Building trust, securing the future
A review of the Zambian mining sector

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Contents

Foreword

Few topics in Zambia evoke as much emotion and debate as the mining sector. People's expectations of what the sector can and should give back to the country are ever increasing, especially when commodity prices are high, as they are today.

In light of this, PwC Zambia has decided to take a closer look at the sector and the issues that both support and hinder industry development. In this report, the first of its kind by PwC Zambia, we present a broad range of sector analysis, from essential statistics to why trust has broken down among stakeholders and what can be done about it.

By presenting all this information in one place, we hope to help stakeholders better understand the industry and encourage greater participation in the sector's development.

I would like to take this opportunity to acknowledge and thank the following for their input:

- The Ministry of Mines and Minerals Development
- The Ministry of Finance and National Planning
- The Zambia Revenue Authority
- The Zambia Development Agency
- The Zambia Statistics Agency
- The Bank of Zambia
- The Zambia Extractive Industries Transparency Initiative
- The Chamber of Mines

I would also like to acknowledge the members of staff at PwC Zambia that have contributed to the preparation of this publication. A special thank you also to Colin Becker, Moise Ayaba and Richard Ansong, PwC Partners in Chile, the Democratic Republic of Congo and Ghana respectively for their perspectives.

We look forward to receiving your feedback.

Andrew Chibuye
Country Senior Partner

Introduction

Mining is the backbone of Zambia's economy. How the mining sector performs therefore has a huge impact on the country's overall economic fortunes. This has been witnessed recently where the global commodities boom has, to a degree, offset the economic woes caused by Covid-19 and the country's debt default in November 2020.

The United Party for National Development (UPND) government came to office in August 2021 on the back of its promise to revive Zambia's struggling economy. The 'New Dawn' government's strategy relies on maximising the mining sector's contribution to the economy to achieve this. The new government's goals for the mining sector include:

- Increasing copper production to three million tonnes per annum within 10 years.
- Diversifying the economy away from copper mining as the mainstay of the mining sector and the broader economy.
- Reforming the mining tax and administration policy environment.
- Promoting a competitive, stable and predictable policy environment.
- Enhancing the monitoring mechanisms to determine the volume and content of minerals extracted.
- Promoting and supporting small-scale mining.
- Increasing local ownership in the sector.
- Enhancing local participation in the mining value chain.
- Ensuring security of property rights for investors.
- Securing adequate energy supply for the sector to support existing and projected growth.

Unfortunately, inconsistency in mining policy and regulation under previous governments has undermined confidence in the sector. The new government will need to establish a stable policy regime and address the other issues undermining sector growth if it is to rebuild trust and attract new investment.

Overview of the mining sector in Zambia

The mining sector's performance can be analysed in the context of various performance indicators. These include overall production and revenue generated, contribution to gross domestic product (GDP) and tax collections, employment, and foreign direct investment (FDI).

In this section, we look at the sector's performance in terms of these indicators. Where possible, the sector's performance has been benchmarked against that of other countries for comparison. Given Zambia's reliance on mining specifically copper, Chile and the Democratic Republic of Congo (DRC) – both of which are major copper producers – have been used for comparison purposes.

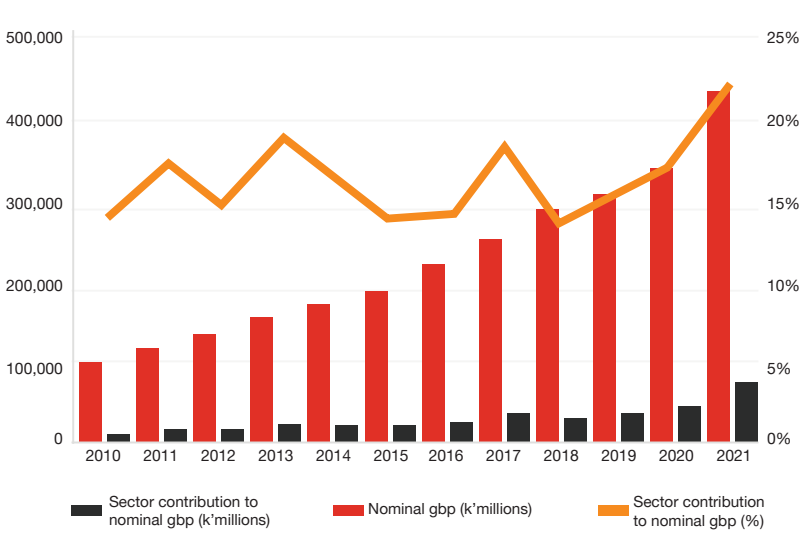
i. Contribution to GDP [1]

Mining is the largest sector of Zambia's economy as measured by its contribution to GDP. Below is a historical analysis of the sector's contribution based on figures from Zambia's Ministry of Finance and National Planning:

Table: 1

Year	Nominal GDP (K'millions)	Sector contribution to nominal GDP (K'millions)	Sector contribution to nominal GDP (%)
2010	97,215.9	10,859.7	11.2
2011	114,029.7	15,783.3	13.8
2012	131,271.9	16,201.1	12.3
2013	151,330.8	22,632.7	15.0
2014	167,052.5	21,732.9	13.0
2015	183,381.1	20,584.8	11.2
2016	216,098.1	25,310.9	11.7
2017	246,251.8	35,882.4	14.6
2018	282,423.5	29,871.0	10.6
2019	300,448.7	35,822.7	11.9
2020	332,223.2	44,144.7	13.3
2021	424,453.4	73,324.1	17.3

Figure 1: Mining sector contibution to GDP (K'million/%)



Source: PwC analysis

If we compare the contribution of the mining sector to GDP in Zambia with other major mining countries, we can see how reliant Zambia is on mining.

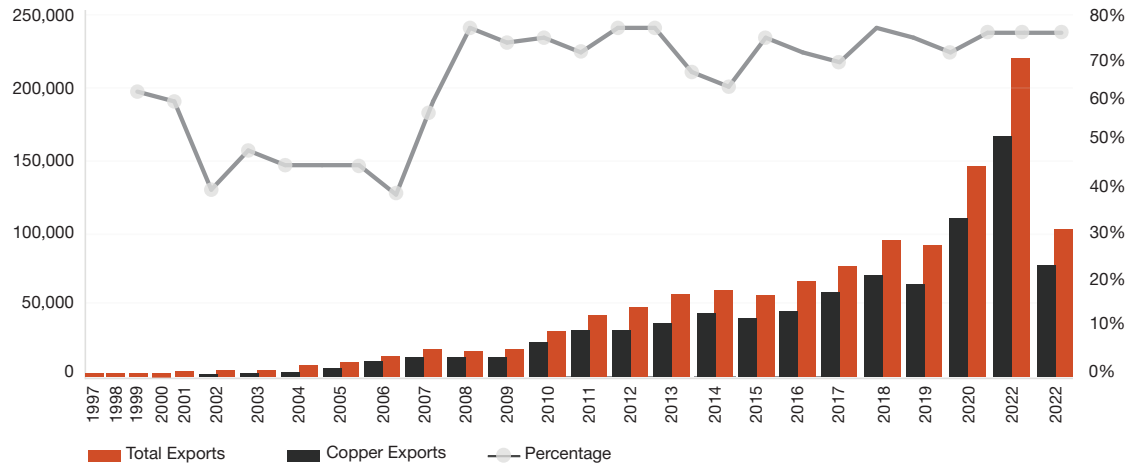
The World Bank assesses how dependent a country is on mining by analysing mineral rents as a percentage of GDP [2]. Mineral rents are the difference between the value of production for a stock of minerals at world prices and their total costs of production. Minerals included in the calculation are tin, gold, lead, zinc, iron, copper, nickel, silver, bauxite, and phosphate.

For 2020, Zambia's estimated mineral rents as a percentage of GDP was 9.71%. For major copper mining countries like Chile and the DRC, mineral rents were 6.12% and 17.85% respectively. Appendix 1 shows the global chart as compiled by the World Bank. Comparatively, mining in Zambia generates a larger proportion of GDP than most other major mining jurisdictions.

ii. Copper exports as a percentage of total exports [3]

Analysing exports is another way of helping us understand the role mining plays in Zambia's economy. Figures show that over the five-year period to the end of 2021, copper exports accounted on average for 74% of total exports. This represents a significant proportion of the country's total exports.

Figure 2: Copper exports vs total exports (K'millions)

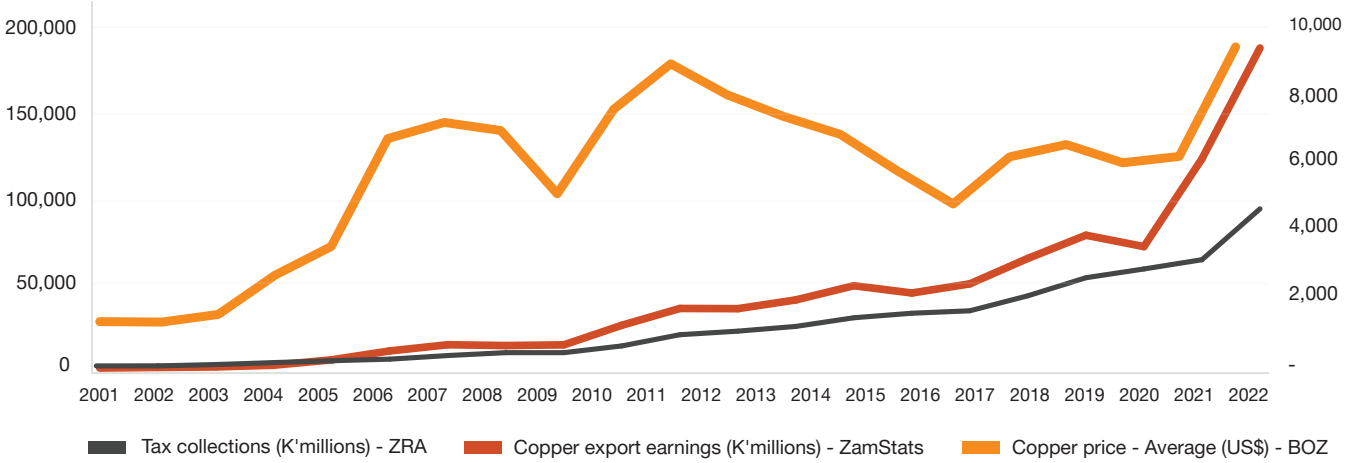


Source: PwC analysis

iii. Contribution to tax collections [4]

Another critical measure of the sector's contribution to the economy is the percentage of domestic taxes collected generated by mining. Figures published by the Zambia Revenue Authority (ZRA) show that mining is the largest contributor to the treasury, accounting for 47% of total taxes paid in 2021. This trend has been consistent for many years. Factors such as high copper prices and the impact of currency depreciation over the years have amplified mining's contribution to tax revenues.

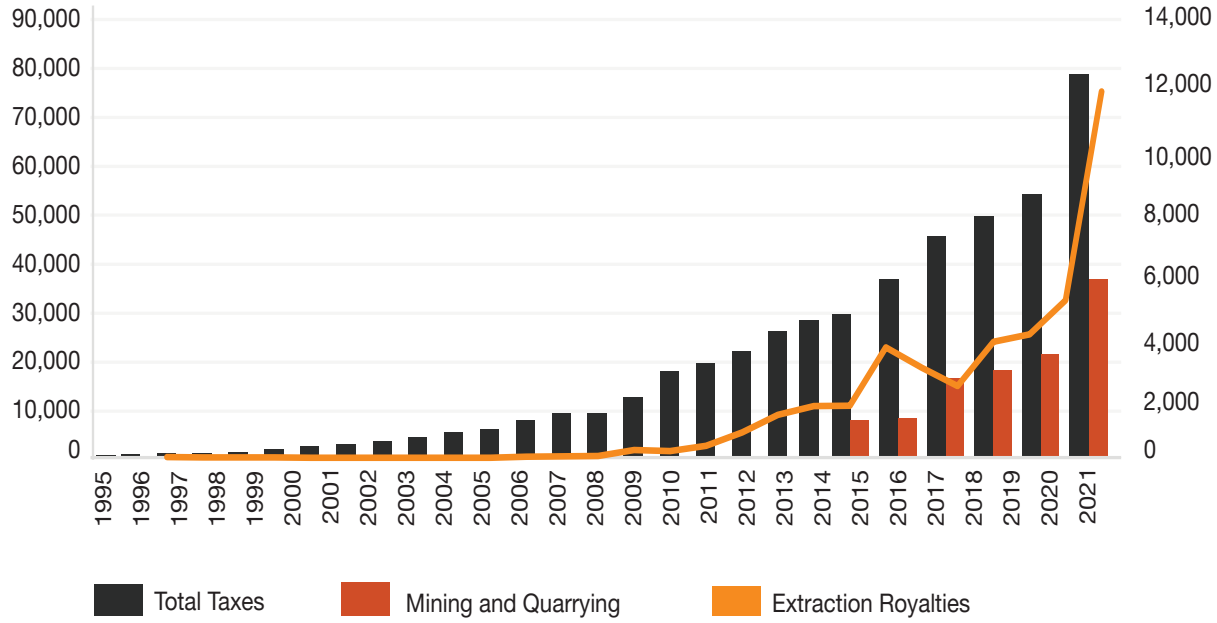
Figure 3: Mining tax statistics



Source: PwC analysis

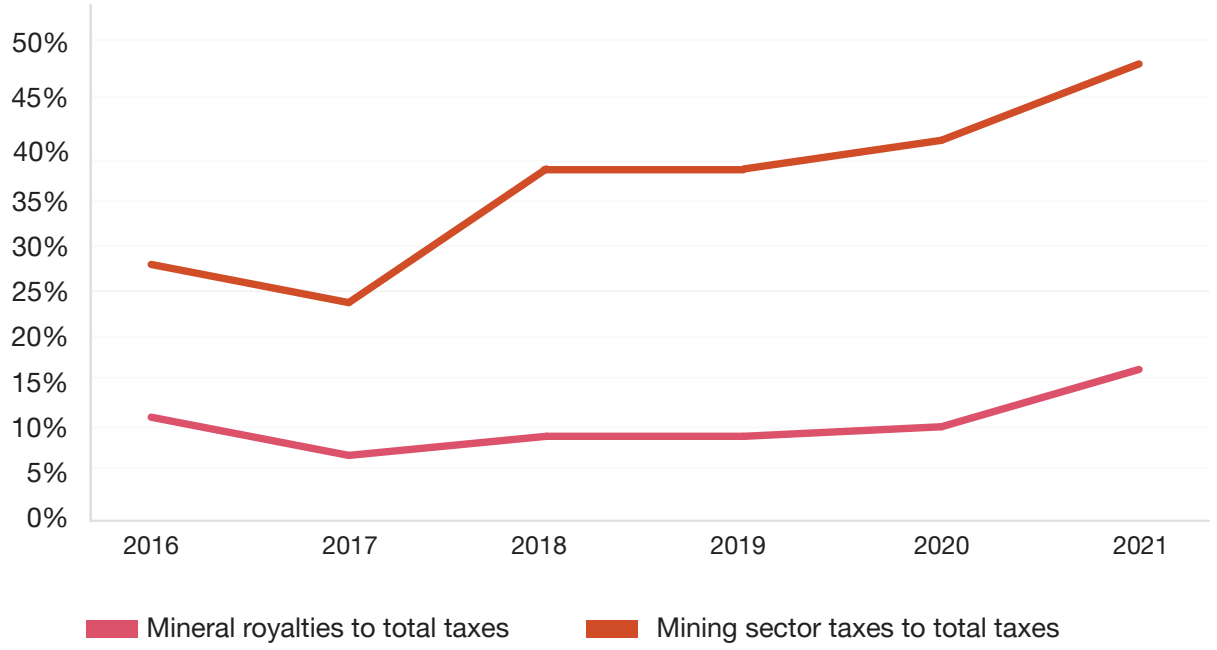
Figures from the ZRA between 2016 and 2021 confirm that the sector has contributed significantly to total annual tax collections, with the contribution growing proportionally over time.

Figure 4: Mining sector contribution to total taxes collected (K'millions)



Source: PwC analysis

Figure 5: Percentage of mining taxes to total taxes



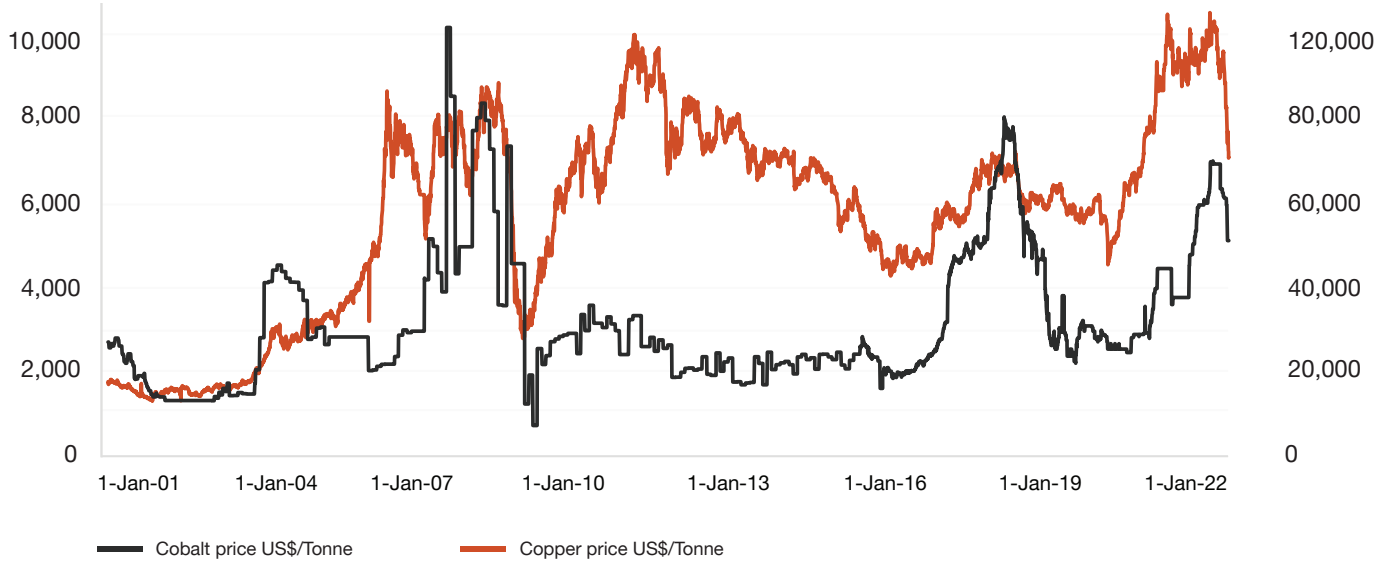
Source: PwC analysis

*Data for mining and quarrying as a consolidated sector was available from the ZRA from 2016. Mineral royalty data was available from 1995.Percentage of mining taxes to total taxes

iv. Commodity prices [5]

Prevailing commodity prices determine how the mining sector performs. Statistics compiled by the Bank of Zambia for the period from January 2001 to July 2022 show that prices of copper and cobalt have fluctuated over the period.

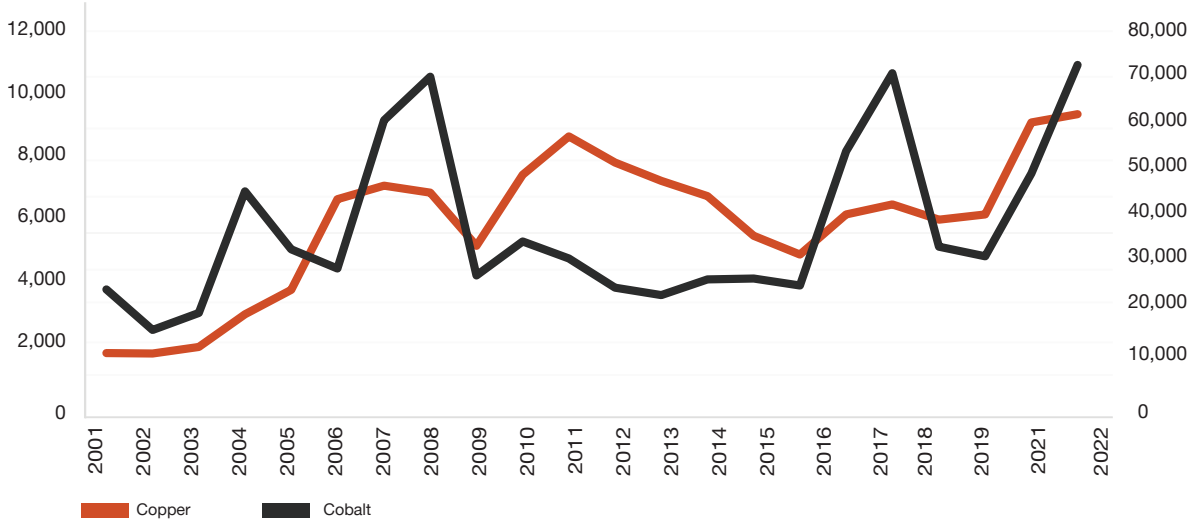
Figure 6: Daily Copper and Cobalt prices January 2001 to July 2022



Source: PwC analysis

Analyses of annual average prices indicate that, although volatile prices remained below US$6,000 per tonne for a sustained period between 2009 and 2016, in the last few years, prices have rebounded strongly. However, 2022 has seen prices fall from their all-time highs.

Figure 7: Annual average copper and cobalt prices January 2001 to July 2022



Source: PwC analysis

Table: 2

Statistic	Copper	Cobalt
Price (US$/MT): 15 July 2022	7,191	60,445
Price (US$/MT): 21-year high (2001 to July 2022)	10,674	120,393
Date: 21-year high (2001 to July 2022)	4-Mar-22	23-Jul-07
Highest 21-year annual average – Year	2021	2018
Highest 21-year annual average – Price (US$/MT)	9,288	72,935
Lowest 21-year annual average – Year	2001	2002
Lowest 21-year annual average – Price (US$/MT)	1,578	15,634

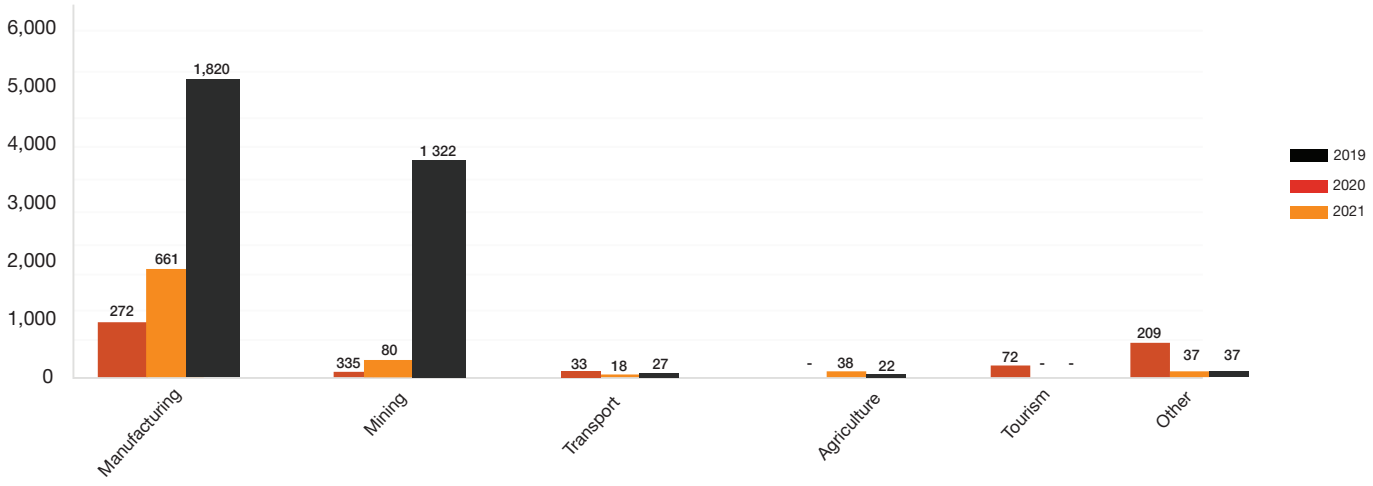
Source: PwC analysis

v. Share of recorded investment [6]

For the three years from 2019 to 2021, the mining sector recorded the second largest investment inflows as reported by the Zambia Development Agency in their annual reports. The sector trailed only the manufacturing sector.

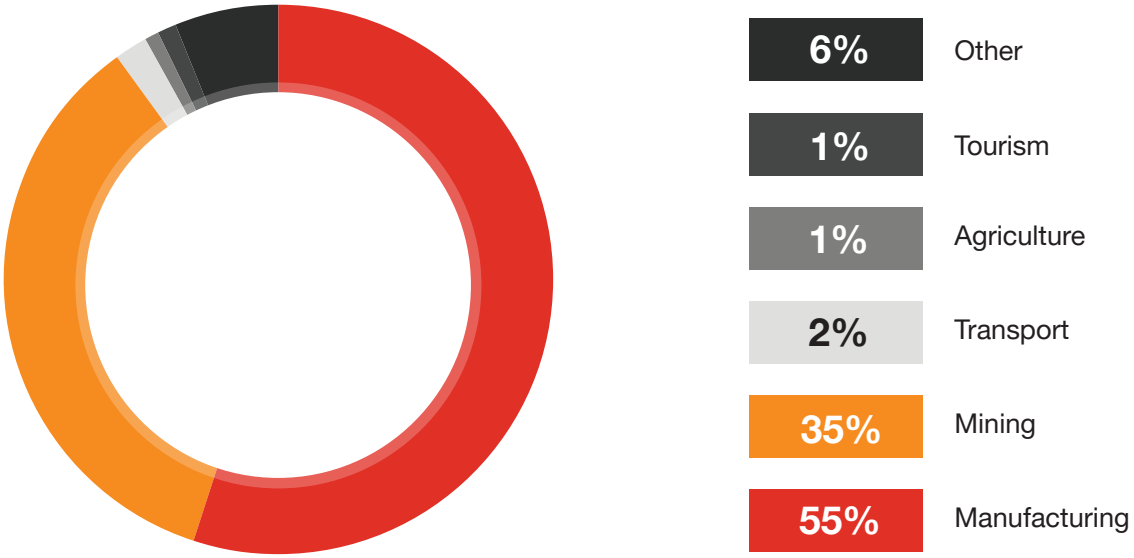
Recent announcements, such as First Quantum Minerals Limited's expansion of the Kansanshi mine and the development of the Enterprise Nickel mine, are likely to see an increase in the amounts invested in the mining sector. Overall, investment is expected to grow significantly in the near term as various projects are actualised across the different sectors.

Figure 8: Annual Investment recorded by ZDA US$'million



Source: PwC analysis

Figure 9: 2019 – 2021 proportional investment recorded by the ZDA

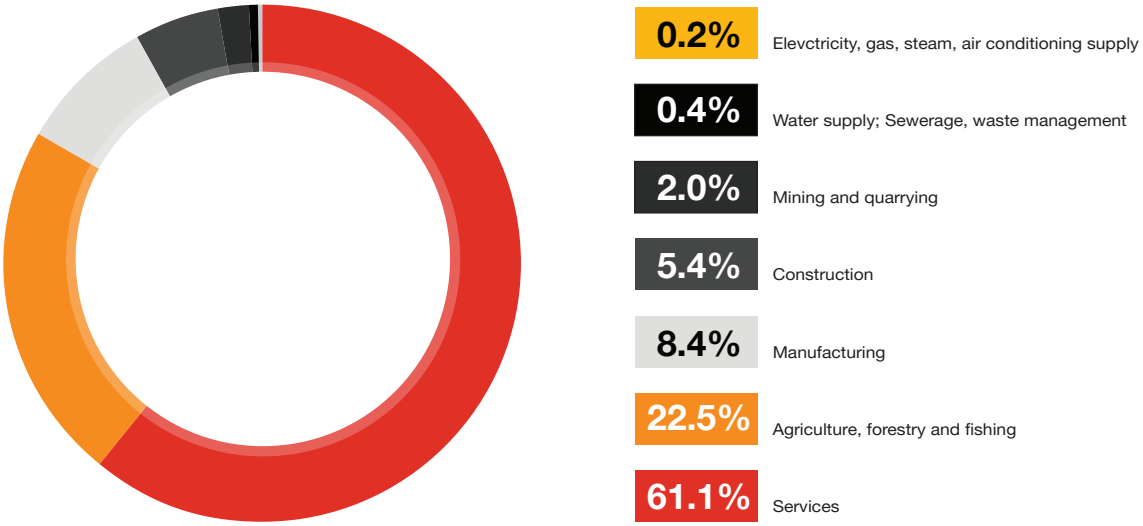


Source: PwC analysis

vi. Mining sector employment [7]

The mining sector employs only 2% of the country's total labour force. Mechanisation of the industry and the use of technology means that the mining sector is more efficient than most other sectors in terms of productivity, which is why employment by the sector is relatively low.

Figure 10: Zambia Statistics Agency 2020 labour force survey



Source: PwC analysis

vii. Dividends received [8]

The Zambian government's investments in mining assets are held through its stake in ZCCM Investments Holdings (ZCCM). Based on the annual reports published by the company, the investments held and dividends generated are listed in the below table. This publicly disclosed information does not provide an analysis of dividends received from each investee company separately. The period covers the financial years 2008 to 2019. The total dividends received amounted to K2 billion during this period. Appendix 2 provides details.

Table: 3

Investment	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019(Mar)	2019 (Dec)
Number of subsidiaries owned	2	2	2	1	1	3	5	5	5	6	5	5	7
Number of associates invested in	3	3	3	4	5	6	6	6	6	6	7	8	8
Dividends received (K million)	29,167	39,130	25,403	159,513	79,708	305,481	803,013	45,065	48,782	41,330	199,841	133,323	122,536
Number of companies paying dividends	3	2	1	4	4	4	2	3	2	1	2	2	1

Companies that paid dividends	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019(Mar)	2019(Dec)
	K/US$ M	K/US$ M	K/US$ M	K/US$ M	K/ US$ M	K/US$ M	K/US$ M	K/US$ M	K/ US$ M	K/ US$ M	K/US$ M	K/US$ M	K/US$ M
Kansanshi Mining Plc	-	US$ 3 m	-	US$ 34 m	K 39 m	K 196.7 m	K 795.4 m	K 22.6 m	K 11.9 m	N/A	K 149.1 m	K 44.8 m	K 122.5 m
Copperbelt Energy Corporation Plc	US$ 2.44 m	US$ 2.4 m	K 25.4 m	US$ 1.6 m	K 12.2 m	K 11 m	-	K 17.9 m	K 36.9 m	K 41.3 m	K 50.7 m	K 88.5 m	-
CEC Africa	-	N/A	-	-	-	-	-	-	-	N/A	-	-	-
Chibuluma Mines Plc	US$ 0.55 m	N/A	-	US $1.2 m	K 20 m	K 15.2 m	K 7.6 m	K 4.5 m	-	-	-	-	-
Konkola Copper Mines	US$ 1.39 m	N/A	-	-	K 8.5 m	K 82.6 m	-	-	-	-	-	-	-

Investment	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019(Mar)	2019 (Dec)
NFC Africa Mining Plc		N/A	-	US$ 3 m	-	-	-	-	-	-	-	-	-

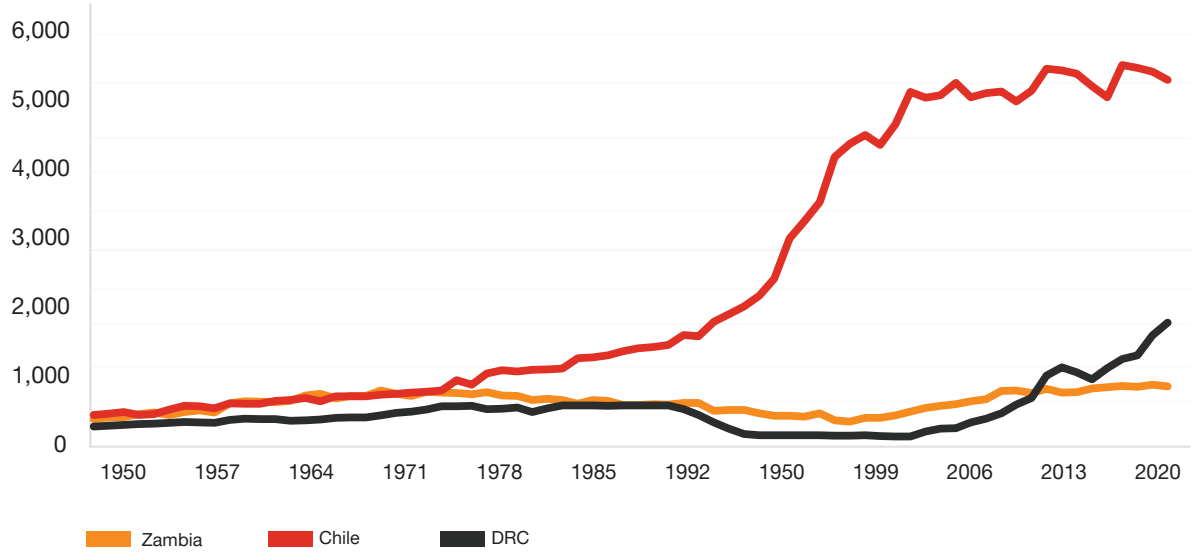
Source: PwC analysis

viii. Mining production output [9]

To better understand the state of the sector, a comparison of its performance and contribution to the economy relative to that of other countries is useful.

Copper is Zambia's main export and remains a dominant part of the sector's output. An analysis of copper output over an extended period shows that Zambia's output has progressively lagged that of other major producers such as Chile and the DRC. It is noteworthy that copper production for the three countries was almost identical prior to Zambia's independence. While the circumstances of each country differ in terms of resource endowment and resource grades, Zambia has not made significant headway with regards to increasing copper production. The announcement in last year's budget speech by the Minister of Finance and National Planning, Hon Dr Situmbeko Musokotwane, that Zambia wants to increase copper output to three million metric tonnes per annum seems a tall order. However, even if this target might be overly ambitious, there is potential to increase production significantly.

Figure 11: Annual Cooper output for Zambia vs Chile vs DRC (MT'000)



Source: PwC analysis

According to the 2021 World Copper Factbook published by the International Copper Study Group [10], two of the world's top 20 copper mines by processing capacity are in Zambia. Chile has the most in the world (seven), followed by Peru (four).

A summary of the top 20 copper mines by capacity by country is as follows:

Table: 4

Country	Number of mines in top 20	Capacity ('000 MT)
Chile	7	3,929
Peru	4	1,650
United States	2	800
Indonesia	1	700
Zambia	2	640
Mexico	1	525
Russia	1	450
Panama	1	350
DRC	1	300

Source: PwC analysis

In the coming years, the DRC is expected to grow its capacity significantly as the Kamoa-Kakula mine ramps up production. The project is a joint venture between Ivanhoe Mines (39.6%), Zijin Mining Group (39.6%), Crystal River Global Limited (0.8%) and the Government of the DRC (20%). Ivanhoe Mines expects it to become the world's second largest copper mine, with production of 800,000 metric tonnes per annum projected. Its ore grades, which average 4.47%, make it one of the world's highest-grade copper deposits identified.

The International Copper Study group's top 20 list is as follows [10]:

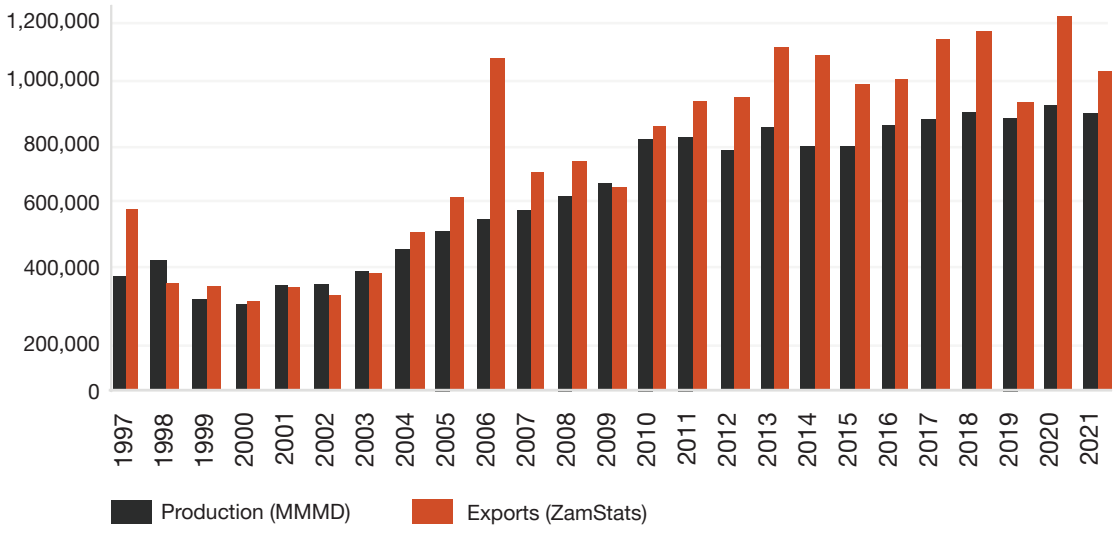
Table: 5

Rank	Mine	Country	Owner(s)	Capacity ('000 MT)
1	Escondida	Chile	BHP Billiton (57.5%), Rio Tinto Corp. (30%), Japan Escondida (12.5%)	1,510
2	Grasberg	Indonesia	PT Freeport Indonesia (PT Inalum and the provincial/regional government 51.2% and Freeport-McMoRan Inc 48.8%)	700
3	Collahuasi	Chile	Anglo American (44%), Glencore plc (44%), Mitsui (8.4%), JX Holdings (3.6%)	610
4	Buenavista del Cobre (Former Cananea)	Mexico	Grupo Mexico	525
5	Morenci	United States	Freeport-McMoRan Inc 72%, 28% affiliates of Sumitomo Corporation	520
6	Cerro Verde II (Sulphide)	Peru	Freeport-McMoRan Copper & Gold Inc. 54%, Compañia de Minas Buenaventura 19.58%, Sumitomo 21%	500
7	Polar Division (Norilsk/ Talnakh Mills)	Russia	Norilsk Nickel	450
8	Antamina	Peru	BHP Billiton (33.75%), Teck (22.5%), Glencore plc (33.75%), Mitsubishi Corp. (10%)	450
9	Las Bambas	Peru	MMG (62.5%), Guoxin International Investment Corporation Limited (22.5%), CITIC Metal Co., Ltd. (15%)	400
10	El Teniente	Chile	Codelco	399
11	Los Pelambres	Chile	Antofagasta Plc (60%), Nippon Mining (25%), Mitsubishi Materials (15%)	370
12	Chuquicamata	Chile	Codelco	360
13	Cobre Panama	Panama	First Quantum Minerals Ltd 90%, Korea Panama Mining Corp. (LS-Nikko Copper Inc. and Korean Resources Corporation) 10%	350
14	Kansanshi	Zambia	First Quantum Minerals Ltd (80%), ZCCM (20%)	340
15	Los Bronces	Chile	Anglo American 50.1%, Mitsubishi Corp. 20.4%, Codelco 20%, Mitsui 9.5%	340
16	Radomiro Tomic	Chile	Codelco	340
17	Kamoto	Democratic Republic of Congo	Katanga Mining Ltd (86.33% Glencore plc) 75%, Gécamines 25%	300
18	Sentinel	Zambia	First Quantum Minerals Ltd	300
19	Toromocho	Peru	Chinalco	300
20	Bingham Canyon	United States	Kennecott	280

viii. Copper production vs copper exports [3.9]

An analysis of production figures compiled by the Ministry of Mines and Minerals Development (MMMD) and export statistics compiled by the Zambia Statistics Agency (ZamStats) was performed for the period 1997 to 2021. It shows that mines consistently declared greater export volumes than they did production. Over the period, export volumes of 17,338,890 metric tonnes exceeded declared production of 14,404,201 metric tonnes by 2,934,689 metric tonnes. Exports exceeding copper production is mainly due to copper concentrate being imported from the DRC for smelting before being exported.

Figure 12: Copper Production vs Copper Exports(MT)



Source: PwC analysis

ix. Mineral reserves [11]

The sector's prospects are linked closely to the level of mineral reserves the country currently possesses. The below table shows estimates of Zambia's reserves of copper, cobalt, nickel, gold, manganese and emeralds in relation to global reserves as per the US Geological Survey:

Table: 6

2021	Zambia			Global total			Leading producer - Global			Leading producer - Africa		
Mineral	Unit	Production	Reserves	Global rank	Production	Reserves	Zambia rank	Country	Production	Reserves	Country	Production	Reserves
Copper	MT'000	803	21,000	7	21,000	880,000	10	Chile	5,600	200,000	DRC	1,800	31,000
Cobalt~	MT'000	0.231	NA	NA	170	7,600	NA	DRC	20	3,500	DRC	120	3,500
Nickel	MT'000	NA	NA	NA	2,700	>95,000	NA	Indonesia	1,000	21,000	NA	NA	NA
Gold	MT	NA	NA	NA	3,000	54,000	NA	China	370	2,000	Ghana	130	1,000
Manganese	MT	N/A	NA	NA	20,000	1,500,000	NA	South Africa	7,400	640,000	South Africa	7,400	640,000
Emeralds**	Kg	12,871											

Source: PwC analysis

1 NA - Not available

2 ~Zambia's production figures obtained from the MMMD.

3** Emerald production figures obtained from the MMMD. As noted in the research paper entitled Global Emerald & Ruby Supply: Analysing Market Data, authored by Lauriane Pinsault of Gemfields, data is lacking on global coloured gemstone production. This problem is amplified by the fact that a significant proportion of the gemstones produced come from artisanal mining that is both formal and informal and for which there are no reporting standards (superscript 12).

Summary of mining sector facts and figures:

Table: 7

Year	Measure	Statistic	Source
2021	Contribution to GDP	17.3%	Ministry of Finance and National Planning
2021	Percentage of exports	75%	Zambia Statistics Agency
2021	Contribution to total taxes collected	47%	Zambia Revenue Authority
2020	Contribution to total employment	2%	Zambia Statistics Agency
2021	Investment	US$ 1.32 billion (41%) of investments recorded through ZDA	Zambia Development Agency
2019 (9 months to December 2019)	Total annual dividends received by ZCCM in the period	K122,536,000	ZCCM IH annual report
2008 (January) to December 2009	Total dividends received in 12 years	K 2,032 million K 1,520 million dividends received from Kansanshi Mining Plc K 1,709 million received by ZCCM IH excluding amounts from CEC Plc	ZCCM IH annual report
2021	Copper production in MT	804,000	Ministry of Mines and Mineral Development
2021	Average copper price/ MT	US$9,288	Bank of Zambia
2021	Copper reserves	21 million tonnes	Ministry of Mines and Mineral Development

Source: PwC analysis

Trust: where did it go?

Who benefits most from Zambia's mineral assets is a subject that continues to fuel debate among stakeholders including government and its agencies, civil society and the people of Zambia, and the mining companies themselves. The debate has persisted throughout the tenure of successive governments.

Unfortunately, actions by various stakeholders over the years have led to a breakdown in trust between government, the mining companies and civil society. Here we assess some of the issues that have led to this breakdown of trust.

Government in the spotlight

Frequent changes made by successive governments to the mining sector's legal and regulatory regime have undermined investor trust in the sector. These changes have created an inconsistent and unstable investment environment, which is not conducive to the long-term investments mining needs.

i. Mining tax policy changes [13]

PwC Zambia has reviewed the mining tax policy announcements made by successive governments in their budget presentations. Over the 13-year period since 2008, several changes to mining tax policy were noted. Changes were made in eight broad areas, which are listed below:

Table: 8

No.	Area	Notable changes
1	Mining operations	2
2	Variable tax rate	4
3	Windfall tax	2
4	Capital allowances on capital expenditure	6
5	Carry forward of tax losses	4
6	Separate source income	3
7	Withholding taxes	1
8	Mineral royalties	9

Source: PwC analysis

Details of the tax changes are tabulated in Appendix 4. Not all changes may have been significant individually. However, the number of changes has meant that Zambia's tax and policy environment is considered unstable and thus not ideal for long-term investment.

ii. Other regulatory and policy changes

In addition to tax changes, there have been other policy changes that have affected the mining sector in different ways. Some have created uncertainty and instability in the policy environment. Notable announcements that have concerned the sector in recent years include:

Table: 9

No.	Regulation enactment	Comment
1	Statutory Instrument (SI) 33 of 2012, the Bank of Zambia (currency) regulation: SI 33 prohibited quoting in, paying, or receiving foreign currency as legal tender for goods, services, or any other domestic transactions.	Regulation was repealed in March 2014.
2	Statutory Instrument 55 of 2013, The Bank of Zambia (Monitoring of Balance of Payments) regulation: SI 55 required importers and exporters to operate and maintain foreign currency bank accounts locally. In addition, exporters were required to repatriate proceeds to Zambia within 120 days of their receipt.	Regulation was repealed in March 2014.
3	Sales tax proposed implementation: in the 2019 budget, read in September 2018, government proposed that a sales tax be implemented in Zambia to replace Value Added Tax.	The plan to implement the change was reversed in September 2019, a year after it was announced. In the intervening period, businesses had begun to take steps to ensure compliance at the implementation date.

iii. Abandoning the Development Agreements

The Development Agreements were documents negotiated between government and investors during the privatisation of ZCCM in the late 1990s. According to John Lungu's paper The Politics of Reforming Zambia's Mining Tax Regime [14], the agreements negotiated between 1997 and 2000 ensured tax stability for the mining companies for a defined period. Concessions were provided with the intention of boosting mining sector investment. However, it is important to note that the concessions were not without conditions. Targets regarding investment, employment creation, local procurement and social investment were articulated. However, after the agreements were signed, many stakeholders including civil society criticised the agreements for being unfavourable to Zambia.

In his budget speech for the year 2008, read on 25 January 2008, the Honourable Minister of Finance at that time, Ng'andu Magande, announced a raft of measures that effectively negated the Development Agreements [15]. This meant that commitments made by government would not be adhered to. Although the agreements were not without controversy, government's decision to do away with them as they did eroded trust in the mining companies and their investors.

iv. Zambia's sovereign debt default

Government's default on its Eurobond debt repayments in November 2020 is the most significant issue to affect Zambia's economy in recent years. The default stemmed from several years of high spending on infrastructure and other projects, which saw the previous government accrue unsustainable levels of debt. The implication of the default has been far-reaching.

It is expected that emerging market economies like Zambia carry with them an elevated risk premium for investors. Perceived political risk also increases the return demands of companies who invest in countries like Zambia. The country's debt default means that both these risks have been amplified.

Zambia's credit rating was downgraded to default status by the major credit rating agencies following the default. This in turn has hindered the country's ability to attract new investors and has deterred many existing investors from investing more money in the country.

The new UPND government has made significant progress in restoring Zambia's credit worthiness by engaging the International Monetary Fund (IMF) to help it negotiate debt restructuring with creditors [16]. On 31 August 2022, the IMF's Executive Board considered and approved Zambia's request for an Extended Credit Facility. The 38-month US$ 1.3 billion programme is intended to help restore debt sustainability, create fiscal space for much-needed social spending, and strengthen economic governance [17]. Negotiation with external creditors is still ongoing and is essential to securing the successful implementation of the programme. It is expected that once debt restructuring is concluded Zambia's credit rating will be upgraded.

v. Security of tenure issues

Security of tenure in the form of mineral rights for designated exploration or mining activity is crucial for the long-term sustainability of the sector. However, concerns have been raised regarding the transparency and integrity of the process with which mineral rights are issued. The Honourable Minister of Mines and Minerals Development, Paul Kabuswe, MP, announced in February 2022 that the internal audit unit of the ministry had commissioned an audit of the mining cadaster department, the department responsible for issuing mining licenses [18]. Although the full results of the audit have yet to be made public, Hon Kabuswe has indicated that various anomalies were discovered.

According to Hon Kabuswe, anomalies discovered include inequity in the process of issuing licenses, which has enabled some license holders to hold several licenses, ambiguity regarding ultimate ownership of license holders, and allegations of fraud and corruption in the license issuance process. These discoveries have impaired trust in government's administration of the sector.

Mines in the spotlight

Various issues have been raised by government, its agencies, civil society and the community in general with regards to the mining industry in Zambia. Here we discuss some of the issues raised.

i. A perception that the mining sector should contribute more to the country

- Contribution to the country in this case refers to:
- Greater tax revenues.

Investment returns such as dividend income on shares held in mining assets.

As highlighted in Section 2, Zambia's mining sector is the largest contributor to total taxes collected and export earnings. It is also a major contributor to GDP. However, some stakeholders question whether this is enough.

According to the ZRA, the level of compliance by the sector suggests there may be some valid concerns as to whether all tax revenues due are being accounted for. In a presentation on tax matters made by ZRA Commissioner General Dingani Banda on 11 August 2022 to the Zambia Institute of Chartered Accountants, Mr Banda indicated that out of the 2,416 mines that are registered for tax (12 being large mines), only 171 small, medium and artisanal mines declared mineral royalties in 2021 [19].

While it is possible that some of the entities are inactive, a compliance rate of 7% (excluding large mines) is unusually low. Given that mineral royalties are levied on revenues generated and not on profits, this begs the question: why are so many mining companies not declaring royalties?

In addition to the non-compliance highlighted by the ZRA Commissioner General, questions arise about mining companies that are reported to have operated for many years generating minimal profits or mainly losses. As a result, minimal or no taxes have been collected from these companies. As most mining companies do not publish their results, it is not possible to ascertain objectively the validity of this assertion and to identify possible causes.

Regarding returns generated through dividend income, Zambia, through ZCCM, has interests in a portfolio of mines whose dividend performance is shown in table 6. Of the investee companies held, there are some that have not declared dividends in the period for which information is publicly available (2008 to 2019). There is limited information regarding dividends pre-privatisation. As such, it is difficult to compare the level of returns from the mining sector in the form of dividends prior to privatisation. In his paper The Politics of Reforming Zambia's Mining Tax Regime, John Lungu quotes a 2007 BBC interview with the Honourable Edith Nawakwi, the Minister of Finance at that time, who said the mines were generating losses of US$1 million daily under government ownership. The probability that dividends would have been received is therefore low [14].

ii. Production and export discrepancies

Transparency of production and exports appears to be an area of concern for mining sector stakeholders.

In a presentation made to a meeting of accountants in August 2022, the ZRA's Commissioner General said it had discovered discrepancies between the information on export declarations (mineral analysis certificates) of some mining companies and what ZRA determines as being the actual minerals being exported when shipments are inspected [19]. The differences between the documentation prepared by some mining companies against what border inspections reveal erode the credibility of the mining companies affected.

iii. Environmental impact of mines no longer in operation

In the post-privatisation period, some mines ceased to operate and shut down. Ensuring that the environment is remediated and that the environmental dangers of by-products like waste are managed effectively are fundamental to sustainable mining. According to the World Bank in its paper Zambia Mining and Environmental Remediation and Improvement Project (December 2020) [20], years of unsustainable mining operations and inadequate rehabilitation of mine sites have led to significant pollution. Townships on the Copperbelt that are adjacent to mine sites are severely polluted, while towns like Kabwe are afflicted by high levels of lead in the soil.

Although it can be argued that current mining operations may have had little to do with the environmental damage of the past, there are concerns that companies are not doing enough to ensure that adequate measures are being taken to safeguard the environment. Public reporting on the sustainability of operations is not currently required

iv. Corporate social responsibility programmes that benefit the communities

Historically, government had a close association with mining companies through ZCCM. The company was active in communities and provided various social services to the people in the areas it operated. Since privatisation, the role and impact of mining companies in their communities has evolved. Some companies have developed significant social programmes that have transformed the communities in which they operate. Others have not had the same impact.

v. Transfer pricing and base erosion and profit shifting by multinational corporations

It is not uncommon for mining multinational enterprises (MNEs) to have complex and opaque group structures which make it challenging for revenue authorities to ascertain whether parties to a transaction are related. It also makes it difficult to track the pricing of commodities sold on global markets between related entities within MNE groups. However, obtaining information on related parties based in offshore jurisdictions still poses a challenge for ZRA. Therefore because Zambia lacks access to information relevant to mineral commodity transactions it is difficult to fully appreciate MNEs' global presence and transactional profitability.

The perceived lack of transparency results in diminished trust, especially where MNEs do not generate profits for a prolonged period.

Mining sector realities

It is important to acknowledge that the mining sector has certain peculiarities that make it unique. Understanding these realities is important to ensure that all who have an interest in the sector make decisions that are optimal for the short, medium and long term.

i. Mining at scale requires significant capital investment

In May 2022, First Quantum Minerals Limited announced that it would be expanding its Kansanshi Mine in Zambia while also embarking on the development of its Enterprise Nickel Mine. The Kansanshi Mine expansion is expected to extend the life of the mine by 20 years, while the nickel project would lead to the establishment of one of Africa's largest nickel mines [21].

The combined investment is expected to be US$1.35 billion, with US$1.25 billion going towards the expansion of the Kansanshi Mine and US$100 million being invested in the Enterprise Nickel Mine. The total being invested represents approximately 4.88% of the country's 2021 GDP at current exchange rates. Other notable global projects have also demanded significant capital investment beyond the current capacity of Zambia's economy to generate.

Some examples of recent mining projects undertaken, and the cost guidance thereof is presented below. It should be noted that costs vary significantly depending on factors such as the location of the mine, the terrain and the nature of the ore body discovered, as well as the technologies needed to produce the minerals. It is worth observing that, at scale, even the lower end of the range in terms of investment required is significant for any economy.

Table: 10

Mine	Open pit/ underground	Developer	Country	Mineral (s) mined	Projected output PA	Development cost guidance	Source	Year of commercial production
Kamoa-Kakula	Open pit	Ivanhoe	Democratic Republic of Congo	Copper	800,000	US$1.3 billion (22)	Ivanhoe	2022
Oyu-Tolgoi	Open pit & underground	Rio Tinto	Mongolia	Copper	500,000	US$7.6 billion (23)	Rio Tinto	2013
Kansanshi - S3 expansion	Open pit	First Quantum Minerals	Zambia	Copper-gold	400,000	US$1.25 billion (21)	First Quantum Minerals	2025
Las Bambas	Open pit	Xstrata & MMG	Peru	Copper, molybdenum, gold & silver	300,000	US$7 billion (24)	Xstrata & MMG	2016

ii. The competition for capital is global

Only a handful of companies can mobilise the capital required to undertake large-scale projects. These global corporations often have several options when they are looking to invest. As such, competition among countries to attract the limited investment available for large projects is high.

In addition, emerging markets such as Zambia have an elevated risk premium. This is another hurdle for investors to consider before investing their capital in Zambia.

iii. Mining is a longer-term investment than most

Investing in mining is generally a long-term business. It is not uncommon for the process to take many years from prospecting for minerals all the way through to production and sales. Companies therefore need to take a long-term view when considering investing in the sector. Assumptions about production yields, commodity prices, exchange rates, inflation, energy prices and applicable taxes generate significant uncertainty over overall project returns.

Because of this longer time frame, it is possible that the business and operational environment will evolve significantly during the development period, rendering initial forecasts and estimates on which investment was made redundant. This could be positive or negative for the company.

iv. Industry cyclicality

Commodity-based businesses often experience cycles that see prices rise and fall over time, sometimes dramatically. Demand and supply, sentiment and expectations can lead to commodity price volatility. Consequently, the fortunes of mining can shift significantly from very favourable to significantly challenged, depending on the stage in the cycle.

v. Mining is a complex industry

Mining at scale is complicated. To mine at scale sustainably in today's environment, companies need to utilise advanced technology, which is expensive. Mining also employs a wide range of experts such as metallurgists, surveyors, process engineers, geologists and mining engineers, and is supported by appropriately qualified finance, human resource, technology and commercial staff. Assembling a team that possesses the right skills and expertise is expensive and sometimes requires the importation of specialists from other jurisdictions.

vi. Minerals are a wasting asset

Minerals are a finite resource. Because these resources are not renewable, it is essential that all those involved benefit optimally from the activity while it is ongoing. For mining companies and their shareholders, that means a return on investment. For governments and their citizens, the benefits include taxes, dividends and social development. Striking the balance is not an easy task.

vii. Environmental impact

The impact of mining on the environment is potentially significant. History shows that if mining is not undertaken in a responsible and sustainable manner, the effects can be catastrophic for the communities and wildlife that live around the mine. Some of the lasting effects of environmental pollution include damage to people's health and the wildlife that inhabit it, and loss of livelihoods.

It is therefore imperative that mining activity is undertaken in a responsible and sustainable manner to mitigate its adverse effects.

The importance of now: opportunity awaits

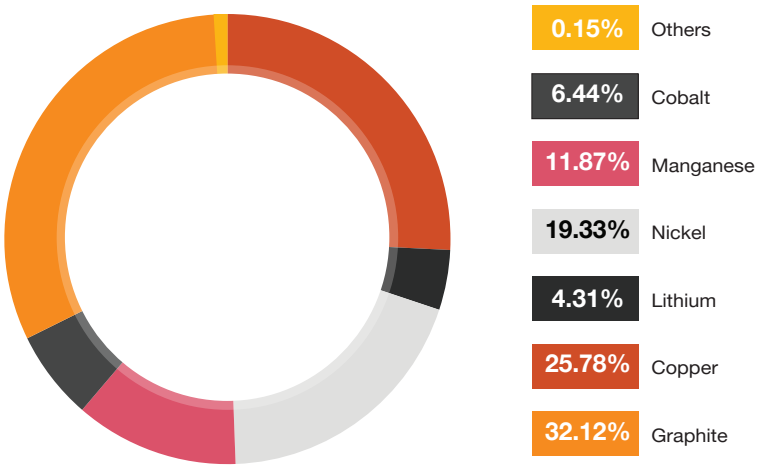
Despite the challenges, there are significant opportunities available to the mining sector. Favourable commodity prices and the drive by government to enhance the sector's output, both in terms of volume and through raw material value enhancement, are some of the main incentives for stakeholders to drive the industry forward.

i. The transition to clean energy technology

According to the International Energy Agency (IEA) in their report entitled The Role of Minerals in Clean Energy Transitions, clean energy technologies make use of more minerals than those required for fossil-fuelled technologies [25].

As an example, the IEA indicates that the average electric vehicle will be made up of the following minerals by mass, excluding steel and aluminium:

Figure 13: Electric vehicle composition



Source: PwC analysis

The world adopting cleaner technology should have a positive impact on the mining sector. These new technologies will increase demand during a period when commodity prices are expected to remain high. As shown in figure 6, commodity prices have been rising in recent years. In 2022, prices have fallen due to declining demand from China. However, market experts such as IHS Markit (part of S&P) expect demand to recover in the short term.

Zambia currently produces copper and cobalt, mainly as a by-product of the copper production process. Whereas copper production is quite significant for the country and global supply (7th largest producer with 3.8% of global output in 2021, according to figures from the US Geological Survey), the picture for other minerals like cobalt is not as robust. For example, in 2021, Zambia produced 231,000 tonnes of cobalt, which accounted for 0.14% of global output. The DRC, however, produced 3.5 million tonnes, accounting for 46% of global production.

The recent announcement by First Quantum Minerals Limited regarding the development of the Enterprise Nickel Mine is expected to make Zambia one of the largest producers of the metal in Africa. In a news release dated 8 May 2022, First Quantum Minerals Limited said the capital investment of US$100 million was expected to produce between 5,000 and 10,000 tonnes of Nickel in 2023 [21]. Indonesia, the world's biggest nickel producer in 2021, accounted for 1 million tonnes of the 2.7 million tonnes produced globally [11]. Regardless, given that the US produced 18,000 tonnes of nickel in 2021 and was ranked the 10th largest producer globally, Zambia stands a good chance of becoming a notable player in the supply of the commodity globally in a short space of time.

Trends regarding demand and pricing of these minerals are expected to provide long-term benefits to the mining companies involved in their extraction and, by extension, the country.

To take advantage of the electric vehicle era, in April 2022, Zambia and the DRC signed a memorandum of understanding to establish a partnership focused on taking advantage of the opportunities springing from the green revolution.

ii. Gemstone mining

Zambia has world-renowned gemstone resources and is one of the largest producers of emeralds in the world. The production and revenues generated by emerald mining over the five years to 2021, as reported by the United Nations Comtrade database, show a notable increase in output. According to a report prepared by Gemfields entitled Global Emerald and Ruby Supply: Analysing Market Data, Zambia's emerald sales mostly represent output from Kagem Minerals Limited and Grizzly Mining Limited [12].

iii. Incentives for beneficiation

A key objective of Zambia's new UPND government is to provide incentives to encourage local production, with a focus on growing exports. The government also wants to improve the level of raw material beneficiation to enhance the value of goods produced and exported from Zambia. In his 2022 budget speech, read on 29 October 2021, the Minister of Finance and National Planning, Hon Dr Musokotwane, introduced tax incentives for companies that set up in the country's multi-facility economic zones, with an emphasis on export companies [26]. These incentives are not restricted to the mining sector and the mining value chain but can be taken advantage of by the sector.

Corporate income tax incentives announced for these zones include:

- 0% for a period of 10 years from the commencement of works.
- Tax on 50% of profits generated from the 11th to 13th year.
- Tax on 75% of profits generated in the 14th and 15th years.

The incentives are available for any investor.

iv. Small-scale mining

Large-scale mining requires significant investment often not available to the domestic market. However, there are some small-scale mineral resources that have been identified. Small copper reserves in different parts of the country could provide locals with the opportunity for greater participation in mine ownership.

How to rebuild trust

Having assessed the state of Zambia's mining industry, how do we go about rebuilding trust in the sector, particularly between government and the mining companies? Rebuilding trust is crucial if the sector's full potential is to be realised.

Government's perspective

The government's main aim is to attract the amount of investment into the mining sector needed to spur economic activity and growth. This is irrespective of whether that investment is foreign or local. The United National Conference on Trade and Development in 2011 published a paper entitled Best Practices in Investment for Development, How to Attract and Benefit from FDI in Mining: Lessons from Canada and Chile [27]. The paper provides a useful framework that can be used as a benchmark when assessing the current state of affairs.

Broadly, two themes were defined based on the study undertaken:

14. Geological potential, including the level of publicly available geological data. Other factors that influence whether a mine can exploit a deposit profitably include:

- Infrastructure, such as transport, water and electricity, all of which are important to the mineral production process.
- Availability of skilled labour, such as mining technicians, engineers and managers.

15. Profitability determinants relating to policy and institutional factors, including:

- Political stability and quality of governance, including the likelihood of unexpected policy and regulatory changes, and the clarity and enforcement of regulations.
- FDI legislation and policy, including protection and treatment of foreign investors, as well as the ability to repatriate profits.
- The nature and security of mining concessions or titles.
- The level of taxation, but also its structure.
- The level and clarity of environmental and social regulatory obligations.

Some of the factors identified were selected and evaluated as matters to be considered to enhance government trust.

i. Policy stability and predictability

Policy stability and predictability is one of the main issues that government needs to address to rebuild trust in the sector. One challenge is that each new government makes changes to mining sector policy when it comes to power. A long-term policy framework is required to stop this happening. The project-life of a mine can easily exceed the tenure of a government. Therefore, a more consistent, stable policy regime is needed if these investments are to be maximised to the benefit all stakeholders.

A comprehensive review of the policy environment with input from all stakeholders is needed to establish this framework. Such a framework, if developed with widespread consultation and supported by appropriate quantitative and econometric data to back policy positions, is much more likely to stand the test of time.

The Mines and Minerals Act is currently undergoing review and it is essential that this review is done comprehensively with the long-term objectives and prospects for the sector considered. A core aspect of the policy environment is its ability to stimulate greater investment in the sector. This is, in effect, the competitiveness of the policies developed. This is important because as discussed earlier countries compete for investment capital for large-scale projects.

ii. Regulatory oversight

There have been calls from stakeholders for the regulation and supervision of the mining sector in Zambia to be enhanced. This is to improve the oversight of the sector, especially with regards to small and medium-sized miners.

It is also acknowledged that given the complexity of the industry it might be useful to establish a special agency separate to the MMMD to oversee certain parts of the sector. Such an agency would offer reassurance to government and stakeholders that important matters concerning the industry are being addressed.

Parallels are drawn with other complex industries, such as banking, insurance, telecommunications and energy, which all have dedicated regulatory agencies in addition to the government ministries that oversee them. Irrespective of whether there is a separate agency or supervision is undertaken by a government department, adequate knowledge, skills, experience and technology are needed to better monitor the sector.

Added regulatory and oversight capacity would allow a dedicated government agency to focus on those entities that are non-compliant. This would reduce the focus on the large mines, which currently carry most scrutiny, and lessen government's appetite to change existing laws and regulations or enact new ones. Such policy changes are often targeted at non-compliant entities but end up affecting fully compliant companies in the process. The question remains whether greater oversight is a price worth paying in exchange for improved stability.

The Organisation for Economic Co-operation and Development (OECD) undertook a study comparing the nature of mining sector regulation undertaken by three major mining jurisdictions: Australia (New South Wales), Chile and Mexico. Details of the regulatory models adopted are outlined in Appendix 5. Models adopted vary from New South Wales having a dedicated regulator with a broad range of responsibilities to Chile, where responsibilities are dispersed across several government agencies. Mexico, meanwhile, has certain aspects of the mining sector overseen by government ministries [(28)]. Regardless of which model is adopted, clarity on roles and responsibilities of government and agencies is needed if the regulation is to be effective.

To address transfer pricing and base erosion and profit shifting by MNEs and enforce compliance, the ZRA set up a specialist transfer pricing unit. The unit has helped build capacity to carry out targeted transfer pricing audits on MNEs operating in Zambia. As a result, Zambia is moving in the right direction in improving the administrative capacity for transfer pricing matters in the mining sector.

To further counter harmful tax practices, Zambia joined the OECD Base Erosion and Profit Shifting (BEPS) Inclusive Framework in December 2017. The framework aims to monitor BEPS implementation and support tax administration and taxpayers. Zambia reported that BEPS reduces tax revenue, increases the tax burden on the working class, and decreases the ease of collecting taxes. In Zambia, the Income Tax Act does provide a legislative framework to counter the effects of BEPS. ZRA's Commissioner General has the discretionary powers in this case to adjust the tax payable as if the parties concerned were not associated.

Like most other jurisdictions, Zambia has adopted the arm's length principle as the legal basis to adjust for non-arm's length transactions. To further enhance the transfer pricing rules, the Minister of Finance promulgated the Income Tax (Transfer Pricing) (Amendment) Regulations 2018 (the Amendment Regulations). The amendment aligns current regulation on transfer pricing with the OECD Transfer Pricing Guidelines for Multinational Enterprises and

Tax Administrations and the United Nations Practical Manual on Transfer Pricing for Developing Countries.

Continual enhancement of ZRA's capacity is required to provide the assurance that transactions undertaken by MNEs are at arm's length.

Overall, Zambia must develop a regulatory framework that stimulates investment while providing verification that mining sector players are complying with the country's regulation. Even when trust is present, verification is required to assure all stakeholders that the country is benefiting from the activities of the industry as it should.

iii. Country credit worthiness and investment attractiveness

Zambia will need to restore its reputation as a credit-worthy partner among international investors if it is to reduce its perceived risk as an investment destination. Failure by the government to honour its debt repayment obligations has impaired trust in the government's ability to manage the economy sustainably. If successful, the ongoing debt renegotiation process supported by the now approved IMF programme will help restore the country's credibility.

That said, steps must be taken to ensure the country does not again need to engage in discussions to renegotiate its debt due to overborrowing. Maintaining a favourable credit rating is crucial to ensuring the country attracts the investment needed into this and other sectors at the right scale.

Mining companies

i. Compliance

Poor compliance levels among mining companies, especially smaller mines, needs to be addressed. Better compliance will improve trust within the industry. However, the root cause of non-compliance needs to be identified if compliance hurdles are to be overcome.

ii. Effective environment, social and governance policies

Implementing an effective environment, social and governance (ESG) strategy is an increasingly important component to a successful business. According to PwC's 2021 Global Investor Survey, of 325 investors worldwide (mainly asset managers), 49% of the respondents said they would sell their investment in a company if it was not actively addressing ESG issues [(29)].

Companies must commit to safeguarding the environment in which they operate through responsible mining and by remediating environmental issues in the areas affected by mining activity. Taking steps to mitigate the impact of mining activity on the environment is vital to ensuring the sector's legacy is positive.

A company's social policies enhance interaction with stakeholders, especially the communities in which they operate. Effective stakeholder engagement is crucial to securing the license to continue to operate in the country. It will also help clarify which social and community responsibilities fall to government and which are the duty of the mining companies and other corporate entities.

Finally, mining companies need to adopt effective governance practices that promote transparency and accountability in their operations. Enhancing levels of company disclosure about aspects of their operations is essential to building trust in the industry.

iii. Committing to transparency initiatives

Zambia is a signatory to the Extractive Industries Transparency Initiative (EITI), a global coalition of governments, companies and civil society groups who are working together to improve transparency and accountability in the management of revenues from natural resources.

The EITI has published 14 reports on the extractive industry in Zambia so far showing a reconciliation of the total remittances reported to have been received by government in the form of tax and non-tax revenue and that are reported by the mining companies as paid to government.

The latest report available is for the year 2020 [30].

Table: 11

No.	Company	Extractive companies (K'million)	Government (K'milion)	Difference (K'million)	Difference (%)
1	Kansanshi Mining plc	7,990.74	7,988.89	1.85	0.02%
2	Konkola Copper Mines Plc	652.20	614.65	37.55	5.76%
3	Lumwana Mining Company Limited	1,016.13	839.62	176.51	17.37%
4	Mopani Copper Mines Plc	1,749.20	2,061.97	(312.77)	(17.88%)
5	Kalumbila Minerals Limited	3,238.92	3,425.38	(186.46)	(5.76%)
6	First Quantum Mining and Operations Limited	1,586.41	1,434.99	151.42	9.54%
7	Chambishi Copper Smelter Limited	3,216.48	3,344.65	(128.17)	(3.98)%
8	ZCCM Investment Holdings Plc	24.29	73.60	(49.31)	(203.01%)
9	Maamba Collieries Limited	514.70	646.44	(131.74)	(25.60%)
10	NFCA Africa Mining Plc	1,023.33	954.68	68.65	6.71%
11	Lubambe Copper Mine Limited	437.53	437.89	(0.36)	(0.08%)
12	Kagem Mining Limited	135.87	168.86	(32.99)	(24.28%)
13	Lafarge Cement Zambia Plc	320.78	120.87	199.91	62.32%
14	CNMC Luanshya Copper Mines Plc	1,311.07	1,350.54	(39.47)	(3.01%)
	Total	23,217.65	23,463.03	(245.38)	(1.06%)

The reconciliation shows a variance of 1% overall between the amounts reported by government as receipts and the payments reported by mining companies. The report helps to show the total receipts and allows for a more holistic assessment of the total amount paid over and above corporate taxes.

Table: 12

Zambia Government Revenue from Extractive Sector			
Extractive Revenues	2020	2019	Difference
	(ZMW Million)	(ZMW Million)	(ZMW Million)
Tax Revenue	19,860.73	13,182.19	6,678.54
Import Tax(*)	1,567.22	2,002.92	(435.7)
VAT (**)	8,471.64	3,022.40	5,449.24
Pay as You Earn	2,536.88	2,772.84	(235.92)
Company Income Tax	5,137.40	3,203.09	1,934.31
Other taxes	2,147.59	2,180.95	(33.36)
Non-Tax Revenue	5,316.13	4,308.47	1,007.66
Fees and Charges	-	45.32	-
of which revenues collected by MMMD	40.77	41.28	(0.51)
of which revenues collected by petroleum Unit	4.88	3.05	1.83
of which MoL	0.59	0.98	(0.39)
Dividends (collected by MoF)	9.11	16.83	(7.72)
Mineral Royalty (collected by ZRA)	5,260.78	4,201.01	1,059.77
Total Domestic Revenue	25,176.86	17,490.66	7,686.20

Table: 13

Payments made by Extractive Companies and ZCCM-IH			
Payments	2020	2019	variance
	(ZMW Million)	(ZMW Million)	(ZMW Million)
Payments to Government Agencies	25,167.75	17,428.52	7,739.23
Taxes paid to ZRA (Including Mineral Royalties)	25,121.51	17,383.20	7,738.31
Royalties, fees and charges paid to MMMD	40.77	41.28	(0.51)
Payments to Petroleum Unit	4.88	3.05	1.83
Ground Rents and other payments to MoL	0.59	98.00%	(0.39)
Dividends paid to ZCCM-IH	128.95	343.77	(214.82)
Price participation fees paid by KCM	86.88	146.42	(59.54)
Dividends paid by KMP	42.07	197.35	(155.28)
Dividends paid by ZCCM-IH	40.76	75.96	(35.2)
Dividends paid to IDC	31.65	59.13	(27.48)
Dividends paid to MoF	9.11	16.83	(7.72)
Social Payments	251.74	357.86	(106.12)
Fees and levies paid to Local Councils	214.03	141.6	72.43
Payments to EPF	50.63	16.4	34.23
TOTAL	25,853.86	18,348.94	7,504.92

The EITI has also embarked on other activities aimed at enhancing transparency. A notable initiative is beneficial ownership transparency. This is aimed at improving the availability of information to citizens regarding the ultimate ownership — and by definition beneficiaries — of mining-related activities taking place in a country. Credible individuals improve the probability that a mining company will be a good corporate citizen. This is an initiative that is still being implemented.

The initiative needs to expand to include mining companies other than the big players to provide a wider view of the sector.

Conclusion

The mining sector continues to constitute a major part of the Zambian economy. Recently, the sector's strong performance has provided vital support to the broader economy, which has struggled under the weight of the Covid-19 pandemic and Zambia's debt obligations.

There are currently significant opportunities for the mining sector and the country that can be exploited. Most notably, the global shift to renewable energy technologies and the expected move to electric vehicles offer Zambia's mining sector significant potential.

However, as our analysis shows, historical events have led to mistrust between government, the mining companies and civil society and this is preventing the sector from realising its full potential.

How can Zambia rebuild trust in its mining sector and exploit current opportunities? More consistent regulation and better supervision by government coupled with improved compliance and commitment to ESG policies by the mining companies is a good start. Improving the sector's transparency so the public can be sure mining companies are paying their dues will also help rebuild trust, particularly among civil society.

Zambia is well-positioned to thrive if the challenges identified in this report are overcome. Therefore, government, the mining companies and civil society must all work together to realise the sector's full potential.

Appendicies

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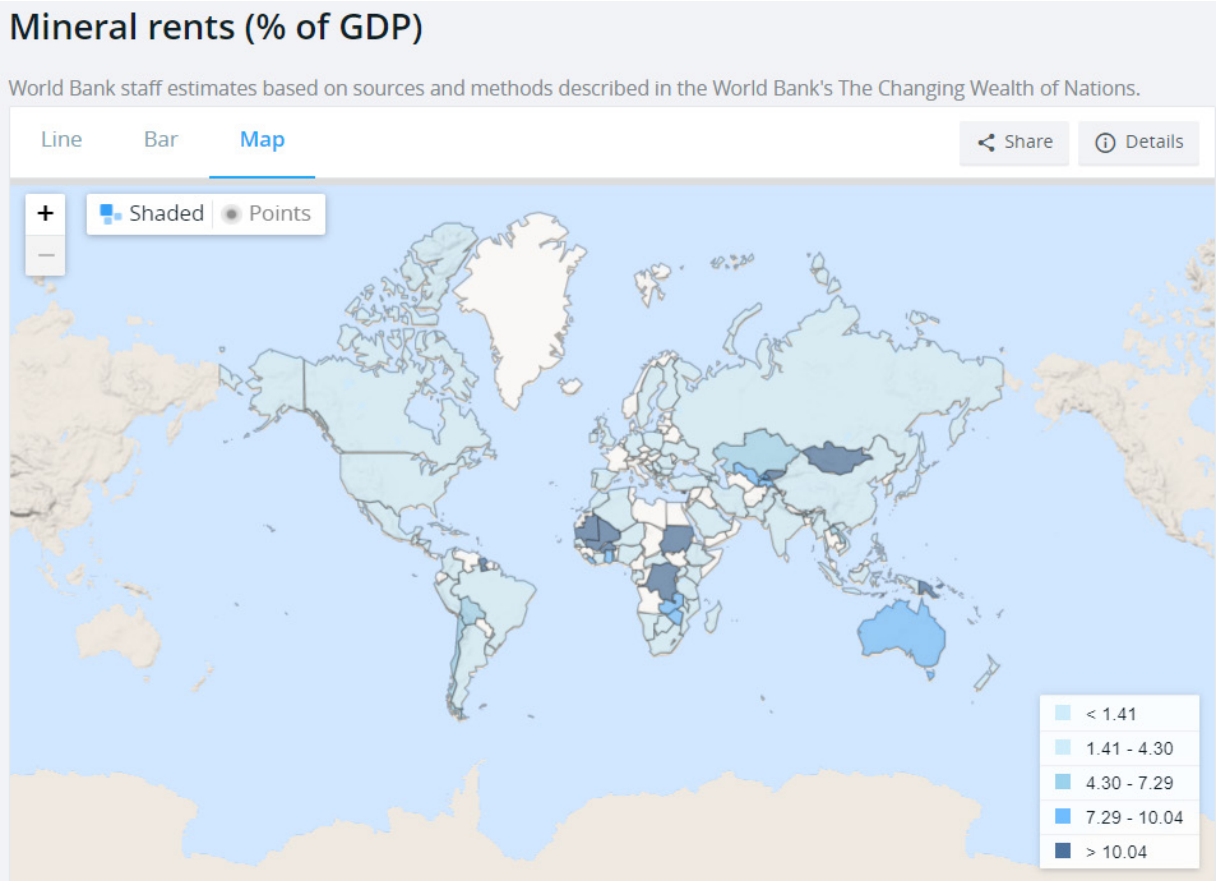
Appendix 1 - Mineral rents as a percentage of GDP by country (2)

Figure 14:



Appendix 2 – Mining sector statistics

Year	Copper price - Average (US$) - BOZ	Cobalt price - Average (US$) - BOZ	Exchange rate - Average ($1/K) - BOZ	Tax collections (K'million) - ZRA	Tax to GDP - ZRA	Copper production MT'000 (MMMD)	Copper Exports MT'000 (ZamStats)	Copper export earnings (K'million) - (ZamStats)	Export earnings (US$'million) - (ZamStats)
2001	1,577	24,644	3.61	2,449	16.60%	306.91	300	1,767	490
2002	1,557	15,634	4.31	2,849	15.40%	307.83	277	2,065	479
2003	1,780	19,395	4.73	3,549	15.30%	346.9	342	2,331	491
2004	2,869	46,525	4.78	4,554	15.30%	410.3	461	3,212	674
2005	3,685	33,625	4.46	5,522	14.80%	465	562	5,985	1,364
2006	6,718	29,354	3.6	6,325	13.80%	497.17	967	10,554	2,895
2007	7,172	62,393	4	8,184	14.60%	524	635	13,736	3,448
2008	6,939	72,137	3.75	9,665	14.40%	567.7	666	13,308	3,654
2009	5,164	27,781	5.05	9,660	12.50%	601.2	590	13,677	2,760
2010	7,543	35,352	4.8	13,126	13.50%	731.7	768	23,741	4,959
2011	8,817	31,556	4.88	18,889	16.40%	739.76	841	32,384	6,671
2012	7,943	25,042	5.14	20,719	16.10%	699.02	851	32,273	6,288
2013	7,334	23,445	5.39	23,155	16.00%	763.81	996	36,781	6,822
2014	6,834	26,883	6.16	27,604	16.50%	708.26	975	44,067	7,159
2015	5,817	27,080	7.53	29,928	16.30%	710.56	889	40,328	4,729
2016	4,875	25,544	10.31	31,189	14.40%	770.59	903	45,041	4,368
2017	6,206	55,491	9.53	38,899	16.60%	786.73	1,019	58,131	6,077
2018	6,545	72,935	10.48	48,177	17.20%	809.84	1,044	70,020	6,720
2019	6,036	34,180	12.91	52,681	17.50%	793.9	836	64,179	4,994
2020	6,213	32,102	18.31	57,423	17.30%	828.95	1,088	109,322	5,870
2021	9,288	50,595	19.92	83,573	19.70%	803.75	927	166,249	8,396

Appendix 3 – ZCCM IH investments held, and dividends received [8]

Investment	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019 (Mar)	2019 (Dec)
Subsidiaries													
Ndola Lime Company Limited	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Misenge Environmental and Technical Services	N/A	N/A	N/A	N/A	N/A	100%	100%	100%	100%	100%	100%	100%	100%
Nkandabwe Coal Mines Limited	N/A	N/A	N/A	N/A	N/A	N/A	100%	100%	100%	100%	100%	100%	100%
Mawe Exploration and Technical Services Plc	N/A	N/A	N/A	N/A	N/A	N/A	100%	100%	100%	100%	N/A	N/A	NA
Kariba Minerals Limited	N/A	N/A	N/A	N/A	N/A	50%	50%	50%	50%	50%	50%	50%	100%
Kabundi Resources Limited	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	100%
Limestone Resources Limited	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	100%
Investrust Bank Plc	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	45.40%	45.40%	71.40%	71.40%
ZCCM (UK) Ltd	100%												
ZAL Holdings Ltd (liquidation)	100%												
Associates													
Konkola Copper Mines Plc	20.60%	20.60%	20.60%	20.60%	20.60%	20.60%	20.60%	20.60%	20.60%	20.60%	20.60%	20.60%	20.60%
Kansanshi Mining Plc	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%
Copperbelt Energy Corporation Plc	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	20%	24.10%	24.10%
CEC Africa Investments Limited	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	20%	20%	20%
CNMC Luanshya	N/A	N/A	N/A	N/A	N/A	20%	20%	20%	20%	20%	20%	20%	20%
Maamba Collieries Limited	100%	100%	100%	35%	35%	35%	35%	35%	35%	35%	35%	35%	35%
Lubambe Copper Mines Limited	N/A	N/A	N/A	N/A	20%	20%	20%	20%	20%	20%	20%	20%	20%
Rembrandt Properties Limited	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	49%	49%
Dividends received (K'million)*	**29,167**	**39,130**	**25,403**	**159,513**	**79,708**	**305,481**	**803,013**	**45,065**	**48,782**	**41,330**	**199,841**	**133,323**	**122,536**
*Amounts in Kwacha rebased													
Dividend analysis	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019(Mar)	2019(Dec)
	K/US$ M	K/US$ M	K/US$ M	K/US$ M	K/US$ M	K/US$ M	K/US$ M	K/US$ M	K/US$ M	K/US$ M	K/US$ M	K/US$ M	K/US$ M
Kansanshi Mining Plc	-	US$ 3 m	-	US$ 34 m	K 39 m	K 196.7 m	K 795.4 m	K 22.6 m	K 11.9 m	-	K 149.1 m	K 44.8 m	K 122.5 m
Copperbelt Energy Corporation Plc	US$ 2.44 m	US$ 2.4 m	K 25.4 m	US$ 1.6 m	K 12.2 m	K 11 m	-	K 17.9 m	K 36.9 m	K 41.3 m	K 50.7 m	K 88.5 m	-
CEC Africa	-	N/A	-	-	-	-	-	-	-	-	-	-	-
Chibuluma Mines Plc	US$ 0.55 m	N/A	-	US $1.2 m	K 20 m	K 15.2 m	K 7.6 m	K 4.5 m	-	-	-	-	-
Konkola Copper Mines	US$ 1.39 m	N/A	-	-	K 8.5 m	K 82.6 m	-	-	-	-	-	-	-
NFC Africa Mining Plc		N/A	-	US$ 3 m	-	-	-	-	-	-	-	-	-

Appendix 4 – Detailed tax changes as compiled by PwC Zambia [13]

No.	Area	Major changes
1	**Mining operations**	2007/2008 - Ore mining; Prospecting and exploration activities: Did not include operations involving only mineral processing 2008/2009 - Ore mining; Did not include operations involving only mineral processing
2	**Tax rate**	Largely held at 30% during the period
3	**Variable tax rate**	2007 – 2008 Variable profits tax introduced. 1 Jan 2015 – 30 June 2015 – No variable tax. 1 July 2015 - Variable profits tax introduced. 1 June 2016 No Variable profits tax The tax rate for mining was set at 30%.
4	**Windfall tax**	2008/2009 A windfall tax was introduced which was triggered at different price levels for different base metals. For copper the windfall tax is: 25% at a copper price of US$2.5 per pound but below US$3.00 per pound; 50% at a copper price of between US$3.00 per pound and US$3.50 per pound; 75% at a copper price which exceeds US$3.50 per pound. 2009/2010 Windfall tax repealed.
5	**Capital allowances on capital expenditure**	2007/2008 100% on capital expenditure incurred during the year introduced. 2008/2009 100% on pre-production expenditure incurred 75% on capital expenditure incurred in 2008/2009 tax year and 25% in the subsequent year. 50% on capital expenditure incurred in 2009/2010 tax year and the balance at 25% in each of the subsequent tax years. 25% on capital expenditure incurred after the 2009/2010 tax year. Capital expenditure on new projects to be ring fenced and only deductible when the mine starts regular production. 2009/2010 100% on capital expenditure on non-contiguous mining operations to be ring fenced and only deductible when the projects start production. 2014 25% on plant and machinery (only available on assets brought into use). 2018 Introduction of the formula to be used for indexation of capital allowance for entities that maintain their financial records in United States dollar. 2019 20% on plant and machinery (only available on assets brought into use).
6	**Carry forward of tax losses**	2007/200810 years, in exceptional cases 20 years. 2008/2009 10 years on all mining operations. 1 Jan 2015 Could only utilise tax losses up to 50% of the taxable income earned from mining operations in the year under review. 2018 Introduction of indexation of losses for entities that maintain their financial records in United States dollar.
7	**Separate source income**	2008/2009 Previously hedging income was treated as part and parcel of mining income; however, following changes in legislation hedging income/losses could not be offset against mining losses or income in the tax computation. 2009/2010 Provision introduced in 2008/2009 charge year repealed. 2012 Reintroduction of treatment of hedging gains/losses as separate source income.

No.	Area	Major changes
8	**Reduced WHT from 15% to 0%**	2007/2008 Dividends - 0%; Management fees - 15%; Interest payments - 15%; and Royalties - 15%. For mining companies party to a Development Agreement (DA) with the Government of Zambia, the rate so negotiated in the DA should be applied. Generally, most DAs provided for 0% WHT on interest, royalties, dividends and management and consultancy fees. Concessions provided in the development agreements were no longer effective.
9	**Mineral royalties**	1. 2007/2008 • 3% of the gross value of the base metals produced. • 5% of the gross value of the gemstones or precious metals produced. • 2% of the gross value of the minerals other than base metals, gemstones or precious metals produced. • For mining companies party to a Development Agreement (DA) with the Government of Zambia, the rate so negotiated in the DA should be applied. 2. 2008/2009 • 3% of the norm value (weighted average LME prices) of the base metals produced or recoverable under the license. • 3% of the gross value of the industrial minerals produced or recoverable under the license. • 5% of the norm value of the precious metals produced or recoverable under the license; or • 5% of the gross value of gemstones produced under the license. • Concessions provided in the development agreements are no longer effective 3. 2012 • 6% of the norm value of the base metals produced or recoverable under the license. • 6% of the gross value of the industrial minerals produced or recoverable under the license. • 6% of the norm value of the precious metals produced or recoverable under the license; or • 6% of the gross value of gemstones produced under the license. 4. 1 Jan 2015 to 30 June 2015 Mineral royalty payable by holder of mining license or right: • 20% on the norm value of base metals or precious metals and on the gross value of gemstones and energy minerals produced or recoverable by an open cast mining. • 8% on the norm value of base metals or precious metals and on the gross value of gemstones and energy minerals produced or recoverable by an underground mining operation; and • 6% of the gross value for industrial minerals produced or recoverable under the license. Mineral royalty payable by person in possession of minerals but is not a holder of a mining right or license: • 6% of the gross value for industrial minerals; and • 20% of the norm or gross value for other minerals. 5. 1 July 2015 to 30 May 2016 Mineral royalty payable by holder of mining license or right: • 9% on the norm value of base metals or precious metals and of the gross value on gemstones and energy minerals produced or recoverable by an open cast mining. • 6% on the norm value of base metals or precious metals and of the gross value on gemstones and energy minerals produced or recoverable by underground mining operations; and • 6% of the gross value for industrial minerals produced or recoverable under the license. • Mineral royalty payable by person in possession of minerals but is not a holder of a mining right or license: • 6% of the gross value for industrial minerals; and • 9% of the norm or gross value for other minerals; and • 9% on the gross value of gemstones and energy minerals. 6. 31 May 2016 to December 2016 In June 2016, government again revised the mining tax regime as follows: • Mineral royalty for a holder of a mining license at the rate of: • 5% of the norm value of the base metals produced or recoverable under the license, except when the base metal is copper. • 5% of the gross value of the energy and industrial minerals produced or recoverable under the license.

No.	Area	Major changes
9	**Mineral royalties**	6. 31 May 2016 to December 2016 • 6% the gross value of the gemstones produced or recoverable under the license; and • 6% of the norm value of precious metals produced or recoverable under the license. For copper the mineral royalty rate payable was revised to: • 4% of the norm value when the norm price of copper is less than US$4,500 per tonne; • 5% of the norm value, when the norm price of copper is US$4,500 per tonne or greater but less than US$6,000 per tonne; and • 6% of the norm value, when the norm price of copper is US$6,000 per tonne or greater. 7. 2018 • 8% of the norm value of the cobalt or vanadium produced or recoverable. For copper the mineral royalty rate payable was revised to: • 5.5% of the norm value when the norm price of copper is less than US$4,500 per tonne; • 6.5% of the norm value, when the norm price of copper is US$4,500 per tonne or greater but less than US$6,000 per tonne; • 7.5% of the norm value, when the norm price of copper is US$6,000 per tonne or greater but less than US$7,500 per tonne; • 8.5% of norm value, when the norm price of copper is US$7,500 per tonne or greater but less than US$9,000 per tonne; and • 10% of norm value, when the norm price of coppers is US$9,000 per tonne or greater. 8. 2019 Mineral Royalties became nondeductible. 9. 2021 Mineral Royalties became deductible when determining taxable income.

Appendix 5 – Overview of mining regulation in selected countries by the Organisation for Economic Co-operation and Development (OECD) (28)

Factor	Australia (New South Wales)	Chile	Mexico
Regulatory framework and structure	Each state has its own legislative framework for granting rights, provisions of permit, licenses, or lease titles for exploration. Royalties paid to the state and compensation for owners or occupiers.	Regulatory responsibilities allocated across several government agencies with no single mining regulatory agency.	Regulatory responsibilities allocated across several government agencies with no single mining regulatory agency.
Regulatory institutions and roles	Resources and Geoscience Division of the Department of Planning and Environment Producing geological and geophysical information. Granting mining exploration and exploitation authorisation. Environmental protection. Attracting sector investment. New South Wales Resources Regulator (NSW-RR) Health and safety regulation. Regulating mine rehabilitation compliance. Receiving and considering complaints, alleged breaches of the Mining Act and safety incident notifications. Providing information and guidance about safety and other regulatory obligations to protect and support industry, workers, the community and the state. Conducting probity and compliance checks on applicants for grant/renewal/ transfer title applications. Conducting inspections and investigations. Assessing licensing, registration applications and grants applications for occupational licenses (practicing certificates and certificates of competence). Regulation of exploration activities including the issuing of Activity Approvals and ensuring compliance with title conditions and Codes of Practice. Taking enforcement action such as issuing prohibition and other statutory notices and taking prosecution action. Providing advice to the appropriate development consent authority regarding the appropriateness of rehabilitation strategies included in development applications, including advice on conditioning. Supporting and administering the NSW Mine Safety Advisory Council and NSW Mining and Petroleum Competence Board. Administering the mine and petroleum site safety fund (mine safety levy).	Ministry of mining Mining policy evaluation. Supporting investment and promoting the collaboration between private and public sectors. Reducing regulatory uncertainty. Elaborating National Mining Policy 2050 focusing on: Economic stability of the mining sector. Environmental sustainability of the mining sector. Social sustainability of the mining sector. Governance for sustainability. Sernageomin (National Service of Geology and Mines) Inspection and enforcing mining regulations in terms of safety, property and closure plans. Providing technical advice to Courts of Justice in matters relating to mining rights and providing technical opinions on projects that have environmental impact. Generating, maintaining and spreading country geological information. Environmental Assessment Service Regulating management of Environmental Impact Assessment System ensuring compliance with environmental regulation. Courts of Justice Local courts of Justice responsible for granting exploration and exploitation activities. Chilean Copper Commission (Cochilco) Undertaking development studies. Reporting on statistics. Implementation and evaluation of mineral sector public policies. Fostering evidence-based decision making. Inspecting and evaluating management actions of state-owned mining companies (CODELCO and ENAMI). Review and audit of contracts for copper and its byproduct exports for all mining companies in the country. Ministry of Economy Development and Tourism and Ministry of General Secretariat of the Presidency Lead with regulatory policy agenda for the country. Promoting administrative simplification measures.	Ministry of Economy & Ministry of Environment and Natural Resources Regulate mining policy General Directorate of Mines (DGM) This is the main sector regulator. Guarantees transparent implementation of mining regulation and at monitoring and compliance. Granting mining concessions allocation of titles. Authorising the performance of mining works and projects for exploration and exploitation of minerals. Co-ordinating the efforts of various mining sector regulators. Contributing to analysis, review, formulation, evaluating and monitoring of provisions that promote sustainable mining. The General Directorate of Mining Development (DGDM) Development of the mining sector through actions aimed at stimulating investment and competitiveness with a sustainable vision. Analysis of the mining sector and dissemination of economic information thereon. Establishing collaboration and co-ordination links with the private sector to promote mining activities and development of regions. The Mining Development Trust (FIFOMI) Provides support through training, technical assistance and financing of SMEs. Financing focused on exploration, exploitation, beneficiation, industrialisation, commercialisation and consumption of minerals and their productive chain. Federal Environmental Protection Agency (PROFEPA) Enforcing federal environmental legislation through inspection, verification and oversight for guaranteeing the protection of natural resources. Promoting a preventive approach to a corrective one. Promoting social participation. Responding to complaints. Mexican Geological Service (SGM) • Encouraging the best use of the country's mineral resource by promoting and elaborating geological, mining and metallurgical research and to generate basic geological information for Mexico. • Advising on and certifying mining projects. • Localising exploration targets.

Assessment criteria for leading–practice regulation [28]

Regulatory design	Regulator governance	Regulator conduct
Objectives of regulation are clearly defined and consistent across different regulations	Roles, responsibilities and requirements of different regulatory agencies are clear, and duplication is avoided	Regulators' processes are clear, predictable, open and transparent
Consultation during regulation-making is sufficient	Decision makers are accountable	Regulators use their resources efficiently
Regulation is not overly complex or excessively prescriptive	Regulators are independent	Administrative costs are no higher than necessary
Regulation is reviewed regularly	Regulators are adequately resourced and have necessary capabilities	

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