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STEERING MINING INTO THE FUTURE:
CAN THE MINING INDUSTRY PREPARE ITSELF FOR A REINVIGORATED TOMORROW?

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The country's foundations

> 'South African mining is a story both of triumph and tragedy. Long the bedrock of South Africa's economy, mining is an industry whose future role – indeed, its future existence – is in deep doubt. On the face of it, this is counterintuitive. South Africa has an extraordinary mineral endowment, estimated at around US$2.5 trillion. Mining contributes about 8% of South Africa's GDP, 5% of the country's employment, and roughly a third of its exports. The country's mining industry has over the years made an impressive contribution to the global commodities market and the development of mining technology.' Terence Corrigan, Institute of Race Relations[1]

From its origins in the discovery of diamonds and gold from the 1870s, for the next 100 years, mining would be the backbone of the economy in South Africa, consistently the largest contributor to the country's export earnings and gross domestic product, peaking in 1980 at 21% of GDP. It was also a major contributor to employment, reaching 760 000 jobs, its highest level, in 1987. Moreover, it was the foundation of South Africa's industrialisation, and today contributes enormously to value chains, as a consumer of goods and services and a prompt to innovation.

> *From its origins in the 1870s, mining would be the backbone of the economy in South Africa, consistently the largest contributor to the country's export earnings and gross domestic product, peaking in 1980 at 21% of GDP.*

Yet there is also a darker side. Inasmuch as it provided wealth and employment, its history has dogged it. Conditions of employment (whether in respect of health and safety or the social damage that may be attributed to the migrant labour system) often left much to be desired. Its history has also been associated with segregation and apartheid, and its development paralleled some features of these systems even before they were codified in law.[2]

Alan Paton gave words to this perspective through the character John Kumalo in his novel *Cry the Beloved Country*.[3]

> His voice grew louder, and he was again addressing people who were not there. Here in Johannesburg it is the mines, he said, everything is the mines. These high buildings, this wonderful City Hall, this beautiful Parktown with its beautiful houses, all this is built with the gold from the mines. This wonderful hospital for Europeans, the biggest hospital south of the Equator, it is built with the gold from the mines.
>
> There was a change in his voice, it became louder like the voice of a bull or a lion. Go to our hospital, he said, and see our people lying on the floors. They lie so close you cannot step over them. But it is they who dig the gold. For three shillings a day. We come from the Transkei, and from Basutoland, and from Bechuanaland, and from Swaziland, and from Zululand. And from Ndotsheni also. We live in the compounds and must leave our wives and families behind. And when new gold is found, it is not we who will get more for our labour.
>
> It is the white man's shares that will rise, you will read it in all the papers. They go mad when

> new gold is found. They bring more of us to live in the compounds, to dig under the ground for three shillings a day. They do not think, here is a chance to pay more for our labour. They think only, here is a chance to build a bigger house and buy a bigger car. It is important to find gold, they say, for all South Africa is built on the mines.
>
> He growled, and his voice grew deep, it was like thunder that was rolling. But it is not built on the mines, he said, it is built on our backs, on our sweat, on our labour. Every factory, every theatre, every beautiful house, they are all built by us.

This is a complicated legacy, which today has made the mining industry a particular target of policy – as well as resentment. There are clear legacy issues, and these have burdened mining with a symbolism that often extends beyond the industry itself. In addition, mining has been targeted by politicians for over a century on largely ideological grounds. For Afrikaner nationalists, little embodied the rapacious, disruptive dominance of the British Empire more than the mining magnates. For African nationalists, it is a reminder of colonial conquest and dispossession. For the political left, mining was emblematic of the abuses of big business, an abuser of workers and a conspirator with imperialism. It was the avatar of what would later come to be described as 'white monopoly capital'.

For a county in desperate need of growth and development opportunities, mining remains a prime focus of state attention – as has been the case since the discovery of the country's mineral potential. South Africa's National Development Plan, still nominally the guide for the country's development, suggested a prominent role for mining and pinned hope on creating 300 000 direct and indirect jobs through the industry.[4] Yet the Plan also acknowledged the numerous challenges that confront the industry.

> *In 2018, the output of the industry stood at R356bn, according to the Minerals Council South Africa.*

South African mining is strained, and indications for the future are not encouraging. The 2018 edition of *Mine SA*, PWC's annual analysis of the mining industry, lays this out.[5] While the 2017/18 financial year was better than the preceding year, the overall impression is of a deeply troubled part of the economy.

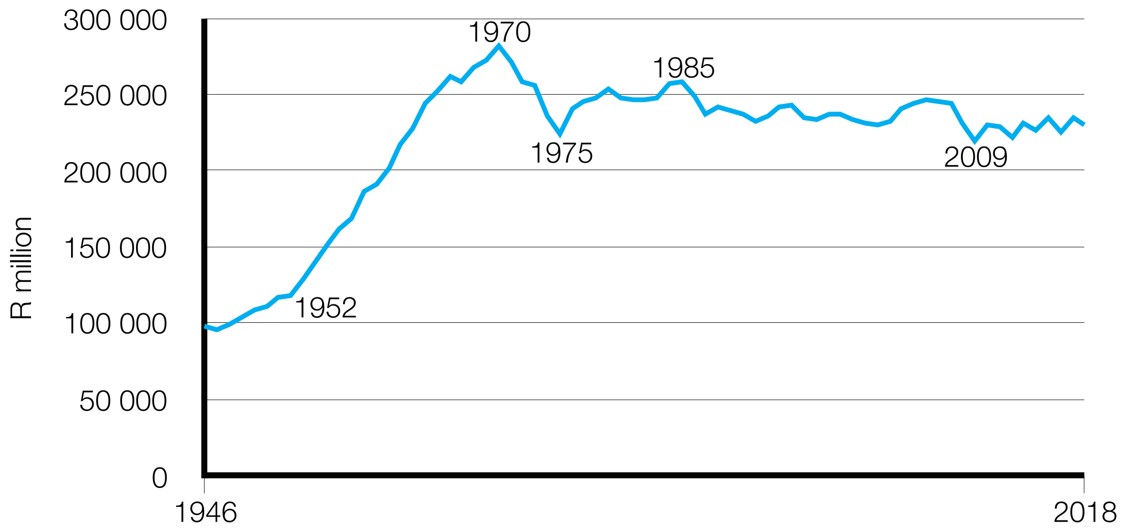
What follows is an analysis of the state of the country's mining industry, what current trends reveal about it, and how it might be rejuvenated – provided an appropriate environment is put in place.

Reports of mining's death: persistent, but (hopefully) exaggerated

Mining is often described as a sunset industry. It is, in this view, yesterday's economy whose decline must be managed as South Africa seeks out new opportunities. While there is much compelling evidence to support this line of thought, there are equally numerous considerations that argue for its ongoing importance and role in the future.

Mining has long been a mainstay of the South African economy, and remains one today.[6] In 2018, its output stood at R356bn, according to the Minerals Council South Africa (MCSA).[7] Its historical rise and trajectory is well represented in the table below, which plots its output (expressed in constant prices for the sake of comparison) for the post-Second World War period. From the 1940s, it entered a period of accelerating development, peaking in 1970, at R281.9bn. From there, there began a gradual decline, with a low point in 2009, of R218.8bn. This revived a little to R230.5bn in 2018.

Mining Contribution to Gross Value Addition, 1946-2018[a]



Source: South African Reserve Bank (SARB), Time Series Data, accessed 4 April 2019

a At 2010 constant prices.

It is correct that as a contributor to GDP, mining has been in overall decline for decades: it contributed some 12.1% to GDP in 1951, 14.6% in 1981 – and 8% today according to Stats SA data.[8] This is hardly an insignificant share. Moreover, mining activity constitutes an economic anchor for four provinces, contributing between 20% and 30% of their economic output: the North West, Northern Cape, Mpumalanga and Limpopo. It is even more significant for the economies of a number of rural towns.[9]

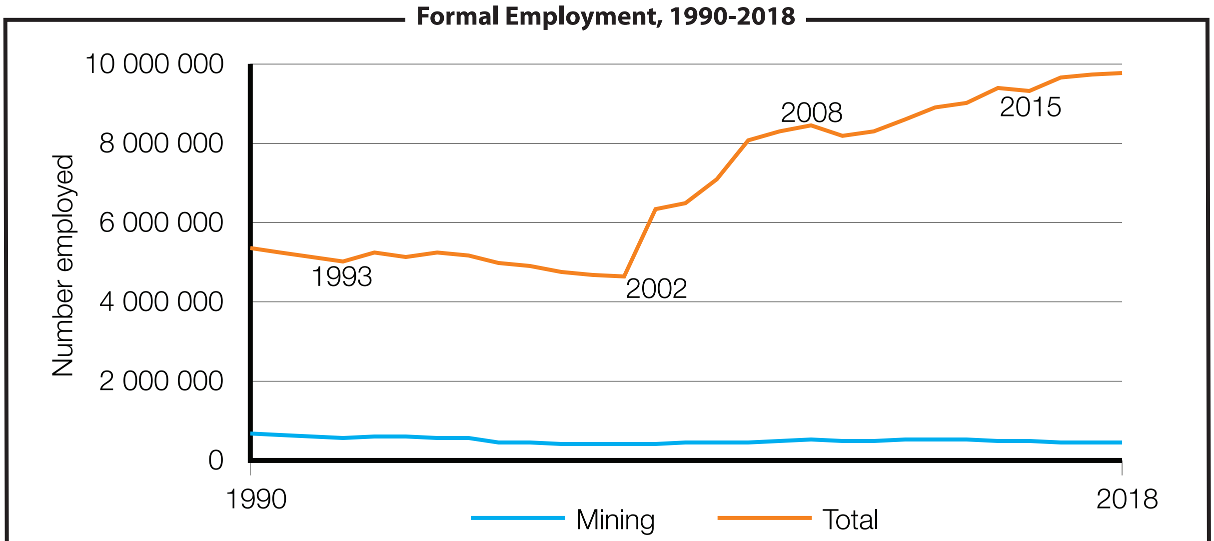
As an economic driver, mining remains a key source of investment. According to the records of the South African Reserve Bank, gross fixed capital formation in mining and quarrying amounted to some R91.1bn in 2018.[10] This is equivalent to some 10.3% of the total in the economy.

Perhaps of even greater significance for the country is the part that the industry plays in trade. The MCSA reports that, in 2018, the mining industry exported some R312bn in commodities (total sales amounted to some R465bn).[11] Of South Africa's coal, 49% (by value) is exported, of its platinum, 89%, of its gold, 50%, of its iron ore, 88%, of its chrome, 47%, of its diamonds, 55%, and of its manganese, 98%.[12] It remarks: 'The mining sector exported 66% of its production to international buyers or commodity markets. These dollar earnings are equal to half of the country's foreign reserves (+/- US$50bn).'[13]

Minerals account from over a quarter of South Africa's merchandise exports, making them critical to the country's foreign exchange earnings, and therefore to its macroeconomic health. Around a fifth of foreign investment in South Africa is in the mining industry. Mining, in a very real sense, balances the country's books.

However, compelling evidence points to a long-term decline in the mining industry, in both relative and absolute terms. South Africa's economy has undergone a profound structural change, shifting from extractive industries to manufacturing and services. Perhaps the most profound illustration of this is in the employment statistics. Mining continues to be a significant employer, offering competitive wages to unskilled applicants, often in depressed areas of the country. But the industry has witnessed a fall in employment from 692 900 in 1990 to 451 638 in 2018 – a decline of some 35%. And, since data from the early 1990s refers only to people employed in South Africa proper (and excludes those in the erstwhile 'independent' homelands), the decline was certainly all the more precipitous.

Gold mining – the part of the industry so closely associated with South Africa's development – has been particularly hard hit.[14] According to data in an industry publication, the gold mining workforce fell from 160 064 in 2007 to 111 795 in 2017 (although its payroll doubled).[15] The trajectory of the gold mining indus-



Source: Stats SA, *South African Statistics 2010-12*; *Quarterly Employment Statistics* (QES), Statistical Release P0277, June 2018, accessed 12 November 2018.

try is also reflected in its declining global role. Jim Rutherford, non-executive director at Anglo-American, commented in 2015 that at the beginning of the 1990s, South Africa had accounted for 40% of the world's gold mining industry, but this proportion had dropped to 4% by 2015.[16] Its end has even been prophesied. AngloGold Ashanti Chairman Sipho Pityana has remarked: 'Gold is a sunset industry. It doesn't matter what you do, it doesn't matter how you do it, you are not going to be able to change that.'[17] AngloGold Ashanti announced in May 2019 that it was divesting from its remaining gold mining asset in South Africa, Mponeng mine near Carltonville, citing competing and more attractive demands on its capital elsewhere.

Part of this failure has been attributed to the inevitable decline in ore quality, the exhaustion of mines and evolution of the structure of the economy.[18] Other factors, notably problems in electricity supply in 2008, added to the stress.[19] This conjunction of circumstances is captured by Peter Leon, mining expert and partner at the law firm Herbert Smith Freehills, when he noted: 'Increased operating costs and, in some cases, declining ore grades are placing huge pressure on existing operating models. Infrastructure constraints, principally energy and logistics related, combined with ever increasing wage demands, not matched by any improvement in labour productivity, add to the industry's woes. South Africa's mining export value per capita has fallen further than other mineral commodity producers.'[20]

René Hochreiter, an analyst at Noah Capital and a former mining executive, adds, with specific reference to mining: 'Profitability is the underlying issue. Costs keep rising in deep-level underground gold mines. The costs in South African gold mines increase 10 percent every year, they are the highest in the world.'[21]

Indeed, in discussing the impact of escalating electricity tariffs in early 2019,[22] the MCSA released an analysis of the state of the industry. It showed, for example, that 71% of gold mining operations and 65% of those mining Platinum Group Metals (PGM) were marginal or loss making in 2018. This in itself is a disturbing indicator of the state of the industry, but the MCSA projected that the increases would push these up to 95% and 75% respectively.[23]

Perhaps the most telling (and concerning) indicator is that South Africa failed to take proper advantage of the so-called 'commodities boom' of the early years of the new millennium – this being a period when rising demand for commodities pushed prices up, creating unique opportunities for the relevant industries as well as the societies that depended on them. This was noted in the National Development Plan: 'The South African mining industry has performed poorly over the past decade. During the commodity boom from 2001 to 2008, the mining industry shrank by 1 percent per year, as compared to an average growth of 5 percent per annum in the top 20 mining exporting countries. The mining industry is smaller now than it was in 1994.'[24]

However, it was recognised that, even as the commodity boom was underway, South Africa's failure to draw optimal advantage from it was to a large extent a matter of policy and administrative failings – even if other factors played a role too.[25] This explanation has become broadly accepted as key to understanding the indifferent performance of the industry at a time of opportunity. It is referenced in the NDP. The commodities boom coincided, after all, with the introduction of the Minerals and Petroleum Resources Development Act (MPRDA) of 2002, effective from 2004, and the first Mining Charter, also introduced in 2004. These imposed a substantively altered ownership and regulatory system, as well as a raft of new demands, on the industry. As is explained in more detail below, this proved deeply challenging.

Another concerning observation has been the failure of South Africa's mining industry to nurture exploration. South Africa is well endowed with minerals, which in principle offer numerous opportunities for the mining industry.[26] Yet data produced by the Boston Consulting Group, an international consultancy, indicate a decline in this respect, with South Africa's spending on exploration being 'the lowest among leading mining countries', with its share of global exploration having fallen from 1.6% in 2009 – already a disappointing figure – to a meagre 1.1% in 2017.[27] John Paul Hunt, a geologist at SRK Exploration Services, pointed out to the 2019 Mining Indaba: 'Globally, around 10% of all capital expenditure in mining goes towards exploration. In South Africa, it's around 2%. We are not really replacing the minerals that we are mining.'[28]

Charmane Russell, spokesperson for the MCSA, the successor to the Chamber of Mines, said in 2018 that the industry had reached a 'crisis point', and was underperforming relative to its peers. This was illustrated by declining contribution to GDP, and falling employment. Perhaps most importantly, investment was falling. Real net capital formation fell by more than 50% between 2013 and 2017 – investment was not sufficient even to make up for capital depreciation. Said Russel: 'SA needs a stable, predictable and competitive mineral policy and regulatory environment. Another factor eroding the competitiveness was the upward relentless march of costs. Over the past seven years electricity prices have trebled with higher steel prices also impacting.'[29]

> *Even as the commodity boom was underway, South Africa's failure to draw optimal advantage from it was to a large extent a matter of policy and administrative failings – even if other factors played a role too.*

Arranging the system: policy, law and regulation

South Africa's current policy and regulatory regime is the accumulation of the overall direction it has taken since the transition to democracy. As Peter Leon has explained, it was entirely to be expected that 'after the first democratic elections in 1994, the mining industry in South Africa would be a major focus of its attention'.[30]

Anthea Jeffery of the Institute of Race Relations notes that the regulatory system must reflect an 'essential bargain': in exchange for rights to mine, and legal certainty in doing so, companies would undertake to exploit the relevant resources, to comply with its obligations (tax and so on), and make disclosures.[31] Implicitly, this recognises the large capital outlay for mining and its extended lead times, and the societal claim on some form of benefit from the country's natural resources.

In essence, the ANC was determined to spread the benefits of mining as widely as possible, and to harness its considerable economic footprint for the party's economic and social goals. This in turn meant that the state would assume a far more intrusive presence in the life of the industry. This in turn would work against the essential bargain.

After policy discussion (green and white papers were prepared in the late 1990s, new legislation was passed in 2002 – the MPRDA – which came into effect in 2004. This Act ushered in a system of state 'custodianship' of mineral resources. Mining and prospecting rights that had existed under the previous dispensation would need to be converted to rights in terms of the new act.

Leon remarks: 'The MPRDA essentially replaced the principles of private law, based on rights of ownership, with principles of administrative law based on conditional state licences. That, in essence, is the nub of the problem which the industry has faced since 2004.'

He argues further that the Act gave considerable discretion to the minister, which inevitably manifested itself in chronic uncertainty. 'The problem with the MPRDA was that there was too much back-door discretion. While the Act's requirements appear to be objective, closer examination reveals that they are not. The original version of the Mining Charter made this worse. It was vaguely worded. I told clients that this would create instability and that this in turn could lead to regulatory arbitrariness. Some companies thought that the vagueness would make things easier for them – the vaguer targets they had other than ownership, the better. But this was not how things turned out.'[32]

One issue to arise with the changes in law was the move from 'old order' to 'new order' mining rights. It was soon recognised that officials in the bureaucracies dealing with mining were using their access to information to gain personal advantage in the issuing of rights.[33]

The MPRDA also required that a Mining Charter be introduced. This would set demands for mines to meet over and above their 'normal' business. The Charter introduced in 2004 required that mines achieve 26% ownership by historically disadvantaged South Africans within 10 years – this to be done 'in a transparent manner and for fair market value'.[34] Besides this, it set out numerous targets which were essentially aspirational in nature, such as 'co-operating' in formulating development plans for communities and 'ensuring' greater participation by women ('the stakeholders aspire to a baseline of 10 percent of women participation in the mining industry within 5 years').

> *'The MPRDA essentially replaced the principles of private law, based on rights of ownership, with principles of administrative law based on conditional state licences. That, in essence, is the nub of the problem which the industry has faced since 2004.'*

President Jacob Zuma's tenure has been widely recognised as a time in which policy was allowed to descend into particularly serious volatility. This hit the mining sector especially hard, arguably harder than any other part of the economy. Emblematic of the problems that began to confront the mining sector was that the nationalisation of the industry made a reappearance in policy discussion. Harking back to the Freedom Charter – a document setting out the ANC's demands in the 1950s – this had effectively been shelved by then party president Nelson Mandela in the early 1990s, and had largely been regarded as having been taken off the table as a policy option.

President Zuma, however, was the figurehead for a heterodox coalition for whom nationalisation seemed an attractive option. To some degree, this was ideological, with 'left wing' thinking making a noisy return. It was encouraged by the world financial crisis – which was presented as evidence of the failure of capitalism – and the supposed successes of leftist-populist regimes in some parts of the world. The example of Venezuela was frequently held up as a sound, inclusive development path that the country could emulate. That this took place against a background of stubbornly high unemployment and persistent poverty and inequality (phenomena for which the 'left' indicted former President Thabo Mbeki as the so-called '1996 Class Project'[35]) gave these calls added weight.

While some ministers spoke out against these ideas,[36] President Zuma's attitude to this was difficult to discern. He would typically claim that nationalisation was not ANC policy, but that the issue could be debated. Ultimately, a type of compromise was reached within the ANC, in terms of which state involvement in the mining sector would be researched.

The research team produced a report in 2012 entitled State Intervention in the Mining Sector (SIMS). It steered away from nationalisation, but recommended sharpening government powers over the mining industry. These included a 50% tax on 'windfall' profits and a policy focus on beneficiation.

Thus, the conference resolved that the 'state must capture an equitable share of mineral resource rents and deploy them in the interests of long-term economic growth, development and transformation'. Greater control over 'strategic' minerals was a key focus. It also indicated that 'state intervention, with a focus on beneficiation for industrialisation, is urgently required in the minerals sector'. A state mining company would be one of the instruments to achieve this, as would taxes to direct minerals at suitable prices for desired industrial activities.[37]

The overall thrust of the SIMS report was accepted by the ANC at its July 2012 policy conference. In other words, it reverted to prescriptive, statist impulses.

At around the same time, the National Development Plan, supposedly a master narrative for socio-economic progress, put forward a contradictory approach. It pointed to the difficulties in beneficiation, and also to the hard real-world problems that had become overbearing for the industry. Interestingly, it touched on 'regulatory and policy frameworks that hinder investment'.[38] Its proposal was, among other things, to ensure certainty with respect to property rights and amending the MPRDA to 'ensure a predictable, competitive and stable mining regulatory framework'.[39]

Despite the supposed centrality of the NDP to its development (although never in reality seriously implemented), government nevertheless opted to ignore it. An amendment to the MPRDA was taken to Parliament in early 2013. This reemphasised the commitment to beneficiation and expanded the minister's discretion over the mining sector. Minister Ngoako Ramathlodi, who had come to office after the 2014 elections, prevailed on Zuma not to sign the draft and it was sent back to Parliament, reworked in some ways, and ultimately withdrawn in 2019.

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Meanwhile, new iterations of the Mining Charter had been introduced. A second Charter (or an overhaul of the original) was introduced in 2010. This was far more prescriptive that the original, setting numerous targets (quotas in all but name) in such areas as affirmative action and procurement. However, even among those notionally sympathetic to the objectives of the Charter, there were persistent concerns at the burden imposed by the Charter and the impact this would have on the industry. One commentary phrased it thus:[40]

> It represents a significant attempt by the South African government to increase participation in the mining sector by HDSAs. While these measures are to be applauded, their impact and ability to effect the proposed changes in the South African mining regulatory regime remain to be seen. Initial industry reaction to the new measures would suggest that the South African government has introduced more uncertainty to the regulatory regime than intended and further steps will have to be taken to provide the clarity and consistency required to implement these new rules.

However, an attempt to impose a further Mining Charter (Mining Charter III) pushed uncertainty and industry dissatisfaction to new highs. Indeed, the minister responsible – Mosebenzi Zwane – was himself a highly controversial choice and it was widely speculated that his appointment in September 2015 was orchestrated by the influential Gupta family to serve their interests.[41]

One of the signature issues was ownership. Based on the 2010 Charter, the Department of Mineral Resources said that only 20% of companies were compliant with ownership demands. It hinted at cancellation of mining rights as a result. The proposed Charter would have increased the empowerment requirement for existing and new mining rights from 26% to 30% – within a year. This was alongside a raft of other escalated requirements. A year of discussions followed, and in June 2017 a revised Charter was produced. It disregarded virtually all input.

The relationship between the minster and the Chamber of Mines was thoroughly damaged. The Chamber turned to the courts to prevent the implementation of the Charter, contesting the procedures followed in drawing it up, the minister's powers, definitions in the Charter, ownership as well as a slate of non-ownership matters (procurement, employment equity, and so on).[42] One outcome of this process was that the North Gauteng High Court issued a declaratory order in April 2018. The government could not impose additional requirements to those that existed at the time that the mining rights were issued. Historic empowerment deals must be recognised – even when empowerment partners exited deals, they would be regarded as contributing to the mandatory empowerment level, in other words, 'once empowered, always empowered', or the 'continuing consequences' principle.[43]

This judgment was followed in time by President Ramaphosa's ascent to the Presidency, which was widely seen as offering the possibility of a turnaround in policy. The new mining minister, Gwede Mantashe, showed a greater willingness to engage with the industry. After some consultation, a new mining charter was implemented. It represented a compromise, but was generally favourably received by the industry. Existing mining rights would only require a 26% empowerment stake, which meant that the Charter recognised historic empowerment deals, in line with the court ruling. Empowerment conditions were toughened in other respects – for example, renewing or transferring mining licences would depend on a 30% empowerment holding.

One practical manifestation of this is likely to be the erection of obstacles in the path of junior miners, given the elevated empowerment demands, and the relatively restricted definition that the Charter accords them – an upper limited being a turnover of R150 million.

The empowerment demands for the renewal of rights was clearly one of the reasons for the MCSA's announcement on 27 March 2019 that it would apply for judicial review and the removal of particular clauses of the Charter. These would be 'detrimental to its sustainability'.[44]

> *The new mining charter represents a compromise, but was generally favourably received by the industry. Existing mining rights would only require a 26% empowerment stake, which meant that the Charter recognised historic empowerment deals.*

Perhaps of greatest potential concern is the possibility that the Charter could be altered to introduce (or reintroduce) additional burdens. As a recent IRR study remarks: 'The Charter retained one of the major concerns for mining companies; the right of the minister of mineral resources to review the Charter at any time in the future.'[45]

It is important to note that the volatility described here draws largely on the most prominent 'big picture' policy debates of the past two decades. This is far from the whole story. Mining is exposed to far more. For example, distinct legislation governs health and safety issues on the country's mines (the Mine Health and Safety Act of 1996). A point of particular concern has been the use of Section 54 of the Act, which empowers the DMR's inspectors to shut down operations if they feel that dangers to personnel are present. A reasonable and necessary precautionary measure, its application has been highly controversial and expensive. One analysis found that the cumulative financial cost of Section 54 stoppages in 2015 was some R4.8bn[46] – not an insubstantial sum for an industry under stress. This was especially so when many of the stoppages were objectively unnecessary.

Things came to a head of sorts in 2016 when inspectors ordered a complete shutdown of AngloGold Ashanti's Kopanang mine near Orkney, although the risk applied to a small part of the mine, affecting only some 2% of the workforce. The mining company took this to court, and Judge Andre van Niekerk ruled the inspectors had overreached themselves. He commented: 'The Mine Health and Safety Act has as its commendable purpose the promotion of a culture of health and safety and the protection of health and safety of those employees employed in mining operations. But that does not entitle those responsible for enforcing the Act to act outside the bounds of rationality.'[47]

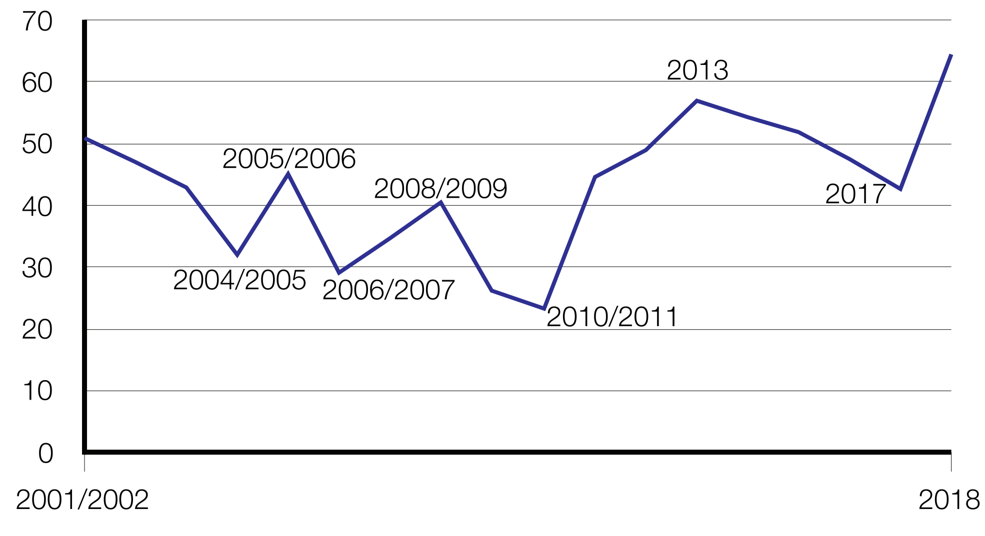
Indeed, an analysis carried out by Eunomix said that policy interventions by the South African government in the industry (such as the MPRDA and the Mining Charter) were motivated by a desire to grow the industry and to 'transform' it – bringing employment, management and so on into alignment with the country's demographic characteristics – while also spreading socio-economic benefits. The actual outcome was that these interventions produced market inefficiencies, and exacerbated other problems. Policy interventions were neither enhancing efficiencies, nor altering the market as their mandates demanded.[48]

To this should be added other risks, which are not typically associated with mining, but exist in the broader economic policy debate – and thus may in time influence sentiment in mining. Foremost here is the drive towards Expropriation without Compensation (EWC). It is notable that the abridgement of private property rights found a key expression in the custodial seizure of mineral resources. The determined advance of this agenda – which implies, above all, the expansion of government discretion in respect of privately owned assets, and the corresponding shrinkage of control of them by their owners – may have profound implications for the industry. This is not necessarily merely a case of landholdings coming under threat, but it could well introduce new uncertainties into the economy and set a precedent for regulatory or custodial takings in other spheres too.[49]

The country's broader land politics is certainly having on impact of mining. Comments Peter Leon: 'EWC is not a big issue for miners, as their interest is in mineral rights, and these were nationalized when the MPRDA took effect in 2004. However, the country's land politics is an issue, as the courts have been showing a growing commitment to asserting traditional communities' land rights. Whether they will be able to access deposits, and on what terms, is a strategic issue for the industry in the future. There is a growing move towards the principle of requiring free, prior and informed consent in relation to mining on community-owned land which, if it takes off, will be an entirely different ball game.'[50]

The impact of all of this was well represented in the annual survey of mining across the world by the Fraser Institute, a Canada-based think tank. Its Policy Potential Index (later renamed the Policy Perception Index) measures views of the state of the policy environment, and the confidence it reveals shows an overall coincidence with these developments.

Policy Potential Index – Policy Perception Index



Source: The Fraser Institute[51], *Survey of Mining Companies*, Various Years

Hence, following the introduction of the first Mining Charter, sentiment began to fall, recovering somewhat, then falling erratically over the next decade. Sentiment improved markedly in the next decade (in the years after the second iteration of the Charter), but began to fall again soon thereafter. This fall coincided to a large extent with Zwane's tenure and the attempted introduction of the Charter that he championed. In the last year, as relationships improved, so did confidence in policy. Indeed, in 2018, the index stood at its highest point in the entire period. Whether it can sustain this is an open question. The Fraser Institute's 2018 report records two interesting comments from participants in the survey, which cast some doubt on this. An unnamed exploration company vice-president comments that 'South Africa's revised Mining Charter continues to be an absolute deterrent for exploration companies', while an exploration company president remarks that 'rules around mining ownership discourage investment'.[52]

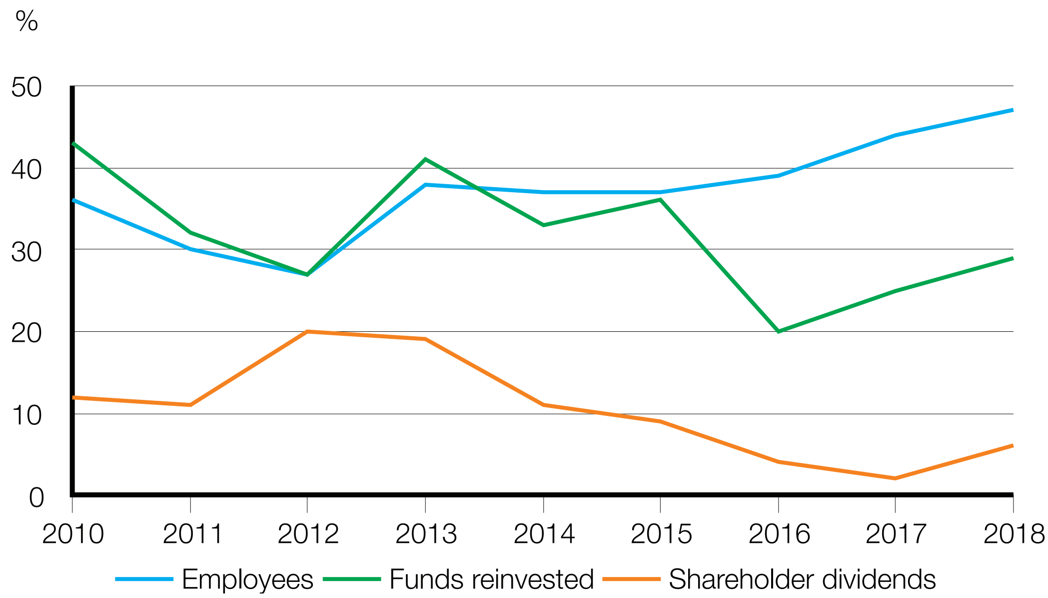
It should, though, be recognised that with the single exception of that for 2018 – this being 64.57% - none of its scores could be considered satisfactory. Across the 18 reports, South Africa's score exceeds 50% in only five. Three fall below 30%. Poor policy performance has been the norm.

Labour: minds and muscles

Mining has historically had a vast demand for labour. Significantly, it has provided employment opportunities to poorly skilled workers – an important contribution it continues to make today, even as the economy as a whole has placed greater emphasis on skills. Yet, as has been shown above, recent decades have seen a sharp decline in its overall workforce. Reports of retrenchments in the industry are commonplace.

This decline is a signifier of a number of important trends, with significant implications. According to the MCSA, the industry paid out R127.4bn in employee earnings in 2018, against a contribution to GDP of R356bn.[53] Labour is thus a substantial contributor to the industry's overall costs structure. This is underlined by data contained in PWC's annual study, *SA Mine*. Of the value distributed by the industry, it put at some 47% the proportion that accrued to employees in 2018 – an increase of 11 percentage points over the 36% in 2010. Funds reinvested, by contrast, had fallen from 43% in 2010 to 29% in 2018. Shareholder dividends had declined from 12% in 2010 to 6% in 2018.[54]

Value Distributed



Source: PWC, *SA Mine 2018* (10th edition), South Africa: PWC, 2018, p19

There are dangers for the industry in this. It indicates a situation in which wage costs (even as employment falls) are consuming a growing portion of available funds in an environment of indifferent profitability, and declining investment. This, the report says, is not sustainable.[55]

For the mining industry, this is a prime explanation for the fall in jobs. Demands for higher wages are not matched by rising productivity or profitability. The upshot is regular cuts in the workforces. René Hochreiter remarks: 'Everywhere else in the world, mining companies reduce costs year after year and become more efficient. Not in South Africa. Wages increase every year irrespective of whether productivity has improved. Labour strikes are incessant and devastating for productivity.'[56]

In discussion of productivity and the labour needs of mining, skills shortages are frequently cited as a constraint.[57] However, the extent of the skills shortage is a matter of debate. A report in 2012, for example, argued that the shortage of high-end mining related skills – such as engineers and geologists – stood at only 1.6%. This was based on workplace skills plans submitted to the Mining Qualifications Authority. Prof Fred Cawood, an academic at the University of the Witwatersrand, pointed out: 'A qualified person in mining does not mean someone who holds an academic qualification – it is the combination of the qualification, experience, which we refer to as the "hard yards", and willingness to start at the bottom. The shortage of 1.6% referred to might be a lot bigger in this context.'[58]

Cawood added that demand for skilled labour is likely to vary with demand for commodities, and so shortages would not be constant over time. Some mining skills may be suited to other industries, meaning that the mining industry must compete with attractive job opportunities in other parts of the economy.[59] To this might be added that foreign jurisdictions have their own skills challenges – something that may become pronounced as the industry expands or moves towards greater innovation. (This is discussed below.) Since high-end labour is mobile, South Africa faces international competition for its limited pool of skills.[60]

This substantively echoes the views of Mustak Ally, head of skills development at the MCSA. He says that there is little empirical evidence of mining operations being undermined by a lack of skills to fill particular positions. Rather the issue is whether skills can be retained in the industry, and whether they can be adapted to changing conditions as the industry undergoes its inevitable evolution.[61]

> *The extent of the skills shortage is a matter of debate. A report in 2012, for example, argued that the shortage of high-end mining related skills – such as engineers and geologists – stood at only 1.6%.*

Labour relations: an historical wound

This exists alongside a labour relations environment that is frequently marked by hostility and recklessness. Indeed, strike-related violence is a long-standing pathology in South Africa (and one by no means confined to the mining industry). In 1987, with political tensions in the broader society at boiling point, a major strike – one of the most extensive in the country's history – was called by the National Union of Mineworkers (NUM). It is estimated that some 340 000 workers downed tools. Notably, the strike was attended by some gruesome violence, including semi-formalised kangaroo courts instituted by strikers. It is estimated that 18 people were killed and over 500 injured.[62]

Perhaps most notoriously, in 2012, 34 miners were shot by police officers (the largest loss of life in a single incidence of such state action since the 1960s) at Marikana in the North West. This followed extended strike and protest action at platinum operations owned by Lonmin. The strike had been marked by violence, with 10 people killed.[63] One of the defining features of this series of events was the animus between NUM and the Association of Mineworkers and Construction Union (AMCU). The latter was challenging the dominance of NUM, which was facing criticism for having become embedded with management and out of touch with workers' interests.

More recently, AMCU – donning the mantle of worker militancy – led a strike after a wage agreement was accepted at Sibanye-Stillwater gold mine by the company, and three other unions (NUM, Solidarity and the United Association of South Africa (UASA)). AMCU demanded higher increases than the others had accepted, but Sibanye argued that as AMCU was not a majority union (it said the other unions accounted for over two thirds of the workforce), the agreement was valid.[64] Over the course of the resultant five-month strike, nine people were killed and much property damaged, including the torching of some 60 houses. Rival unions accused AMCU of intimidating their members.[65]

AMCU's conduct was also condemned by a Labour Court Judge, Connie Prinsloo. In ruling against its application for secondary strikes across the industry, Judge Prinsloo remarked: 'It is, indeed, a sad reality that there has been a track record of violence and intimidation where industrial action has taken place, and Amcu is in no position to dispute the allegations made by the applicants in respect of their own past experiences, and in respect of the horrendous violence displayed during the ongoing Sibanye strike. The conduct of Amcu's members certainly tainted its reputation as a trade union that supports peaceful industrial action.'[66]

A mining executive interviewed for this project reports that inter-union rivalry has become a serious concern for the industry, disrupting operations and threatening the safety of staff in times of tension. This might manifest itself in acts of planned violence where, for example, workers might literally be ambushed and attacked on their way to work.[67]

Infrastructure: the sinews and arteries of industry

Mines invariably require an extensive system of infrastructure to enable them to operate. Historically, the economic dynamism created around South Africa's mining was a prime mover behind the expansion of South Africa's transport systems and power supply.[68] The damaging impact that infrastructural deficiencies have on South Africa's economic prospects – both in general and in respect of mining specifically – have been much discussed over the years. This is evident from government's own initiatives (such as the National Development Plan), and analyses by the private sector.[69]

Nowhere has this become more pronounced than in respect of electricity. South African mines are voracious consumers of the country's electricity. Eskom puts the proportion consumed by the mines at some 14.2% of the country's total.[70] The MCSA puts the industry's consumption closer to 30%, if such activities as smelting and refining are included.[71]

> *Rising electricity prices pose in some instances an existential threat to mining operations. to some 95% and 75% respectively.*

South Africa's power supply problems have come to pose a significant problem to the mining industry. A failure to properly plan for the country's power needs was exposed in early 2008 when mining activity was severely curtailed for a while as Eskom was unable to maintain power supplies. This had implications far beyond the ability to maintain production; it related directly to the safety of the mining workforce, a steady supply of electricity being essential to enabling underground work, and to evacuating workers if necessary. Frans Barker, then an executive at the Chamber of Mines, said at the time: 'Future shortages have left investors quite worried. It's going to impact on expansion and new investment in mining.'[72]

This would turn out to be a prescient comment, and the quality of energy supply has become a significant strategic issue for the industry. Subsequent instances of power interruptions were greeted with the same concerns for the damage they represented to the industry.[73] PWC's SA Mine 2018 listed 'reliance on third party infrastructure with the cost and availability of electricity and water still a concern'.[74]

Rising electricity prices pose in some instances an existential threat to mining operations. The MCSA noted in early 2019 that tariff increases granted to Eskom by the National Energy Regulator of South Africa (NERSA) – a tariff increase of 9.4% was granted for 2019/2020, of 8.1% in 2020/2021, and 5.2% in 2021/2022 – would put numerous mining operations in jeopardy. It said that 71% of gold mining operations and 65% of those mining Platinum Group Metals (PGM) were marginal or loss making in 2018. The NERSA tariffs would over three years likely raise these figures to some 95% and 75% respectively.[75]

The failures of the Eskom electricity system have led to some mines investigating alternatives. One of these is renewable energy, whose declining price and suitability for environments where power utilities' footprints are not readily accessible would make them increasingly attractive, even in the absence of concerns about Eskom. According to Theuns Ehlers, who heads Resource and Project Finance at Absa Corporate and Investment Bank, mining companies are looking at getting renewables to take up 20% to 30% of their power needs.[76] It is not, however, clear whether renewable energy is a solution for an industry so critically dependent on a plentiful supply of power. It also implies a significant additional investment, a case of 'bring your own infrastructure', that is jarring for a country with a relatively advanced and mature economic base.

One industry executive, who declined to be identified for professional reasons, remarked: 'It's too expensive to replace all your power generation, but adjusting the mix to allow for 30 to 40 percent of own-generated power makes sense. This is a significant offset. Solar power is the most obvious choice for generation, but for the most part, rolling this out is still in the ideas phase. We have a problem with Eskom and Nersa, since they need to approve any scheme that produces above 1 Megawatt. If you build it on the property where your mine is located, you can avoid the problems that come with transmission. But providing your own power raises a lot of issues. There is a lack of clarity on the regulatory side. I think that there are close to 30 pieces of compliance you need to work through before Eskom and Nersa approve the scheme. So what this means is that to do this, we have to sacrifice the core business of mining to providing electricity. But mines are prepared to do this to secure supply, to have some offsets and to get some price certainty.'[77] (Minister of Energy, Jeff Radebe, announced in mid-May 2019 that National Energy Regulator of South Africa (NERSA) would be permitted to licence businesses to establish small-scale generation projects without needing him to sign off. This represents some progress.)[78]

What has undermined the power system (in part at least) is familiar to the mining sector: a policy mix motivated by ideology and particular interests rather than by pragmatism and the core business of the utility. Eskom had long operated its power stations on the model of 'tied mines' – stations would be constructed near coal pits, so that the feedstock would be supplied immediately and directly, sometimes via conveyer belt. Eskom would finance the capital and operating costs, plus a small incentive for the private sector to run the mines.

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However, in 2016, Eskom's then CEO Brian Molefe announced that it would no longer follow this model (which it had in reality been drifting away from for some time). It complemented this by demanding that its coal suppliers had to be 51% black-owned, this far exceeding the demands made by any iteration of the Mining Charter. Preference was thus given to smaller black-owned operations, and which invariably meant that coal had to be trucked into the stations.

Policy analyst David Christianson pointed out in a 2018 article the consequences of this. Kusile, one of the not-yet complete power stations under construction as a response to the 2008 blackouts, is actually located near an extensive coal resource named New Largo – but no mine exists there. When the area was owned by Anglo-American, it proved impossible to conclude a supply agreement, as the proposed mine would not be in compliance with Eskom's required empowerment criteria. So, despite the presence of abundant coal, coal would need to be trucked in.[79] (Ownership has since passed to black-owned Seriti Resources, and it remains to be seen if a coal supply arrangement will come to fruition.)

Besides electricity, logistics systems have been a source of concern – again, not only for the mining industry, but given the latter's extensive demands, logistics constitute an important strategic issue. Where large volumes of mineral ore, or big consignments of equipment are to be transported, rail is intuitively a better option. It plays a key role, in particular, in moving ore between mines and ports.

Industry representatives remark that the failings of the logistics system represent a brake on potential. 'Rail and ports,' he comments, 'apart from instances where things really fall apart, such as where you have derailings on the iron ore lines, the issue is really one of the constraints to growth that they represent. Most of the time, we can get our cargo to Saldanha or to Richard's Bay, but we could probably expand our exports with lines that could handle more. The manganese exporters are very keen to hop on to some of these routes. So, it's not so much an immediate problem as what it means for the future of the industry.'[80]

However, the rail network is afflicted by problems, which compromise the ability of particular parts of the mining industry to grow and operate optimally. The management of the rail company, Transnet, has long been of concern.[81] Allegations of corruption and 'capture' abound.[82] This was underlined by acting Transnet Group CEO Tau Morwe, speaking on the sidelines of the 2019 Mining Indaba, who commented that Transnet – the state-owned company responsible for rail and ports – was examining a staggering 345 reports on malfeasance that the company had accumulated but whose findings and recommendations may not have been acted upon.[83]

Meanwhile, the practical problems in the rail system are serious. Morwe remarked that Transnet had spent some R42bn on its rail system in the preceding decade, but its infrastructure had actually deteriorated over that period.[84] Coal and iron ore miners view this as a key hindrance.[85] As in the case of Eskom, Transnet has pledged to address its deficiencies (it is 'implementing a new, fit-for-purpose operating model aimed at ensuring Transnet's sustainability and looking after customer needs, as a key first step to ensure that it can overcome its operational and financial difficulties'[86]).

Operational difficulties have certainly been a problem. A graphic example was the derailment of trains carrying ore between Kumba Iron Ore's mine at Sishen and the port at Saldanha Bay in 2018. This compelled Kumba to declare force majeure (essentially, indicating that an event over which the company had no control had prevented it from fulfilling contractual obligations).[87] Kumba estimated that these derailments cost it some R2bn in revenue.[88]

The use of road transport has come with its own set of issues. Similar to the rail system, the road network's state of repair is variable or in some respects concerning. Eskom's strategy of procuring coal from smaller, black-owned mines not located near stations has placed great stress on rural roads (there is some evidence that their condition has acted as a disincentive to suppliers and logistics companies[89]). This may create an ongoing dilemma of road degradation as heavy-duty vehicles traverse them.

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Unfortunately, the weaknesses of the railways make road transport in some respects the only viable option. Rail transport is not always a cost-effective option. René Hochreiter remarks that during the course of one mining deal, the prospective costs of rail transport offered no advantage over the roads.[90]

These infrastructural problems, which have arisen in no small measure as a result of the failings of state-owned enterprises, were eloquently captured by an editorial in the *Business Day*. It is worth quoting at length:[91]

> Let's rewind a decade or so to Eskom's rolling blackouts of 2008 when mining companies were forced to cut their electricity consumption. On top of this, attempts by some to build their own power stations to reduce reliance on Eskom, which was growing increasingly unreliable and expensive, died a Kafkaesque death somewhere between Eskom, the Department of Energy and the National Energy Regulator of SA.
>
> Solar energy is not an option for energy-intensive users who send thousands of workers underground daily, relying on power to ventilate and cool shafts and transport people in and out. And so the investment dollars — and jobs — started flowing elsewhere, to places with reliable and available power supply where tariff increases were likely to stick to inflation. Electricity costs now account for 20% of South African gold miners' costs, the second-largest item after labour, which accounts for just more than half.
>
> The impact was felt much wider than the gold sector. Remember, for example, Rio Tinto's cancelled plans to build an aluminium smelter at Coega, and African Rainbow Minerals and Assore's decision to build their manganese smelter in Malaysia.

> Eskom isn't the only state-owned enterprise to blame. Other infrastructure constraints and costs, and the effect on production and growth, have been well documented. The coal industry's battles with Transnet are one example; look out for Kumba Iron Ore's results on July 24 to see what a large number of derailments can do to a company's bottom line.

Modernisation: gazing onto new horizons

A combination of the limitations of conventional mining techniques and the opportunities created by technology has raised to a major strategic consideration the question of modernisation – an idea which is a sort of portmanteau for the transformation of the industry towards more innovative production methods, among other things. This is by no means unique to South Africa, although in the South African case, it does imply far-reaching adaption of the labour intensive processes that have historically been the foundation of mining.

South Africa's minerals production is not only declining, but many of its mines are coming to the end of their lives. The country has been estimated to dispose of some R2.5 trillion in mineral deposits – although not all of this is readily accessible.[92] The application of new technological solutions might change this. Arguably the key implication here is a move away from labour-intensive methods.

ENR Global, a global recruitment firm specialising in energy and natural resources, based in London, has this to say:[93]

> Like all other sectors repetitive and low skilled jobs in mining will be substituted by technology. However, in the long run there will be creation of new jobs that are technology focused. The only way companies can cut costs and increase efficiency will be to embed digital technologies in every dimension of how mines are built, operated and managed.
>
> New technologies are impacting the sector in a positive way and will continue to help mining companies become more efficient. The 'digital mine' will be a reality and Artificial Intelligence and big data will empower knowledge workers. To seize the full potential of digitisation, mining companies must prepare today's workers for tomorrow's jobs.

The MCSA believes that, successfully implemented, mechanisation could extend the life of a low-grade mine that is being conventionally worked from four years to fifteen – or even as much as 25.

The MCSA argues that modernisation will be essential to extend the life of the industry, and that in doing so, jobs will be saved. Of the total gold resources in the country – 592 Metric Tons (MT) – 496 MT could be converted to mechanised mining systems. Of this, 106 MT would involve ultra-deep, full-time mechanisation. These are precisely the deposits that are most inaccessible at present.[94] In respect of PGMs, of the 763 MT resources available, 460 MT could be mechanised, failing which, a large portion could simply not be mined economically.[95]

The MCSA believes that, successfully implemented, mechanisation could extend the life of a low-grade mine that is being conventionally worked from four years to fifteen – or even as much as 25. 'Rolled out across the industry,' and MCSA document argues, 'modernisation could unlock the potential of an equivalent 11 large gold mines and eight platinum mines. In this way, modernisation not only preserves existing jobs, but also creates new jobs, so contributing safely and profitably to the economic development of the communities surrounding mining operations and society at large.'[96]

Modernisation is enthusiastically discussed at mining conferences, as a foundation on which the future of industry is to be built. Various initiatives to foster multi-stakeholder cooperation and research and development have been launched in recent years. These include the 2015 Mining Phakisa, a forum for engagement among stakeholders for the future of the industry; the Mandela Mining Precinct, as a centre for innovation and research; and the University of Pretoria's virtual reality centre, a state-of-the-art training centre.[97]

In operational terms, such modernisation is expressed (in a far from complete list) in the use of proximity devices to manage locomotives; non-explosive rock breaking, with intriguing developments in microwave and laser technology; advanced information management; computer mapping systems; and excavation equipment. Each of these is intended to make extraction of value more efficient as well as to mitigate risks to the workforce.

Modernisation in this sense will demand an elevated level of skill in the workforce. As minister of minerals and energy Gwede Mantashe commented: 'The question of technological change in the industry is a new factor. We are not going to create the same type of jobs; the likelihood is that we are going to create new types of jobs. The industry... must position itself to be part of the change." [97]

However, questions have been asked as to the extent to which this can in practice be rolled out. René Hochreiter argues that labour-intensive extraction endures because it is a practicable solution to the realities of the industry.[98] Sibanye CEO Neal Froneman notes likewise that the nature of mining in South Africa is such that labour-intensive methods will remain for some time to come.[99]

Nevertheless, mechanisation is an ongoing process. Sietse Van Der Woude, specialist in modernisation at the MCSA, remarks: 'It is happening in all commodities. Gold mining is a major challenge due to depth, narrow reefs, hard rock and steep inclines. Old platinum mines also, but they are further advanced.'[100]

The MCSA argues that modernisation is not only a case of improving operational efficiency or deploying more machinery. Its position paper on the subject terms it a 'people-centred' process, which demands extensive reskilling of the workforce to meet the demands of a new generation of mining. It foresees greater cooperation across the economy and value chains to deal with bottlenecks and extract optimal value.

Chris Griffith, CEO of Anglo American Platinum, has likewise remarked: 'Modernisation is not just about innovation, new technologies, mechanisation and automated processes. We will only attain our vision of a modern mine if we work in partnership with our employees, government, unions and NGOs. This is particularly the case in how we go about upskilling and improving the lives of our current and future workforce.'[101]

> *The deficiencies in the country's education system, coupled with emigration, could place a very real brake on the possibilities of modernisation. A high-technology industry implies a growing demand for sophisticated skills, and the ability to adapt them to challenges as they arise.*

Among the key challenges is the state of education and the skills pipeline, even if labour-intensity is to be the model in the immediate future. The MCSA comments: 'The Minerals Council views modernisation as an opportunity to address some of South Africa's most concerning educational and employment problems. The country's education system, which is inadequate for many people, often leaves its learners without the knowledge and skills necessary to compete in the global economy.'[102]

The deficiencies in the country's education system, coupled with emigration, could place a very real brake on the possibilities of modernisation. A high-technology industry implies a growing demand for sophisticated skills, and the ability to adapt them to challenges as they arise. While the industry engages in a great deal of training already, it is likely to struggle successfully to modernise unless significant progress is made with respect to South Africa's education and training systems and the ability of the economy and society to retain its skills.

This, in turn, would imply reassessing the manner in which mining operates in South Africa – a challenge that of necessity would extend to the country's current regulatory system.

Digging for the future

If mining is no longer the foundation and backbone of South Africa's economy, it remains an enormously important contributor to the country's prospects. With a multi-trillion-rand trove of minerals, there is the potential – in theory at least – for a mining renaissance. Properly handled, this could mean a new lease on life for the industry and its sustainability into the future. What might be done to bring this about?

A useful starting point is to recognise that a viable mining industry must be able to justify itself economically – as René Hochreiter put it, 'if mines can't make a profit, what's the point?'[103] Creating an environment in which this can happen must be the seminal objective of any initiative to assist or stimulate the industry.

A successful mining industry hinges on a combination of factors. Not all of these are within the control of a country's mining stakeholders. A demand for minerals (ultimately the bedrock rationale of any decision to mine) will be driven by a complex set of factors. Demand for African or Australian minerals over the past few decades was propelled by Asian (and especially Chinese) manufacturing, much of which, in turn, hinged on demand for such products elsewhere. There is little that an economy like South Africa's can do to influence this system, although it can position itself to take advantage of it.

In a similar vein, René Hochreiter argues that one of the most important considerations for South Africa's mining industry is the value of the rand ('we're all rand analysts now', he chuckles[104]). Its diminished value in the past decade has made operations worthwhile for investors. Conversely, he argues, the relative strength of the currency during the commodities boom played an important role in preventing the country from enjoying its full benefits. This is not something the industry can control, nor is it inherently a good idea for the government to try and manage it in the interests of the mining industry (even assuming this to be possible).

But as is implicit from the foregoing discussion, the revival and future progress of mining in South Africa will require action in many of those areas that are susceptible to domestic reform. That which is within the control of the country – whether the mining industry or government – needs to be optimally arranged for the sustainability of the industry.

Some initial thoughts on this may be drawn from a contrast between South Africa and neighbouring Botswana – something which the Institute of Race Relations (and others) has previously undertaken.[105]

South Africa and Botswana contrasted: Fraser Institute Indices, 2014-2018

	Country	2014	2015	2016	2017	2018
Investment Attractiveness Index	Botswana	75.10%	68.32%	77.62%	63.14%	71.66%
	South Africa	56.49%	58.04%	53.62%	62.06%	65.30%
Policy Perception Index	Botswana	90.26%	88.29%	91.79%	82.84%	94.77%
	South Africa	54.24%	51.91%	47.50%	42.66%	64.57%
Best Practices Mineral Potential Index	Botswana	65.52%	55.00%	68.18%	50.00%	56.25%
	South Africa	57.89%	62.12%	57.69%	75.00%	65.79%

Source: Fraser Institute[106]

The contrast between the two countries is, for South Africa, salutary. The Fraser Institute's 2019 report (reflecting evaluations conducted between August and November 2019) should be consulted at length. Its three key indices are presented below. The first shows the attractiveness of each as an investment destination. Here Botswana outperforms South Africa in every year, albeit with a relatively narrow margin in 2018 (and with some decline registered on the part of Botswana).

The second is the Policy Perception index, which looks at the policy and regulatory framework. Not only does Botswana score ahead of South Africa, it does so by enormous margins. In 2017, Botswana's score was nearly double that of South Africa. Even in 2018 – and the research for this Fraser report was carried out at a time when the new (generally acceptable Mining Charter) was being prepared or after it had been produced – the differential between the two countries was in excess of 30 percentage points.

However, on the Best Practices Minerals Index – a measure of the potential of the sector given a 'best practices' regularity framework – South Africa competes well against Botswana. It scored 25 percentage points ahead in 2017, and 9.54 in 2018. This strongly suggests that what is wrong with the mining economy in South Africa – certainly in comparison to its neighbour – is not lack of raw opportunity, but the lack of an appropriate environment. Botswana's experience may offer some pointers as to how to alter this.

A more detailed look at what differentiates South Africa from Botswana sheds additional light on the difficulties afflicting South Africa.

South Africa and Botswana contrasted: Fraser Institute scores, 2018						
	Country	Encourages Investment	Not a Deterrent to Investment	Mild deterrent to investment	Strong deterrent to investment	Would not pursue investment due to this factor
Uncertainty Concerning the Administration, Interpretation and Enforcement of Existing Regulations	Botswana	38%	63%	0%	0%	0%
	South Africa	5%	30%	25%	30%	10%
Regulatory Duplication and Inconsistencies	Botswana	13%	88%	0%	0%	0%
	South Africa	5%	33%	33%	24%	5%
Uncertainty Concerning Environmental Regulations	Botswana	13%	88%	0%	0%	0%
	South Africa	14%	43%	33%	5%	5%
Uncertainty Concerning Disputed Land Claims	Botswana	13%	88%	0%	0%	0%
	South Africa	0%	25%	35%	30%	10%
Legal System	Botswana	13%	88%	0%	0%	0%
	South Africa	5%	29%	43%	14%	10%
Taxation Regime	Botswana	0%	88%	13%	0%	0%
	South Africa	10%	40%	30%	15%	5%
Uncertainty Concerning Protected Areas	Botswana	25%	63%	13%	0%	0%
	South Africa	11%	61%	17%	11%	0%
Quality of Infrastructure	Botswana	13%	50%	38%	0%	0%
	South Africa	5%	60%	10%	20%	5%
Socio-economic Agreements/ Community Development Conditions	Botswana	0%	88%	13%	0%	0%
	South Africa	0%	32%	32%	32%	5%
Trade Barriers	Botswana	13%	88%	0%	0%	0%
	South Africa	11%	44%	28%	17%	0%
Political Stability	Botswana	63%	38%	0%	0%	0%
	South Africa	0%	21%	37%	37%	5%
Labour Regulations/Employment Agreements and Labour Militancy/ Work Disruptions	Botswana	25%	75%	0%	0%	0%
	South Africa	5%	16%	26%	47%	5%
Geological Database	Botswana	0%	88%	13%	0%	0%
	South Africa	16%	53%	32%	0%	0%
Security	Botswana	50%	50%	0%	0%	0%
	South Africa	0%	26%	42%	32%	0%
Availability of Labour/Skills	Botswana	0%	63%	25%	13%	0%
	South Africa	37%	37%	26%	0%	0%

Source: Fraser institute[107]

It is noteworthy that the scores as a whole are far more favourable in respect of Botswana. In no category was a deficiency viewed by any respondent as significant enough to dissuade investment entirely. In respect of South Africa, by contrast, ten such factors prompted some respondents to regard the country as unfit for investment.

South Africa scored concerningly in most categories (more than half of respondents felt that they worked against investment decisions) that might broadly be termed 'governance': uncertainty concerning administration, regulatory duplication and inconsistencies, uncertainty concerning land claims, legal system, socio-economic agreements, political stability, labour regulations and issues, and security. In most of these, Botswana scores very well. For example, 38% of respondents felt that the certainty inherent in the administration of regulations enhanced Botswana's investment appeal, and the rest felt it did no harm. In South Africa, only 5% felt it was an attractive factor, 30% that it was no deterrent, 55% that it was a minor or major deterrent – and 10% that it put off investments altogether.

On political stability, 63% felt that this was an appealing factor in respect of Botswana, and the rest that it was not a deterrent. Only 21% of respondents felt that it was no deterrent in South Africa, with 74% saying it constituted a deterrent of some magnitude, and 5% saying it was an absolute block on investment.

Moreover, Botswana has benefited from its mining economy. Certainly, a real concern exists about the overreliance on minerals – not least on the part of the country's government – but it has avoided the resource curse that has plagued so many other commodity-based economies. Between independence in 1966 and 1999 its average annual GDP growth rate was 9%.[108] This was a remarkable achievement, rivalling if not exceeding the fast-growing Asian 'Tiger' economies. A recent World Bank commentary said that its growth rate over the past decade, despite tough economic times, was at 4.4% in 2018 and was expected to remain at 4% until 2021.[109]

> *Botswana has benefited from its mining economy. A real concern exists about the overreliance on minerals – not least on the part of the country's government – but it has avoided the resource curse that has plagued so many other commodity-based economies.*

Much of Botswana's progress has been premised on its overall governance and political environment. While certainly not without challenges and maladies, it has followed a generally prudent, even conservative, course. It has maintained a genuine democracy (albeit with single-party dominance), with reasonably strong institutions. It has followed market-based and business-friendly economic policies and eschewed the statist or ideologically driven strategies that have caused damage in neighbouring Zambia and Zimbabwe.

The latter-day success of its mining industry can be attributed to its foundational legislation, the Botswana Mines and Minerals Act of 1999.[110] This attempts to manage the mining industry to the benefit of the country: 'the most efficient and beneficial use of the mineral resources'. It sets out a number of clear, actionable and generally objective considerations for the awarding of mining licences. There are no empowerment demands, just limited 'local preference' requirements. Mining licences can be cancelled on a number of specified grounds (where remedial action has not been undertaken). Unlike South Africa, it does not seek to push mining companies into beneficiation. It does give the Botswana government an option of taking a 15% stake in the mine – but this must be paid for.

Together, these engender a system that is stable, predictable, realistic and growth-focused. It understands the extremely large expenditures that mining requires, and the risks that they entail – in other words the nature of the incentives and disincentives at work. All of this is reflected in its Fraser Institute Scores.

A future for the industry, or an industry of the future?

South Africa's mining economy has fallen on uncertain times. With large volumes of value still potentially to be extracted, it could play a very significant role as a driver of the economy – but on current trends it may fail to do so.

At the same time, the industry is standing before some momentous changes. Bountiful, easily accessible ore deposits (the 'dripping roasts' of industry parlance) are rapidly becoming exhausted. Costs are rising. Demands are being placed on the industry in terms of its engagement with its many and various stakeholders. This is not only mandated by the Mining Charter, but through an emerging understanding of business' responsibility to society.[111] Conversely, technologies are raising the possibility of cost-effective extraction of previously unreachable deposits, provided the right circumstances and incentives are at hand.

The future of mining therefore demands different strains of thinking. In the short term, attention must be given to the immediate revival of the industry in terms of the existing model. Properly handled, the existing industry could have a great deal of life left in it. Even acknowledging the overall decline – which is particularly notable in the gold mining industry – much value remains. As Bernard Swanepoel, former executive at Harmony Gold and now director at To the Point, remarked of the gold industry: 'I really think it's the last chapter, but the last chapter could be a good chapter. Thirty more years of gold mining in South Africa could be a good chapter.'[112]

In the medium to long term, the modernisation of the industry needs to be anticipated. According to Mustak Ally, future mines are likely to look very different from those of today. 'We won't have big mining houses. Rather, they will be mechanised, digitised, with highly-skilled staff able to work with different sorts of competencies.'[113]

At its core, the mine of the future would make more intensive use of technology. This would enable it to perform activities that are not viable for labour-driven extraction. For example, extraction of minerals at depths where heat becomes prohibitive would be possible with specialised mechanisation. The so-called 'digital mine' offers remarkable opportunities to coordinate and manage various workstreams and the flows of information that are necessary for them.[114]

> *'We won't have big mining houses. Rather, they will be mechanised, digitised, with highly-skilled staff able to work with different sorts of competencies.'*

Other opportunities may arise through small-scale mining operations carried out with mobile units suitable for accessing small deposits, operated by a small number of highly skilled workers. Chris Gilchrist, consultant to the industry globally, enthuses about this: 'There are some amazing innovations coming out of Australia in particular. For example, we're seeing little mobile, modular gold recovery plants that can move on rail and even go underground. So, there's no need to haul tonnes of tailings out in order to get a few grams of gold.'[115]

This will require constant and aggressive innovation. For this, cooperation across industries, with governments, and with research and academic institutions, will be necessary. Mining will be on an ever-expanding pathway to do things more efficiently, and to draw on innovations elsewhere to help it to do so. Its business will inevitably become ever more bound to that of the industries with which it cooperates.

Finally, whether in the short or long term, the future of mining is intimately linked to the communities within and alongside which it operates. Cognisance of the need to respect their interests has never been higher. This is not only what modern corporate governance thinking requires, but is of crucial reputational importance for the industry. The conduct of the industry is frequently under hostile scrutiny. Sibanye CEO Neal Froneman remarks: 'Modernisation means that as an industry we must take cognisance of the fact that we have stakeholders who need to benefit from the resources that belong to all the people of this country… I am acutely aware of what our responsibilities are in terms of service delivery, and what government's are, but as a mining industry we have to do more. Whether we like it or not we have to get involved and be good corporate citizens.'[116]

A rethought system

Botswana provides a reasonable example to which South Africa might aspire. Emulating it will demand a rethink of the regulatory system that governs mining in the country. While the past year has seen a greater willingness to negotiate and listen to the concerns of the industry, and to offer concessions on some matters, much remains unresolved. Since the regulatory issues lend themselves to substantive action by government (it has decisive influence over them, and can thus influence them for good or ill), it should be of concern that this is a sphere which is widely recognised to be holding the industry back.

Recasting the regulatory framework would see the MPRDA significantly amended, if not replaced. The minimum goal of doing so should be to enhance the degree of predictability in the operation of the sector. Key here would be to curtail ministerial discretion. Granting licences, for example, should be done according to objective criteria. The threat of cancellation of licences should be restricted to a response to clear and significant violation – in other words, to a clear failure to uphold what Anthea Jeffery has described as an essential bargain between the companies and the government.

Another area to be addressed is the question of property rights. Controversies around the Mining Charters have revolved to a large degree around ownership, and demands that companies should cede stakes to empowerment partners. Security of assets being a prime consideration in any investment – and arguably even more so in mining, which demands extensive outlays and a long-term outlook – this is a disincentive, irrespective of its motivation.

That the current Mining Charter holds the requisite minimum empowerment holding for existing rights at 26% and recognises the principle of 'once empowered, always empowered' is a positive development. But as renewed and new rights will require 30% ownership, a new round of equity ceding can be expected. Equally importantly, there is no guarantee (and probably a likelihood) that demands will be escalated in future. All of this underlines the inherently problematic nature of the overall regulatory dispensation.

Following the Botswana example, South Africa should radically reduce the demands on the industry to meet empowerment targets.

> *'We need to rewrite the MPRDA in objective terms, along the lines of the Botswana model. There also need to be mandatory time limits for all licensing decisions – a certain amount of time to announce, for example, that a right has been granted or not, failing which it is deemed to have been granted.'*

Peter Leon says that the limiting of executive discretion in the industry is an established best practice. He offers the following as a means to engendering a more predictable and investment-friendly environment: 'We need to rewrite the MPRDA in objective terms, along the lines of the Botswana model. There also need to be mandatory time limits for all licensing decisions – a certain amount of time to announce, for example, that a right has been granted or not, failing which it is deemed to have been granted. South Africa should remove the high levels of administrative discretion that are currently so much a part of our minerals regime. It should also introduce an electronic online mining cadastre which many other African mining jurisdictions have done. We should introduce the system that Ghana and Brazil now have, which is an independent minerals commission to regulate the industry.'[117]

Beyond a reform of the formal systems, mining has been dogged by mistrust. This is partly an expression of ideological suspicion by many in government towards the industry. For the industry, there is frustration at the actions and attitudes of many in government, and of the regulatory volatility. The improved relationship between the two parties following the accession of Minister Mantashe is to be welcomed, but it will take ongoing engagements – not to mention real compromise – to find a relationship of cooperation.

A new empowerment paradigm

One of the most contentious issues in public debate on mining has been around ownership requirements. Demands that companies surrender a quarter of their equity – with escalations expected in future – constitute a real burden on investors and a major disincentive to investment.

The nature and efficacy of South Africa's empowerment regime has itself come in for criticism. Broad-Based Black Economic Empowerment has not produced the generalised upliftment that had been hoped for. Rather, it has tended to favour a relatively small elite, while imposing costs on business.[118]

The Institute of Race Relations has proposed an alternative system called Economic Empowerment for the Disadvantaged (EED). It is based on four 'E's: economic growth, excellent education, employment and entrepreneurship. An EED scorecard would be used to record contributions made to achieve these. Points would, for example, recognise investments, profits, jobs created or sustained, procurement, improvements to safety, contribution to environmental rehabilitation funds, supporting innovation, and contributions to taxes.[119]

The advantage of EED is that it would incentivise business activity and economic growth, thus rewarding activities that benefit South Africa's poor people. These are the elements of successful business and the necessities of a successful economy.

Labour: reform and transition

A central point of tension in any debate around mining concerns its labour issues. This was, after all, the sphere with which segregationist-apartheid abuses were most closely associated. A fundamental consideration in any discussion of the mining industry is the employment it generates. This is an important resource for the country, and maintaining it is a reasonable objective.

The financial health of the industry is variable at best, and in some sectors – such as gold – is increasingly distressed. The state in which much of the mining industry finds itself carries grave implications for its ability to absorb labour. Greater flexibility in the labour dispensation would provide some relief. In conceptualising the future, it is unlikely that anything else will act to retain high levels of employment.

However, while securing employment in the industry is a legitimate goal, it is a reality that, ultimately, the labour needs of mines will change substantially. This will be a long-term process, but it is unavoidable. The mines of the future are unlikely to require large numbers of unskilled workers, but rather smaller, highly skilled, more flexible workforces.

> *A fundamental consideration in any discussion of the mining industry is the employment it generates. This is an important resource for the country, and maintaining it is a reasonable objective.*

This will require a steady skills pipeline. The mining industry is attempting to ensure this, in partnership in some instances with government. This is positive, and should be encouraged through long-term tax incentives. The goal should be to produce technical and vocational skills, and to support the higher-level innovation that will be necessary. An EED system would award points for doing this.

The displacement of workers as mining makes its transition is a process that South Africa should care about deeply. This will not only be disruptive to those whose positions become redundant – whether as a result of technological change or declining operational requirements – but will place additional strain on a society struggling with a chronic unemployment malaise and the associated problem of poverty.

Mustak Ally phrases the problem in these terms: 'We are downscaling in the current economic and policy environment. Coupled to this we have a high unemployment rate in society that needs to be labour intensive to ensure that unemployment can be curtailed. The challenge that then manifests, is to understand and implement a balanced approach to evolving to a mine of the future. How do we balance the need for technological solutions with the social impact? How do we upskill in this labour-intensive environment? How do we ensure that as labour demand declines in mining, we are able to create or seize opportunities elsewhere and in other economic sectors?'[120]

For Ally, the key to the response lies in the relationships that mining must develop with other parts of the economy. 'As we transition to a modern mining system, we are monitoring how people can be used in other parts of the economy. Think about a fitter and turner. Suddenly he/she loses their job on the mine. Can he/she take their skills and use them on an assembly line? We need to look at the skills foundations and see how they can be disbursed across industries.'[121]

The response for the mining industry is that it will need cooperation across industries and training institutions to try to cushion the social impact of any decline in mining employment, as well as supplying the skills that new forms of mining will require. No easy task, this will demand forethought, planning and experimentation in the decades ahead.

Labour relations

An evolving labour system must also seek to deal with the industry's turbulent labour relations. Violence and the loss of life in strikes in the industry are symptomatic of severe dysfunction. In the period immediately preceding the publication of this report, this was graphically illustrated by the violent AMCU-led strike at Sibanye-Stillwater. The strike – and the condemnations levelled at the union by the Labour Court – demonstrated the need for prudent union conduct.

While unions have the right (and the duty) to safeguard the interests of those they represent, hard questions need to be asked about how this is achieved and about the limits of what is possible. The financial difficulties faced by the industry demand such reflection on the part of all stakeholders. Indeed, in the Sibanye-Stillwater case, the various other unions involved – the National Union of Mineworkers, Solidarity and the United Association of South Africa – appeared to recognise these limits.

The use of violence to press demands is entirely unacceptable and the country can afford neither prevarication on the part of union leadership about it, nor ineffective state responses when it occurs.

One possible avenue to help align labour relations with the demands of the industry's continued viability would be to consider giving some legislated teeth to the recently introduced code of good practice for strike action. It is advisory, but makes some compelling recommendations concerning balloting before strikes and rules regarding picketing.[122] Appropriately considered and negotiated, parts of the code might make a valuable contribution to tempering the pathologies in the labour relations system without sacrificing the essential rights that unions are meant to protect.

> *The use of violence to press demands is entirely unacceptable and the country can afford neither prevarication on the part of union leadership about it, nor ineffective state responses when it occurs.*

Repairing the business environment

Attending to the regulatory hindrances besetting mining is necessary, but it is unlikely to be sufficient for a revival of the industry's fortunes. Much in the broader governance and societal ambit has a bearing on the industry, contributing to the costs of operations, and the desirability of undertaking operations in South Africa. The country's infrastructural failings are of great concern. Unattended, they could prevent a turnaround for the industry, if not accentuate its decline.

In certain areas, incentives may be provided to the industry to assist it in taking up responsibilities that have typically been seen as belonging to government. Tax incentives for providing electrical generation would be an example, for the use of mines and perhaps also for surrounding communities (again, something that EED would encourage).

But this has its limits. Infrastructure provision – or education, healthcare and so on – is not the core business of mining. It can make a helpful contribution and it can partner with other businesses, with civil society and with government to do so, but the heavier this burden, the greater the disincentive to operate in a given market.

Beyond this, business in South Africa faces challenges that stem from the choices that government has made. At the time of writing of this report, proposals from the ruling party to amend the constitution and to embark on a process of expropriation without compensation (ostensibly to expedite land reform, although the compensation requirements have never been shown to have been a problem) have done considerable damage to the country. It is unlikely that implementing this idea will be well received. For the mining industry, this does not appear to have registered as a major concern. It may in the future – and in any event, a depressed business climate will not be attractive for any investment.

Perhaps more importantly, such a climate will find it difficult to take advantage of the benefits of any mining investment. Government should desist from making such imprudent choices.

There is no real substitute for an improvement in the manner in which the country is governed and its infrastructure maintained. On government's shoulders rests the considerable responsibility of ensuring that the various elements of the broader economic and societal 'ecosystem' that enables business to flourish are kept up to minimum standards. This entails areas as diverse as education, healthcare, policing, roads, and electricity and water supply. The significance of a basic level of functionality and competence in the state (with standards hopefully rising over time) is all the more important when it is borne in mind that South Africa's authorities have consciously sought to retain such responsibilities for the state, and have often been suspicious of input from elsewhere. The time is at hand to deliver a 'developmental' performance.

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