwalt@fticonsulting.com

Laura Menzies
Senior Consultant
Johannesburg
Email: Laura.Menzies@fticonsulting.com

FTI CONSULTING CONTACT

Michelle Deavall
Africa Marketing Manager
Johannesburg
Email: Michelle.Deavall@fticonsulting.com

FTI Consulting South Africa

Cape Town
8th Floor
125 Buitengracht Street
Cape Town
8001
South Africa
Tel: +27 21 487 9000
Fax: +27 21 426 0582
Website: www.fticonsulting.com

Johannesburg
WeWork Link
Ground Floor
173 Oxford Road
Rosebank
Johannesburg
2196
South Africa
Tel: +27 11 214 2400
Website:www.fticonsulting.com

Stellenbosch
76 Dorp Street
Stellenbosch
7600
South Africa
Tel: +27 21 887 5678
Website: www.fticonsulting.com