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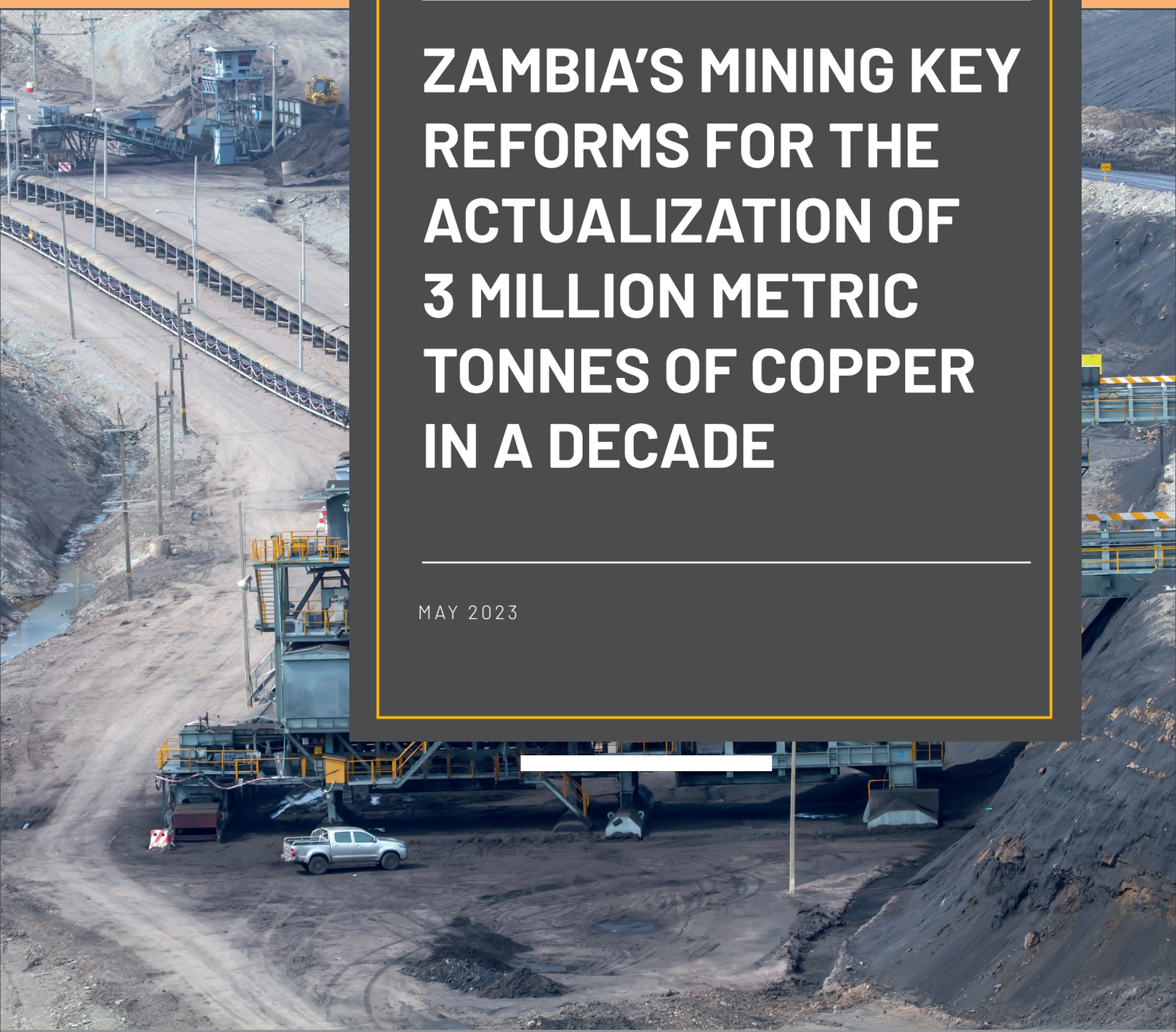
Policy Monitoring and Research Centre

REPORT

ZAMBIA'S MINING KEY REFORMS FOR THE ACTUALIZATION OF 3 MILLION METRIC TONNES OF COPPER IN A DECADE

MAY 2023



ACRONYMS/ABBREVIATIONS

ASM	Artisanal and Small-Scale Miners
ERB	Energy Regulation Board
FDI	Foreign Direct Investment
FQM	First Quantum Minerals
GDP	Gross Domestic Product
KCM	Konkola Copper Mine
MRT	Mineral Royalty Tax
PMRC	Policy Monitoring and Research Centre
PPP	Public Private Partnership
TEVET	Technical Education Vocational & Entrepreneurship Training
VAT	Value Added Tax
ZCCM-IH	Zambia Consolidated Copper Mine Investment Holding
ZRA	Zambia Revenue Authority
ZPA	Zambia Privatization Agency

EXECUTIVE SUMMARY

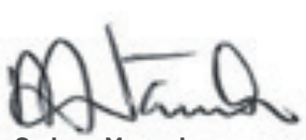
The study was conducted to identify workable reform options and suggestions essential to Zambia's aspirations of ramping up copper production to 3 million metric tonnes in a decade. The study used qualitative research approaches through expert interviews involving eleven (11) stakeholders that included representatives from the Government ministries, academic institutions, policy think tanks, mining associations, and mining business establishments.

Study findings revealed that mining in Zambia has a high tax rate compared to other countries, which is likely to affect the much-needed investment necessary to increasing copper production to 3 million metric tonnes of copper in a decade.

The study identified many significant obstacles to the mining industry's expansion that could have a detrimental impact on the realization of the 3 million metric tonnes of copper in the next ten years. These rigidities include unstable tax regimes, low ore grade for the majority of the current mines, which makes production expensive, especially for the Copperbelt-based mines, use of outdated technology, electricity supply limitations (mining expansion is largely constrained by how much electricity ZESCO can produce), regulatory difficulties and resource nationalism.

In terms of supportive sectors, the copper sector is intricately tied to other industries both primary and secondary level. The primary industries that will be crucial in supporting the mining sector include forestry, electricity, petroleum, transport and logistics as well as financial services (suppliers of goods and services to the mines require financing for them to step up). Secondary sectors key in supporting the copper mining sector include educational institutions and other utilities (through training of geologists, mining engineers, technicians, artisans, business administrators and other expertise required in the in the mining industry).

For the actualization of the 3 million metric tonnes, the report offers crucial policy recommendations. According to the study findings there are a number of reforms key for the successful actualization of the 3 million tonnes of copper in a decade based on best practices such as a stable and predictable mining tax regime, independent legal framework for Artisanal and small-scale miners, debt restructuring, 3 million metric tonnes copper production master plan and revision of the legal framework for public private partnership. The research also suggests important measures that will benefit the industry, such as granting permits to all major mining companies, expediting VAT refunds and creation of a strategic plan that provides a clear direction on geological mapping and mineral resources management.



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PMRC Executive Director

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Additionally, we sincerely thank all of our internal and external stakeholders in the mining industry, including our corporating partners, mining cooperatives, associations, and important Government Ministries, for their feedback and invaluable contributions made throughout the course of the study. We are grateful for the comments received, which helped us in refining our research findings that will be essential to the ramping up of production to 3 million metric tonnes of copper over the coming ten years.

CONTENT

LIST OF FIGURES

LIST OF TABLES

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1.0 INTRODUCTION

The mining sector remains the bedrock of Zambia's economy. Mining has been one of Zambia's major economic activities dating back to the 1920s when the first commercial mine was opened. The sector is a major contributor to foreign direct investment with the mining tax revenues contributing a significant portion of total government revenue **(World Bank, 2016).** It contributes significantly to GDP and has been the fastest-growing sector in the Zambian economy **(Sikamo et al., 2016).** In terms of the country's revenue, the mining sector contributes to the treasury through an array of taxes, directly and indirectly. In addition, the sector contributes heavily to the country's trade profile with copper accounting for a staggering 70% of export earnings **(Bank of Zambia, 2021).**

The copper industry has dominated the mining sector in Zambia for several decades despite the existence of other minerals with high private sector participation. The country's mining industry has undergone a significant transformation since its independence from private hands during the colonial era; under public ownership after independence; and then back under private hands during the wave of liberalization in the 1990s **(Simpasa et al., 2013); Tsofa, et al., 2017).** At its peak in the late 1960s and early 1970s, copper mining accounted for more than 80% of the country's foreign exchange earnings, over 50% of Government revenue, and at least 20% of total formal sector employment. During the period 1969–1975, the country saw an exceptional investment in the construction of new schools, hospitals, and roads, using surpluses from copper revenues. However, the copper industry faced several challenges after 1975 as a result of under-capitalization, overmanning, poor technology, and low copper prices on the international market **(National Mineral Resource Development Policy, 2022).**

According to the National Mineral Resource Development Policy of 2022, while the contribution of the copper mining sector to Zambia's Gross Domestic Product (GDP) declined by more than 100% in the 1970s (from 36% in 1970 to just 13% in 1975), the importance of the industry to export revenue remained significant as it averaged 94% from 1970 to 1980. But the industry's contribution to Government revenue saw a drastic decline from around 58% in 1970 to only 3% in 1976. The industry contributed very little during most of the remainder of the 1970s and 1980s. The collapse of the Zambian economy in the 1980s was intimately related to the poor performance of the copper mining industry. Some unprofitable mines and shafts were shut down.

In 1992, Government enacted the Privatization Act which led to the creation of the Zambia Privatization Agency (ZPA) to spearhead the privatization of some state-owned companies by 1996. The privatization of state-owned mines was part of the overall economic reform which took place during this period and was considered a response to the under performance of the mining sector. The privatization process was coupled with laws and policies to encourage private sector development such as the Investment Act, the Mines and Minerals Act of 1995, and the Mining Policy of 1995. These pieces of legislation and Policy not only provided a framework for private sector investment but also contained generous incentives to attract new investors. Following the massive investment of the new mine owners in refurbishing the mines, which had not been seeing any investment including in greenfield projects, production levels began to increase. By 2013, production had reached 763 000 tonnes and the industry had over 90,000 direct jobs from 22,000 at the time when privatization was completed **(National Mineral Resource Development Policy, 2022b)**.

To further provide a conducive environment for investment in the mining sector, in 2013, Government revised the 1995 Mining Policy and developed the Mineral Resources Development Policy of 2013 (MRDP). The thrust of the MRDP was to among others, encourage local and foreign private sector participation in the exploration for and commercial exploitation of Zambia's mineral resources; facilitate the empowerment of Zambians to become owners or shareholders in the mining industry and ensure the development of a profitable and sustainable private sector driven mining industry contributing to the sustainable development of the country. During the implementation of 2013, the country experienced an increase in the in-flow of Foreign Direct Investment in the mining sector and a corresponding increase in copper production as well as the production of other mineral commodities such as emeralds and manganese **(Mineral Resource Development Policy, 2013).**

In the 2022 Budget, Government announced aspirations to ramp up production from 830,000 metric tonnes to 3 million metric tonnes in a decade **(National Budget Speech, 2022).** Ramping up production from the current production entails increasing the production of copper at least three times from the current 830 thousand to 3 million or an average of 250,000 metric tonnes incrementally realized each year. This aspiration can be achieved by ramping up production in existing mines while exploring and developing new mines to meet the target in the stated period.

It is against the above backdrop that the Policy Monitoring and Research Centre (PMRC) in collaboration with the Ministry of Mines and Minerals Development undertook a study to ascertain the reform's key for attaining the set 3 million copper production target.

1.1 Situational Analysis

Zambia has a long history of mining, with copper mining, in particular, spanning almost 100 years. The country has a large known resource base of copper, gemstonnes, cobalt, emerald, and other mineral deposits with huge potential for new mineral discoveries. The mining sector remains an important part of the Zambian economy through its contribution to employment and as a key source of foreign exchange. Furthermore, it is the largest contributor to Zambia's GDP and export receipts, with copper accounting for approximately 74% (US$2.3 billion) of export earnings as of December 2021 **(Bank of Zambia, 2021).** In addition, the sector contributes between 10% and 14% to the country's Gross Domestic Product (GDP) and has been Zambia's major foreign exchange earner. As at end of 2020, the sector accounted for 70% of the country's foreign exchange earnings **(Ministry of Finance Economic Report, 2020).**

Source (Bank of Zambia, 2021)

Contribution of Mining Sector to Government Revenue

Copper mining has remained a major source of revenue in the mining sector in comparison to other mineral commodities as depicted in the table below:

Table 1: Copper vs Non-copper Mining Sector Tax Revenues from 2011 to Oct 2021 (k. Million)

Year	Copper Mining	Non – Copper	Total Annual Mining Revenues	% Share of Copper Mining	% Share of Non-Copper Mining
2011	4,500.37	595.89	5,096.27	88.3%	11.7%
2012	3,558.14	514.26	4,072.42	87.4%	12.6%
2013	2,634.21	223.39	2,857.60	92.2%	7.8%
2014	2,970.05	296.35	3,262.78	91.0%	9.1%
2015	3,832.01	362.79	4,194.83	91.4%	8.6%
2016	4,038.28	337.92	4,376.34	92.3%	7.7%
2017	3,064.34	445.06	3,509.20	87.3%	12.7%
2018	5,200.25	1,102.35	6,302.05	82.5%	17.5%
2019	6,773.54	991.46	7,664.59	88.4%	12.9%
2020	9,791.63	917.07	10,780.55	90.8%	8.5%
Jan-Oct 2021	20,818.21	1,519.33	22,337.54	93.2%	6.8%

Source: Zambia Revenue Authority

A. Current Copper Production

Four big mines dominate Zambia's copper production and are complemented by several medium mining players who play an important role in the sector. Zambian mines are owned mostly by private international investors with the Zambian Government through its investment holding company Zambia Consolidated Copper Mines Investment Holding (ZCCM-IH) being a minority shareholder in nearly all the mines

Figure 1: Copper Production by Various Mining Corporations in 2021

Legal and Institutional Framework

The mining sector is primarily regulated by the Mines and Minerals Development Act No. 11 of 2015, the Explosive Act of 1974, Environmental Management Act No. 12 of 2011, the Petroleum Act of 2008, the Lands Act, Forest Act No. 4 of 2015, Water Resources Management Act No. 21 of 2011, the Urban and Regional Planning Act 2015, the Zambia Wildlife Act of 2015, the Citizens Economic Empowerment Act (CCEA) and the Gender Equity and Equality Act No. 22 of 2015 among others.

Development of the sector is guided by the 2022 Mines and Minerals Development policy. The Policy seeks to address challenges in undertaking the country's geological mapping and mineral resource development by enhancing geological mapping of the unmapped parts of the country. In addition, the policy provides for the implementation of an effective and efficient licensing mechanism to enhance transparency and accountability in the use and management of mineral resources while at the same time catalyzing the participation of both local and foreign private investment in the exploration and commercial exploitation of mineral resources in Zambia. Lastly, the policy intends to foster the development of the Artisanal and Small-scale mining subsector **(Mines and Minerals Development Policy, 2022).**

1.3 STUDY OBJECTIVES

General objective

The main objective of the study was to establish viable reform options for the actualization of Zambia's aspirations of 3 million metric tonnes of copper to achieve annual cumulative and incremental output in a decade.

Specific objectives

This study was conducted to achieve the following:

1. Assess a suitable mining fiscal regime for the actualization of the 3 million metric tonnes of copper.
2. Establish the key challenges that are currently affecting copper production and might be a hindrance to achieving the 3 million metric tonnes of copper.
3. Identify key supportive sectors for the actualization of the 3 million metric tonnes of copper.
4. Propose recommendations of key reforms necessary for the actualization of 3 million metric tonnes of copper.

2.0 STUDY METHODOLOGY

2.1. Data collection

The study employed qualitative approaches to data collection. Firstly, a desk review of key policy documents, peer-reviewed publications, and reports related to the mining sector in Zambia was undertaken. Secondly, Key Informant Interviews (KIIs) were conducted with various stakeholders directly or indirectly involved in the mining sector. These included Government Ministries, the Zambia Chamber of Mines, Civil Society Organizations, Think Tanks, Mining Companies, and Experts in the sector.

2.2. Data analysis

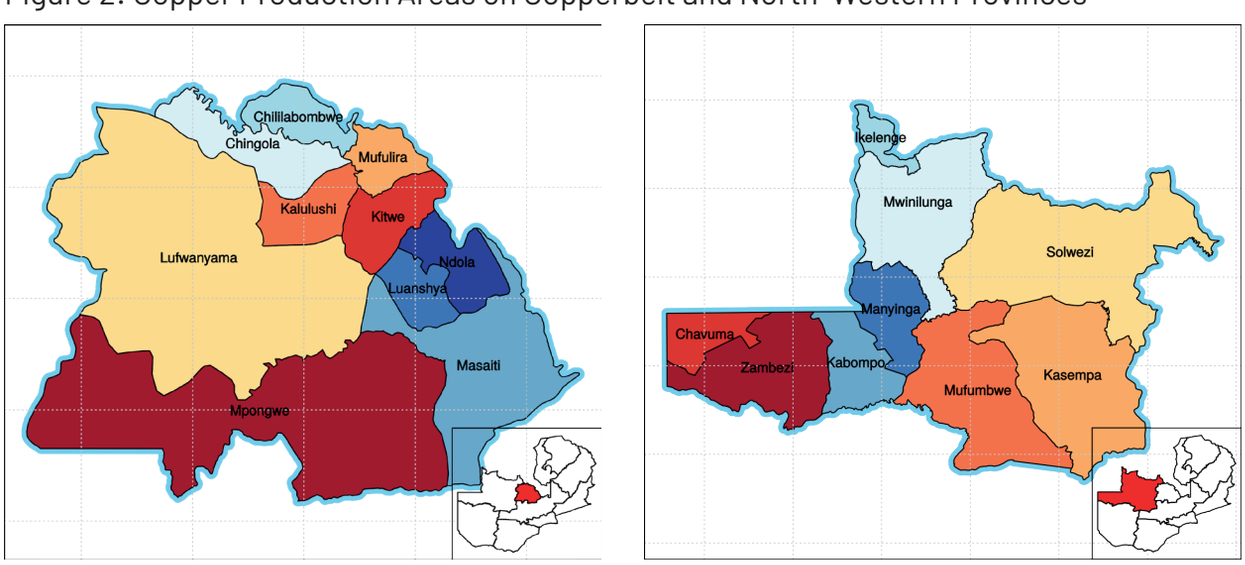
Qualitative data collected was transcribed under theme assignments to provide an in- depth understanding of the mining sector reforms in Zambia. Quantitative data was analyzed using descriptive statistics using R-software.

2.3. Study scope

The scope of the study encompassed the following: large-scale open pit and underground copper mining companies operating on the Copperbelt and North-Western Provinces: Lubambe Copper Mines Plc, Konkola Copper Mines Plc, Mopani Copper Mines Plc, CNMC Luanshya Copper Mines and FQM's Kalumbila and Kansanshi Mines respectively, Chambishi Smelter.

The study primarily focused on the following key parameters critical to the study objectives; fiscal regime and investment environment for attracting greenfield exploration and investment into mining expansion and development; legal and institutional framework to support the 3 million metric tonnes; geological information to support the actualization of the 3 million metric tonnes; and sectors that form key supportive pillars for the 3 million metric tonnes of copper.

Figure 2: Copper Production Areas on Copperbelt and North-Western Provinces



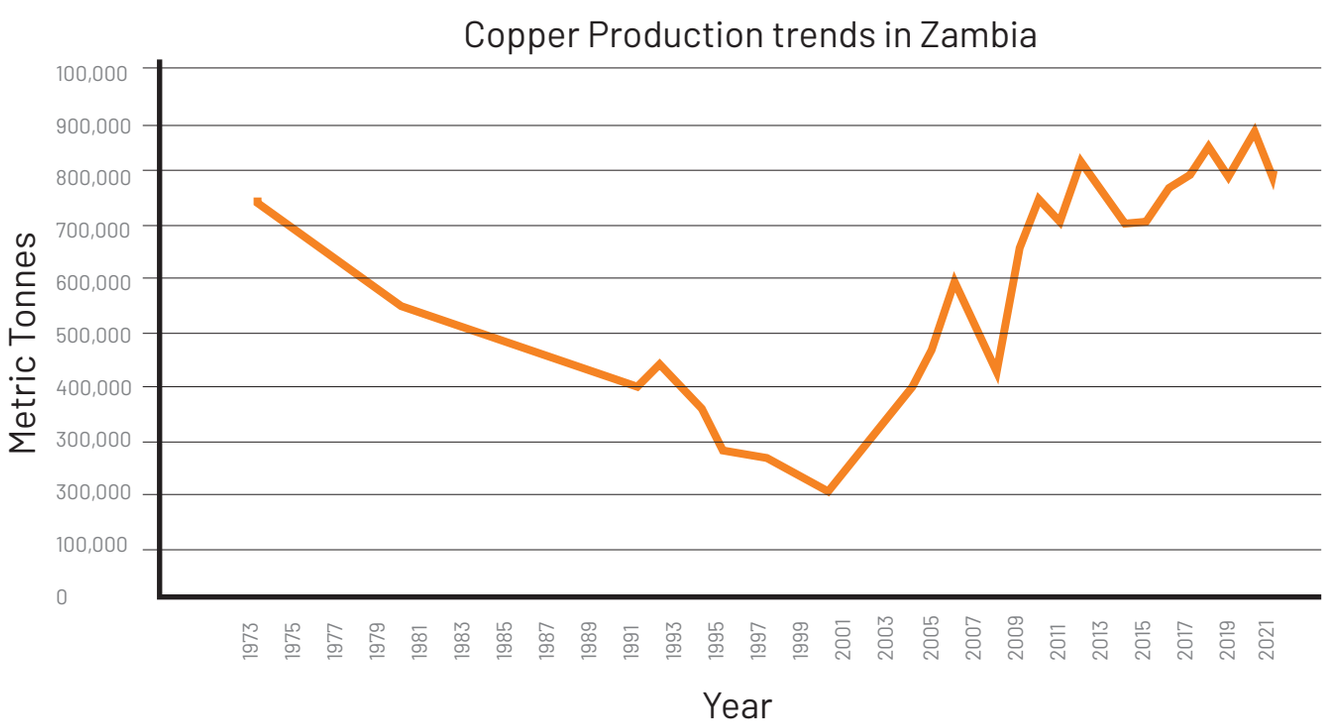
3.0. FINDINGS OF THE STUDY

3.1. Current Copper Production

According to the study, Zambia's most productive mines in the Copperbelt Province were once the glory of the province in copper production but are currently old and have depleted most of their mineral resources. Additionally, their cost of production has over time escalated due to the old infrastructure and technology which may not effectively respond to a desired increased production output due to limited hoisting capacity among others. Furthermore, some participants indicated that in some cases production in mines such as Mopani Mines requires double handling to bring out the ore from the ground. Other factors constraining production to 3 million metric tonnes mentioned during the study include the limited life of the mine, lack or low exploration projects being undertaken to define more mineral resources and uncompleted expansion projects which may require more than 10 years to fully develop and operationalize and huge capital investment required to complete the projects as well as lack of strategic partners to revamp mines such as Mopani and KCM. It was emphasized that Government needs to leverage the small-scale mines as well by creating a conducive environment for investment and incentivizing the small-scale mines for them to contribute meaningfully to achieving the set target.

The graph below shows the trend in copper production output in Zambia from 1973 to 2021 using data from the Bank of Zambia. The vertical axis represents output in thousands of MT while the horizontal axis represents years.

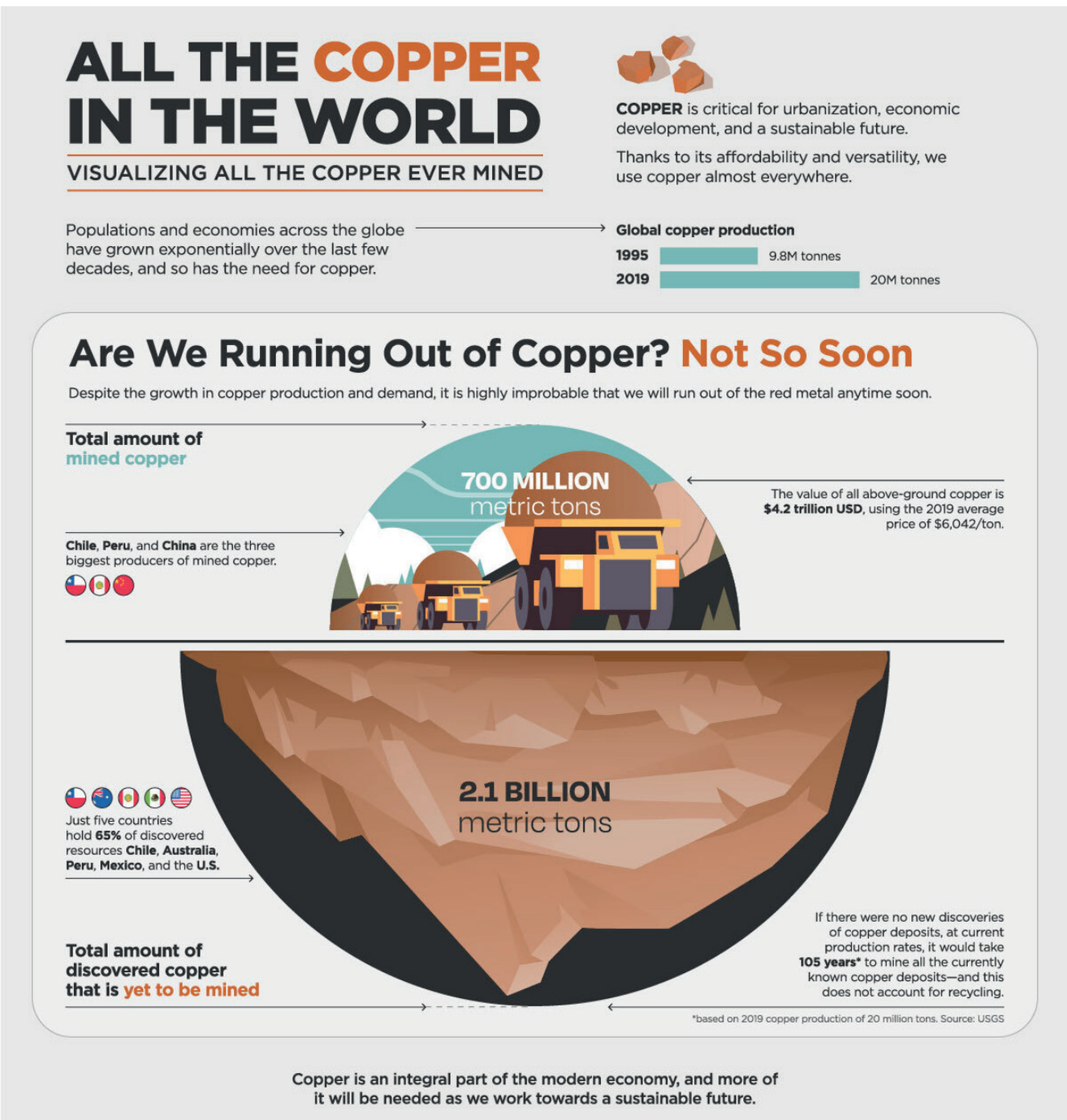
Figure 3: Historical Annual Copper Production for Zambia 1973-2021



Source: Bank of Zambia Annual Reports

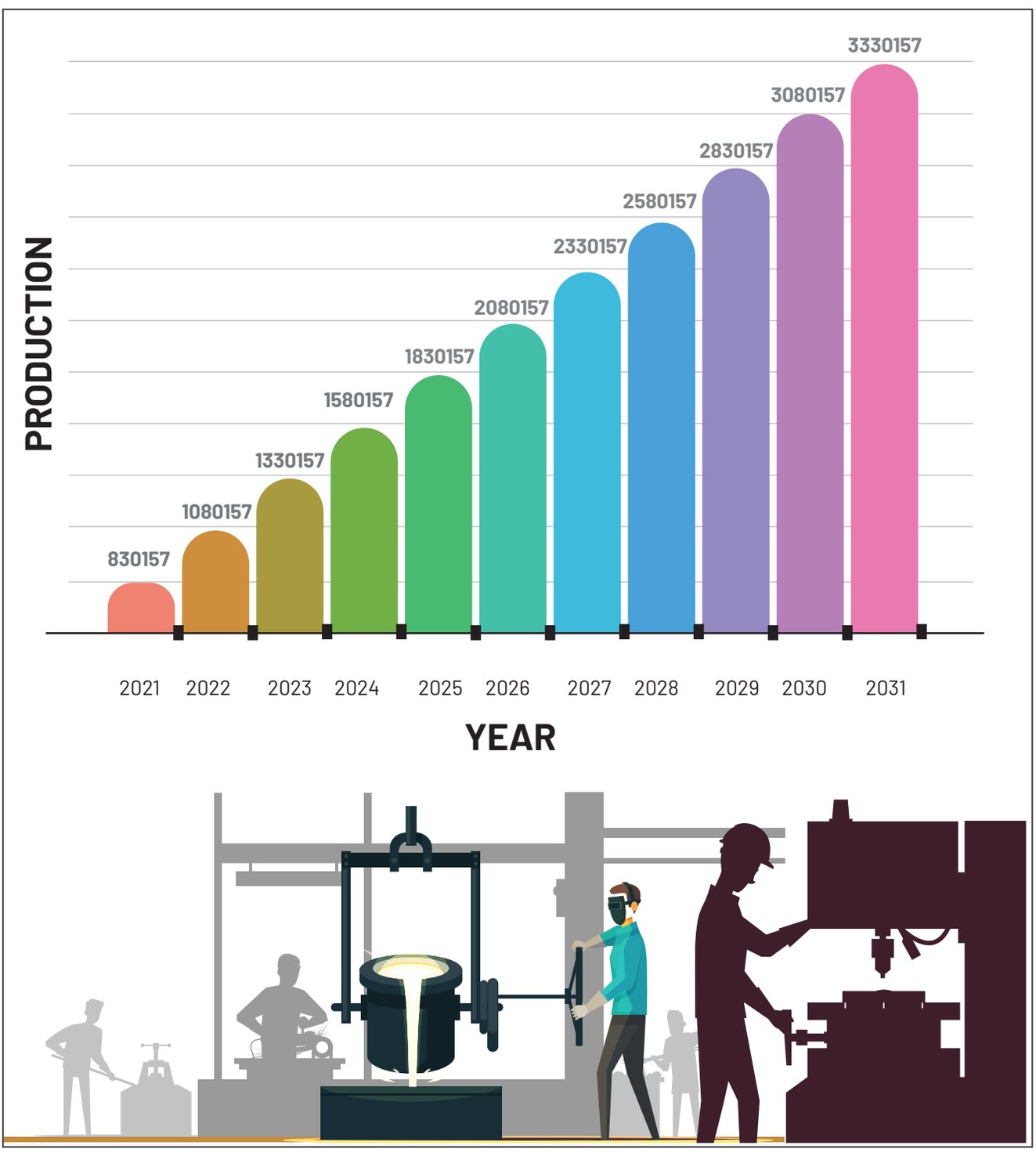
3.2 What would the 3 million Metric Tonnes of Copper Mean in a Decade

The study established that at their current productive capacity, the existing mines may not attain the set 3 million metric tonnes in their current state. As indicated in the introduction, the actualization of the 3 million metric tonnes entails expanded production from existing mines while embarking on explorations for new mines. According to the Zambia Chamber of Mines, current mining corporations have the potential to increase production to 400,000 million tonnes a year subject to investments of about $4.3 Billion in a 3-4 years period. However, there is a limit to which this can be achieved through the existing mines. Improving Zambia's exploration in the sector becomes an urgent and important step toward the actualization of the 3 million metric tonnes as the country has not carried out explorations in the last 15 years.



The incremental model for the 250,000 metric tonnes annual production towards the 3 million metric tonnes is depicted below:

Figure 4: Incremental Copper Production Model in the Ten Year Period



The table below depicts the current production of major mining corporations in Zambia as of 2021 and also looks at the opportunities for increased production through expansion projects or maintenance projects.

Table 2: Copper Production per Mining Corporation and Production Potential for the Mines Visited

S/N	MINES	LIFE OF MINE	ANNUAL PRODUCTION (MT) (2021)
1	Lubambe Copper Mines Plc	10 years (current operations) 30 to 40 years once the extension project is commissioned	18,373.32 MT
2.	Konkola Copper Mines Plc	—	58, 948MT
3.	Mopani Copper Mines Plc	Nkana Mine – 26 years Mufulira Mine – 15 years	45, 313MT
4	CNMC Launshya Copper Mines Plc	Baluba Mine – Less than 1 year Other Mine Sites – 10 years	57,785. MT
5	Kalumbila Mine	12 years (current operations)	232, 688 MT
6.	Kansanshi Mine	23 years	201,185. MT
7	Barrick Lumwana		108,790MT

	PROSPECTIVE PROJECTS	PRODUCTION POTENTIAL (2030)	COST REQUIRED TO COMPLETE EXPANSION PROJECT(S)
	Extension Project	45,000 MT at the existing mine 150,000 MT with the extension projects	Approximately US$1.1 Billion is required for shaft sinking
	Konkola Deep	180,000 MT	Konkola Deep – US$1.1 Billion
	Nchanga		Nchanga – US$ 100 Million
	Chingola East Extension Project		Chingola East Extension Project – US$ 100 Million
	▪ Synclinorium ▪ Mindolo ▪ Mufulira Deeps	160,000 MT	US$300 Million
	No expansion projects Project to maintain copper production by opening up a new site to replace Baluba	45,000 MT production is projected to reduce by 2030	—
	None	250,000 MT	—
	Kansanshi expansion project	250,000 MT	—
		140,000 MT	—

3.3 Assessment of a Suitable Mining Fiscal Regime for the Actualization of the 3 million Metric Tonnes of Copper in a Decade

Mining experts argue that a country's mining tax regime is an important catalyst for the success of mining operations and must be chosen with causation. Policymakers must ensure that there is stability and transparency in the mining code which is part of the country's competitive strategy. According to a report by the Zambia Chamber of Mines, a good tax regime encourages investments or is at least neutral and does not discourage them. Therefore, designing one requires an understanding of the whole sector value chain, investment requirements which are mostly high-risk, and the period needed for mining operations to start recouping the fruits of its investments, **(Zambia Chamber of Mines, 2019)**. The case is true for Zambia where investors have experienced an unpredictable tax regime in the last 10 years which was changed many times. Lundstol and Isaksen 2018, argue that although Zambia's mineral tax regime has changed ten times since the mid-2000s, i.e., at least once every two years on average, achieving the goal of establishing a stable fiscal regime for the mining sector has remained elusive. Researchers have blamed this, on institutional weaknesses and political interference. They see the fiscal regime as being complex, providing little certainty to the mining industry, being inefficient, and crucially lacking the flexibility that operations in risky environments require to thrive. Each new attempt to get fiscal policies right has met stiff resistance from the mining companies and other parts of the business sector or has been derailed by exogenous mineral price shocks **(Lundstøl and Isaksen 2018; Otto 2018).**

The submissions of the study are also in line with key stakeholders who indicated that in the last two-decades, mining policies and taxation regimes have changed in a short period. There was an introduction of a windfall tax, sliding scale tax, different Mineral Royalty tax for open pit mines from underground mines, and introduction of sales tax, to mention a few. These alterations have resulted in mining companies complaining about high taxes and inconsistency and could be linked to their production challenges.

Table 3 shows the various Mining Tax Regimes implemented since privatization and associated tax changes.

Table 3: Tax Regime Changes since 2008

S/N	YEAR	HISTORICAL CHANGES TO THE TAX REGIME
1	2008	▪ Increased the company income tax rate from 25% to 30% ▪ Reduction of depreciation allowance from 100% to 25% ▪ Hedging operations were to be taxed separately from mining operations ▪ Losses could be carried forward for a maximum of 10 years instead of 10 to 20 years ▪ The increased mineral royalty rate for copper and cobalt from 0.6 per cent to 3 per cent ▪ Introduced windfall tax
2	2009	▪ Abolished windfall tax ▪ Tax depreciation reverted to 100% ▪ Allowed the combination of hedging and operating income for income tax purposes.
3	2012	▪ The doubled mineral royalty rate for copper and cobalt from 3% to 6% ▪ Hedging and operating income were again to be treated separately for income tax purposes.
4	2015	▪ The Government revised the mining tax regime by replacing the 2012 regime that combined mineral royalty tax at 6% and corporate tax at 35% with a single system of the mineral royalty tax at 20 per cent as the final tax. ▪ The structure of this regime was similar to the 2012 regime the difference was that it responded to low market prices.
5	2019	▪ Mineral royalty rates for copper increased by 1.5 percentage points at all levels of the previous price ranges in the 2018 mining tax regime. ▪ The amendment of the Mines and Minerals Development Act No. 18 of 2018 introduced a fourth level of the sliding scale at 8.5% applicable when the copper price per ton is US$7,500 but less than US$9,000 and a fifth level of the scale at 10% which applies when the copper prices rise to US$9,000 and above.
6	2022-2023 Proposed regime	▪ The proposed restructuring of the mineral royalty regime for copper. Amending the mineral royalty tax to be calculated on an incremental or sliding scale basis as opposed to aggregated value when the prices of copper cross respective price threshold. ▪ In addition, the 2023 budget has propped to reduce the lowest marginal rate to 4.0 percent from 5.5 percent.

It was noted by all the mining houses that participated in the study that the current mining tax regime was generally high in comparison to other jurisdictions within the region with an effective tax rate of over 75%. Consequently, this has been regarded as an impediment to attracting both local and foreign direct investment in developing both brown and green field projects due to the uncompetitiveness of the tax regime. Coupled with that, the instability associated with the various mining tax regimes Government has been implementing since privatization makes it difficult for planning and investment purposes which are critical aspects in effectively managing any business undertaking.

Table 4: Current Mining Tax Rate Composition

S/N	TAX	RATE
1	Mineral Royalty	1. When the copper price is less than US$4,500 – 5.5% 2. US$4,500 but less than US$6,000 – 6.5% 3. US$6,000 but less than US$7,500 – 7.5% 4. US$7,500 but less than US$9,000 -8.5% 5. US$9,000 and above – 10%
2	Company income Tax	Income from mining operations 30% Income from mineral processing 35%
3	VAT	16%

3.3.1 Changes Associated with the 3 Million Metric Tonnes 2022 and 2023 National Budget Mineral Royal Tax Changes

To create a conducive environment supportive of actualizing the set target of attaining 3 million metric tonnes of copper production in the next ten years, the Government has made some positive strides towards realizing this objective and further attracting investment in the sector. Some of the strides made include making Mineral Royalty Tax (MRT) deductible for Corporate Income Tax (CIT) computation purposes which were previously not deductible thus, resulting in double taxation and the recent issuance of Statutory Instrument No. 50 of 2022 which among others has suspended import taxes on mining equipment and machinery.

When asked about the 2022 budget proposal to re-introduce the deductibility for MRT for CIT purposes, the mining houses positively welcomed the decision by the Government. They stated that the double taxation aspect which was associated with not having MRT deductible previously will provide an opportunity to channel saved resources to other critical areas such as expanding mining operations, mine development and long-term investment. Further, the deductibility of MRT now aligns Zambia's mining tax regime with international best practices in the treatment of allowable expenses.

However, in as much as most of the mining entities expressed appreciation in having MRT deductible, they were generally of the view that the current tax regime post-re-introduction of MRT deductibility still has a high effective tax rate when compared to other copper mining jurisdictions, this is mainly driven by the high mineral royalty tax rates. The respondents indicated that a high MRT tax rate is not favorable to effectively attract investment as it remains high in comparison to other jurisdictions in the region.

In the 2023 National Budget, the Government proposed to restructure the mineral royalty regime for copper and amend the mineral royalty tax to be calculated on an incremental or sliding scale basis as opposed to aggregated value when the prices of copper cross respective price threshold. In addition, the 2023 budget has proposed to reduce the lowest marginal rate to 4.0 percent from 5.5 percent.

Table 5: 2023 National Budget Proposed Changes to Mineral Royalty Tax (MRT)

Current Regime			**Proposed Regime**		
Price Range	Taxable Amount	Rate %	Price Range	Taxable Amount	Rate %
Less than US$4500 per tonne	Full price amount	5.5	Less than US$ 4000 per tonne	The first US$ 4000	4.0
US$4500 per tone or more but less than US$6000 per tonne	Full price amount	6.5	US$4001 per tonne or more but less than US$5000	The next US$1000	6.5
US$ 6000 per tonne or more but less than US$7500 per tonne	Full price amount	7.5	US$ 5001 per tonne or more but less than US$7000	The next US$ 2000	8.5
US$ 7500 per tone or more but less than US$9000 per tonne	Full price amount	8.5	US$ 7001 per tonne or more	The balance	10
US$9000 per tone or more	Full price amount	10			

Source: 2023 National Budget Speech

When asked about the proposed changes to MRT in the 2023 budget to apply MRT only to the incremental value in each price range when the price of copper crosses each MRT threshold, a simulation of this application to existing company production and prevailing London Metal Exchange prices, showed a reduction in MRT. This will be an additional incentive to the mining industry and is likely to attract further investment in the sector. Any further investment in the existing mines and new ones will result in increased copper output, albeit the benefit most likely in long term.

While these changes to MRT computation were appreciated, other study participants had a view that the changes would have been at the remaining prevailing prices as shown below;

Table 6: Proposed Mineral Royalty Tax (MRT) Structure by Mining Houses

RATE %	**CURRENT PRICE**	**PROPOSED PRICE**
4	Up to $4500	$4000
6.5	$4500-$6000	$4001-$5000
8.5	$6001-$7500	$5001-$7000
10	>$7501	>$7001

The participants indicated that Democratic Republic of Congo (DRC) attracted the most investments in the mining sector at the MRT of 2% and later increased it to 3%.

3.4 Key Challenges Currently Affecting Copper Production in Pursuit of Achieving the 3 Million Metric Tonnes of Copper in the Next Decade

The study has established that the mining sector has been faced with several challenges which will require to be resolved to support the aspirations of the Government to meet the set objectives of attaining 3 million metric tonnes of copper production in a decade. The following are some of the major challenges:

3.4.1 Unstable and Inconsistent Mining Tax Regime

The mining tax regime has been unstable, uncompetitive, and unpredictable for a long time now. Coupled with the unstable tax regime, mining houses indicated that the current tax rates are high in comparison to other jurisdictions which makes it difficult to attract both local and foreign investment.

3.4.2 Delayed VAT Refunds

Government is urged ensure that VAT refunds are paid on time to the mines. Most of the mine's working capital has been held up due to non-payment of VAT refunds which contributed to the slow pace of development in the industry.

3.4.3 High Cost of Capital

The high-interest rates in the nation are detrimental to business and the mining industry will not be an exception. The high cost of capital will discourage indigenous, Zambians from venturing into credible mining operations. Small mineral deposits can easily be exploited by local companies, but start-up capital has always been a challenge. According to the study participants, Zambia has a high-risk premium of 11.32% from 10% pre-COVID-19 era. The increase in the risk premium is associated with 2020 Euro Bond default.

3.4.4 Inadequate Local Sources of Financing Mining Projects

Mining operations require huge capital inflows for investments and expansion projects and such huge capital needs are not available on the local market. The Banking and Financial Services Act, of 2017 section (82)(a), stipulates that a bank or financial institution shall not, directly or indirectly provides for except as the Bank may prescribe, grant a credit facility or guarantee a debt of a person or common enterprise so that the total value of the credit facility and guarantee, in respect of a person or common enterprise, is more than twenty-five percent of the regulatory capital of the bank or financial institution. The mining houses who participated in the study indicated this provision has impacted funding for most of the mining projects as most mines have to source funding from outside the country.

3.4.5 High Cost of Energy

The Government limits input VAT on Electricity as the current tax regime 20% of the total VAT on Electricity and 10% of diesel are non-deductible for VAT purposes. Power cost is a huge component in the costs of a mine and subjecting to being nondeductible for VAT purposes reduces the VAT refundable and reduces a mine's working capital ability to help boost production.

3.4.6 Lack of Detailed and Updated Geological Information

The lack of geological information continues to undermine the growth of the mining sector. Only about 55 per cent of the country had been geologically mapped and the information available is too old and not of high resolution. Most of the mining entities that participated in the study attributed the lack of adequate funding to the Ministry of Mines and Minerals Development as the reason for the lack of high-quality mineral information in the country.

3.4.7 Licensing Challenges at the Cadastre Department

The Mining Cadastre Department under the Ministry of Mines and Mineral Development has been issuing licenses in areas already licensed to other mines. The Issuance of new licenses on portions of existing ones resulted in a serious challenges that have been perpetuated for over a decade. These encroachments have led to litigation which have led to delayed exploitation of mineral resources and discouraged investments into new mines. The mining houses commended the Government on the Cadastre audit and hoped they could expedite the implementation of the mining audit results.

3.5 Key Supportive Sectors for the Actualization of the 3 million Metric Tonnes of Copper in the Next Decade

The mining sector is inextricably linked to other sectors through upstream and downstream linkages. The major sectors that will play a critical role in supporting the mining sector are forestry (timber and other logs used in the production process); manufacturing (supply of mining equipment, lime, and cement used in the production process); electricity; construction; transport and logistics; as well as financial services (suppliers of goods and services to the mines require financing for them to step up); education institutions (through training of mining engineers, artisans, business administrators, and other experts are required in the mines), etc

3.5.1 Infrastructure

An increase in copper production will entail a corresponding increase in support sectors such as road and railway infrastructure to positively respond to the requirements which will come along with the increase. There will be a need for both road and railway infrastructure development as the current road and railway network is not in a good state to handle the amount of tonnage envisaged. Rail networks are critical to landlocked Zambia's mineral-exporting economy. Rail transport continues to be the most competitive mode of transport for bulk, time-insensitive commodities, such as copper. Currently, Zambia's railways' low traffic densities are well below the viability threshold of at least 8 kilometre per /hour for railways of this kind, making it difficult to capture the revenues needed to maintain assets. Additionally, there will be a need to build more mine-related infrastructure such as concentrators and smelters to handle the increased output.

3.5.2 Energy

This will also call for increased power generation and supply to the mines to run the concentrators and smelters. According to the Zambia 2019 Energy Policy, demand for energy in Zambia is increasing at an average of 6% annually. With the mining sector being the highest consumer at 51.1% (Energy Policy, 2019). An increase in copper production will require a reliable energy supply. According to the Government's green paper on the results of the cost-of-service study, recent projections show that the peak demand is estimated at 8,000 Mega Watts (MW) by 2030 and about 10,000 MW by 2040 and this increase will be driven by mining and agriculture sector expansion.

3.5.3 Skills and Human Capital Availability

With the shift in the Zambian economy towards more capital and skill-intensive sectors such as mining, construction, transportation, and manufacturing, the demand for technical skills for the operations of heavy equipment has increased. However, construction and mining sector employers

struggle to find skilled workers who meet modern machinery operational skills requirements. The situation is compounded by the need to integrate Fourth Industrial Revolution technologies into heavy machinery operations. There is a mismatch in most of the skilled labour being produced on the labour market to the requirement of the mining sector. The university and TEVET syllabus has not made an advancement to catch up with the advancement in technologies most mines are using. This has led to the mass importation of skilled labour from other countries or sending of indigenous Zambians for further study. Both options are an additional cost to the operations of mining. There is a certain level of misalignment between educational institutions' curricula and the needs of the industry. University courses were criticized for being too academic, leaving students with few practical skills. The lack of modern equipment in schools contributes to the problem.

3.5.4 Suitable Business Environment

The cost of doing business is critical especially access to affordable financing, currently, there are challenges in accessing finance for most local suppliers who can only access financing through third-parties making borrowing expensive. This high cost of capital is due to the high-country premium which stands at 11.32% compared to neighboring countries like Zimbabwe with a country risk premium of less than 6%.

3.5.5 Improved Explorations

According to the Zambia Chamber of Mines, while current mining operations have the potential to increase production by 400,000 metric tonnes per annum subject to an investment of $43 Billion, there is a limit to what can be achieved from existing mines towards the 3 million metric tonnes aspiration in a decade. This, therefore, calls for improvements in exploration in the country as, over the last decade, there has been an inadequate exploration in the sector to encourage mining activities. The study established that most of the existing mining houses are currently not undertaking exploration projects. This implies that not much is currently being done to secure future Greenfield investments, a situation which if left unattended to, may not work in support of the copper production aspiration set. As explorations take 5 – 10 years there is a need to incentivize the 22 existing exploration projects as they are critical for the 3 million tonnes aspirations in a decade.

3.5.6 Smelting Capacity

Zambia has the potential to produce 1.2 million tonnes of finished copper per year. The aspirations of ramping up production to 3 million metric tonnes of finished copper per annum in a decade entails the need to build extra smelting capacity three times the size of the Kansanshi smelter with a capacity of 500,000 tonnes per annum.

3.5.7 Policy and Legal Framework

The policy and legal framework that supports the mining sector in Zambia details appropriate regulations and procedures that promote the exploitation and development of mineral resources. The legislation provides for the development of mineral resources to maximize mineral revenue generation, among the economic benefits of mining to a country. Most of the participants indicated that the current policy and legal framework is not adequately addressing some of the challenges the mining sector has been experiencing such as the administration of mining rights, and unclear definition of the role of traditional

leaders and communities. There is a need for the policy and legal framework to be revised and amended to effectively respond to some of the existing and emerging issues in the sector. Further, the policy and legal framework must be aligned with other policies and legal frameworks to avoid the possibility of having contradicting policy and legal documents.

The launch of the National Mineral Resource Development Policy of 2022, provides a revised policy framework within which the 3 million metric tonnes will be achieved. Some of the objectives of the policy that support the 3 million metric tonnes aspirations include:

i. Enhance geological mapping and mineral resource exploration to increase commercial exploitation of mineral resources in Zambia.
ii. Enhance efficiency, effectiveness and transparency in the management and issuance of licenses.
iii. Enhance the monitoring of operations and compliance in mining and non-mining rights areas.
iv. Facilitate the formulation of a consultative, competitive and sustainable mining tax regime.

3.6 Proposed Recommendations from the Study

The following were the recommendations from the study participant's key for attaining the actualization of the 3 million metric tonnes of copper production in a decade:

3.6.1 A Predictable and Stable Mining Tax Regime

Government must put in place a competitive, stable, and predictable mining tax regime that will stand the test of time. A mining tax regime that is unstable makes it difficult for investors to make accurate projections on their return on investments. This may prove detrimental to the growth of the mining sector.

3.6.2 Expedite to Resolve the Impasse on Mopani and KCM

The study recommended that there was a need for Government to expedite the process of finding potential investors to invest in Mopani Copper Mines Plc and Konkola Copper Mines Plc and hasten the liquidation of KCM. Participants were of the view that the continued lack of investment in both mines and the liquidation process of KCM has adversely affected the production in the sector. There is a need for government to expedite the process by Rothschild of South Africa to expedite the evaluation process of Mopani which will enable the mine to become financially viable once more and prevent any further losses and promote re-investment in the mine.

3.6.3 Increase Funding to the Ministry of Mines and Minerals Development

This Study recommends an increase in funding for the Ministry of Mines and Minerals Development especially for the Department of Geology and the proposed Mining Commissions to support monitoring and mapping activities. If mapping could be carried out in the whole country, the extent of available mineral resources could be determined. This would help attract investors and ramp up exploration activities.

3.6.4 Incentivize Explorations

The study reviewed that well-structured incentives to private sector players are critical for the growth of copper mining industry. The Government needs to actively incentivize exploration with policies that acknowledge that exploration is a loss-making research and development activity that generates no income, but whose success is in the national interest.

3.6.5 Improve Institutional Efficiency to Revitalize Mining Investment:

In the short term, there is a need for Government to develop and operate a mining project permitting dashboard and an accountability scorecard to track and evaluate mining projects' investment progress, systematically and in real time. This will cure the problems the Cadastre had experienced in the recent past and invest on institutional strengthening, modernization and capacity building of the Ministry of Mines and Minerals Development and Directories of Mines.

4.0 MINING BEST PRACTICES FROM OTHER COUNTRIES

The aspiration to ramp up production to 3 million metric tonnes per annum in a decade is not one that does not stand in isolation, some countries have ramped up production. Through the implementation of the right policies and strategies which Zambia can learn from best practice. This study has looked at Chile, Peru, Congo, and Botswana as mining jurisdictions where they can borrow some success stories for implementation.

Chile

Chile has a long mining history and is well known for its first-class mining deposits. Mining, therefore, is a key sector of Chile's economy. Chile accounts for 28 per cent global copper market share, which makes it the biggest producer of copper in the world.

By the end of the 19th century, mining had claimed a leading role in Chile's economy, mainly with the production of silver, gold, and particularly copper. By the mid-twentieth century, Chile secured its position as a leading copper producer in world markets. Between 1900 and 1973, copper production increased on average by 70 per cent per decade. Production slowed between 1973 and 1982, but more than tripled from 1982 to 2007 **(Wagner and Diaz, 2008; COCHILCO, 2009).**

Foreign capital has played a major role in the development of the Chilean mining industry, both historically and today. In the 19th century, British entrepreneurs were among the first to invest in the country's nitrate deposits. American investment, through Transnational Mining Companies (TNCs) such as Anaconda and the Guggenheim Group, was the primary driver of copper production in the early and mid-twentieth century.

According to the United Nations Conference on Trade and Development (UNCTAD) 2011 report on how to attract and benefit from Foreign Direct Investment (FDI) in mining: lessons from Canada and Chile, the success of the Chilean Copper subsector is attributed to both the supply factors and Policy and institutional framework.
Supply factors: Chile has around a third of the world's copper reserves and significant reserves of other minerals such as molybdenum, lithium, nitrates, and iodine. Exploration has been extensive in the past three decades registering the highest level of exploration investment in the world in 1997. Major reasons for this trend have been the quality of pre-existing copper reserves, and the limited taxation of mineral revenues which ensured that companies would capture a very large share of mineral rents if a deposit was discovered. International mining investors rank Chile fifth out of 72 mining jurisdictions in terms of pure mineral potential.

The state of physical infrastructure in Chile is mixed. On the one hand, many stakeholders recognize Chile's transportation infrastructure as a positive factor contributing to the attractiveness of the country as a destination for foreign investment. Roads, ports and airports have improved their standards in recent decades as a result of strong public and private investment, resulting in the expansion of many transport services relevant to mining activities. While water scarcity has been an impeding factor affecting most mining operations.

Lastly, another positive supply factor that has led to the success of the mining sector in Chile is the availability of skilled workers, professionals and services. The long history of mining in Chile, including experience with a large state-owned mining company, has contributed to the existence of a strong mining culture, with a willingness of workers and professionals to work in the industry. A network of 11 universities offering programmes focused on mining, geology and metallurgy has also contributed to the build-up of relevant skills in the Chilean population. Since 2000, Chile has graduated more mining engineers than any other country, except the United States, Australia and Europe as a whole (Hebblewhite and Knights, 2009).

Policy and Institutional Framework

To attract foreign direct investment in the sector, the Government of Chile formulated the Foreign Investment Statute or Decree-Law 600 a legal statute passed in 1974 under the military Government but amended again in 1993 and 2006. Several aspects of the law are attractive from a foreign investor's perspective. First, it allows the entry of foreign capital and the creation of a contract with the Chilean Government (Articles 2 and 3). Second, it guarantees non-discriminatory treatment for foreign investors concerning legal or regulatory provisions **(Articles 1 and 9)**. Third, foreign investors are given the right to transfer capital and net profits to other countries **(Article 4).** Fourth, foreign investors are entitled to include clauses in their agreements with the Chilean Government, whereby certain tax rates and regulations can be fixed for a period of 10 or 20 years, depending on the size of the investment **(Article 7, 8, 11 bis, and 11ter)** .

Chile has traditionally been one of the lowest-taxed mining jurisdictions, although the Government has made efforts recently to increase the share of mineral revenues going to the State. Until 2006, mining companies operating in Chile were not subject to a special mineral tax or royalty. The general income tax regime is the lowest in Latin America, with a corporate tax rate of only 17 per cent - although there is a 35 per cent withholding tax on remitted profits. Tax incentives to accommodate the specific needs of the mining industry were introduced, including accelerated depreciation and deferred payment of customs duties on imported capital goods. Moreover, as noted, qualified investors can enter a stability agreement with the Chilean Government to fix the tax regime. The above factors combined to establish Chile as one of the jurisdictions with the lowest tax burdens for mining activities **(Colorado School of Mines, 1997; Otto, 1997).**

Lessons Learnt from Chile

Zambia could draw the following lessons from the Chilean Mining industry given the similarities between the two countries and the quest to attract investment, boost copper production, and ensure that all citizens benefit from the wealth generated from copper. The case of Chile is particularly relevant for mineral-rich developing countries since it relied heavily on foreign investors to develop its mining industry. It has gone through many challenges along the way, including the need to provide an attractive policy climate after nationalization, and more recently, the need to ensure that the country receives a fair share of mineral rates from foreign investors. Chile's use of foreign companies to enhance environmental and social practices in the mining industry also holds lessons for developing countries like Zambia.

1. Zambia can adopt the Chilean mining tax regime which is relatively stable, Zambia's mining industry would greatly benefit if such a system is adopted as Zambia losses out on investment from risk-averse investors who may not invest given unpredictable terms.
2. Chile has an invariability clause, which guarantees that the tax regime in place at the time of signing a contract will run for a certain period – up to 12 years for small projects and 20 years for large projects, this too puts some form of predictability on investment, thereby attracting more foreign direct investment. An invariability clause for Zambia would culminate into more investment as even risk-averse investors would likely want to invest in Zambia.
3. Chile promotes Foreign Direct Investment (FDI) through a solid legal framework, substantial tax incentives and very few restrictions, further there are no limits on foreign ownership or control of business entities, and there is no discrimination against foreign investors, who receive similar treatment to Chilean nationals.
4. Chile is known as the least corrupt country in South America. Transparency International's corruption perception index for 2021 ranked Chile 27th out of 184 countries, which is way ahead of Zambia, which was ranked at 121st place.
5. Finally, Chile was ranked as a good place to conduct business by the Economist Intelligence Unit in their 2014 to 2018 survey of the friendliest countries to do business in. It was ranked 13th out of 82 countries, well ahead of the UK, France and South Korea. Zambia is well known in the region for its peace- and peace-loving citizens, like Chile, this attribute can be taken advantage of when advertising the country to outsiders and potential investors.

Peru

Peru is considered one of the world's top ten richest countries in terms of mineral endowment. In 2019, it ranked as the world's second-largest producer of copper (after Chile), silver, and zinc, and the largest producer of gold, lead, and tin in Latin America. According to the most recent data published by the US Geological Survey (USGS), Peru has 10% of the world's copper reserves, 4.8% of its gold, 19.6% of its silver (the largest reserves in the entire world), 9% of the zinc, 7% of the lead, and 2.3% of the tin **(Ernst and Young, 2019).**

Over the last ten years, mining in Peru went from a gold rush to a copper boom. Investment peaked between 2011 and 2014 when approximately US $21 billion were spent on the construction of large (mainly copper) mining projects: Las Bambas (US $10 billion); expansion of Toquepala (US $1.2 billion); expansion of Cerro Verde (US $4.6 billion); Constancia (US $1.8 billion); and Toromocho (US $3.5 billion). According to MINEM, Chinese investment in the Peruvian mining sector amounted to close to US $15 billion between 2009 and July 2020 **(World Bank, 2021)**..

In terms of the competitiveness of Peru's mining sector for investment, the country is recognized by its mineral resources and low production costs, but resource reserves are not enough to ensure competitiveness. According to the Fraser Institute, in 2018 Peru was the second most attractive country in Latin America for mining investment, coming in eighth place on geological potential and fourteenth on the general global ranking. In addition, Peru's performance is considered unsatisfactory on other points such as infrastructure quality, socioeconomic agreements with communities, uncertainty concerning disputed land claims, political stability, and labour regulations **(IIMP, 2019)**.

In terms of the policy and legal framework in Peru, the State retains ownership of all mineral resources. The country's legal framework clearly defines the rights, obligations and responsibilities for all stages of mineral resource development. For almost three decades, guaranteeing the legal security of investors and providing an attractive legal framework for mining investment have been at the heart of the mining legislation. The following legal norms are the most relevant for the mining sector:

- Ordered Unique Text of the General Mining Law approved by Supreme Decree No. 014-92-EM (TUO-Texto Único Ordenado de la Ley General de Minería) and its amendments;
- Law No. 27651: Law for the Formalization and Promotion of Artisanal and Small-scale Mining(2001);
- Supreme Decree No. 042-2017-EM of December 22, 2017, approving the Environmental Regulations for Mining Exploration Activities; and
- Supreme Decree No. 020-2020-EM of August 7, 2020, updating the Mining Regulations.

Lessons from Peru

i. International investment is a vital part of the growth and success of Peru´s exploration and mining industry. Peru's open and stable mining regulatory environment has greatly contributed to the foreign investment flowing into its economy. A foreign investment law guarantees the security of foreign and domestic investments.

ii. Peru's clear and simple mining law and excellent geological potential has helped the country to attract one of the largest budgets for minerals explorations and development in the world.

iii. Further, Peru is consistently undertaking measures to improve its business climate to attract more investment.

Democratic Republic of the Congo (DRC)

The DRC has substantial untapped gold, cobalt and high-grade copper reserves, but equally, significant security risks accentuated by a lack of robust infrastructure. In 2019, mine production of cobalt in the DRC totalled 100,000 metric tonnes, accounting for 70 percent of global production. The DRC was the third largest producer of industrial diamonds in 2019, contributing about 21 percent of global production **(EITI, 2021) .**

According to Van Vuuren (2017), despite, having been war-torn, DRC overtook Zambia in 2013 to become Africa's leading producer of copper with an output of 925 000 tonnes. This is an unexpected achievement, given that 10 years earlier, the country was only producing 70 000 tonnes annually. The rapid increase in copper production in DRC is attributed to the following;

- DRC boasts some of the highest quality copper reserves globally, with some of the mines estimated to contain grades above 3 percent, significantly higher than the global average of 0.6 - 0.8 percent. International mining companies attracted by high-grade and low-cost mines are increasingly attracted to the DRC's copper wealth situated on the copper belt in the southern part of the country.

- Congo with support from the World Bank implemented of an investor-friendly mining code that had been enacted in 2002. The code contained a fairly low tax rate of 30% of profits, a Government stake of 5% in new mining projects and royalties of 2% on copper and cobalt. This opened up the mining industry to considerable foreign investment and new mine development, despite political instability in the region and the continuous threat of conflict.
- In addition, the DRC's production costs are extremely favourable compared to regional competitors. In 2013 the average production cost of copper in the DRC was $3,672 per tonne. The same cost of production was $4,582 in Zambia and $4,931 in South Africa. This contributes to it being a favoured mining destination in the region.

Lessons from DRC

In getting lessons from DRC there is very little Zambia can do about the grade of ore that is available to mine, but they can make sure that mining policy is fair and stable by allowing investors an enabling environment in which to mine. Some of the lessons from the DRC are;

i. A fairly stable policy and legal framework.
ii. Creation of a stable macro-economic for business to thrive.
iii. The stable and competitive tax regime.
iv. A conducive and friendly investment policy and legal framework.

Lessons from Botswana

When it comes to developing mining policies that will benefit both the country and the investors, Zambia needs not only to look at countries from afar, like Chile and Peru as it has a ready example in its next-door neighbour Botswana. Botswana is one of the few countries in sub-Saharan Africa that has managed to greatly benefit from its mineral wealth. Research done by the South African Institute for Racial Relations (SAIRR) highlights the following as some of the success factors in Botswana's mining sector; it's mining policies which are predictable, competitive and stable, simple criteria for granting mining rights, no arbitrary cancellation of mining rights, no free participation by the state and low levels of corruption which makes Botswana one of the most attractive mining destinations in the world.

If Zambia will benefit from its mineral resources, it should learn from Botswana by making its mining laws "predictable, competitive and stable". Success in the mining sector in Zambia, therefore, depends on the successful implementation of key reforms, some of which have been on the agenda for some time. Recent declarations in the 2023 National Budget of the Government's intentions to bring Zambia in line with international best practices such as the restructuring of the mineral royalty regime are a step in the right direction, but still, a lot more needs to be done.

5.0 KEY POLICY RECOMMENDATIONS FROM BEST PRACTICE

The following is the summary of recommendations from Best Practice:

- Promote a mining tax regime that is relatively stable, Zambia's mining industry would greatly benefit if it adopts a tax regime that is stable, predictable and competitive as over the last decade the changes in the tax regime have resulted in the sector losing out consequently on major investments hindering mining expansions and explorations.
- Promote an open and stable mining regulatory environment that guarantees FDI inflows in the sector such as foreign investment law that guarantees the security of foreign and domestic investments. Those especially discourage the sudden nationalization of mining operations and protect investor property rights.
- There is need to invest in excellent geological information that will help the country attract investments through the budget for minerals explorations and development in the sector.
- There is need to ensure the country reduces the incidence of corruption which negatively affects investments and operations of the sector.

6.0 PROPOSED REFORMS FOR THE ACTUALIZATION OF THE 3 MILLION METRIC TONNES OF COPPER IN A DECADE

i. **Revision the Legal Framework for Public Private Partnership:** To leverage on Public Private Partnership (PPP) financing for developmental projects, the Public-Private Partnership Act No. 14 of 2009 must be quickly revised to, among others, strengthen the framework for managing fiscal risks, such as fiscal commitments and potential contingent liabilities. Despite the promise of PPP models, Zambia is currently falling behind when it comes to securing and completing PPP projects, which presents a missed opportunity. The PPP model of development is a key option in the undertaking of mining explorations, and infrastructure needed to support the 3 million metric tonnes in a decade such as roads and railways as well as the energy sector.

ii. **Development of an Exploration Strategic Plan:** To encourage mapping for high-quality geological mapping, the Government must consider developing and launching an ambitious and well-funded strategic geology plan for improving knowledge, especially on copper and other minerals that will support diversification. The development of the geological strategic plan offers an opportunity for Zambia to tap into European Union funds allocated for geological mapping for nuclear and similar minerals.

iii. **Education Reforms:** There is a need to embark on educational reforms that promote skills and competencies needed in the mining sector to reduce on importation of skills. In addition, the Government can consider Incentivizing education services that match industry needs to be focused on transferable competencies to other sectors like agriculture, construction, and manufacturing.

iv. **Debt Restructuring:** As indicated in the challenges that Zambia has a high-risk premium that makes borrowing on the international market very expensive. There is need for the International Monetary Fund (IMF) package that Zambia is accessing to be supported by debt restructuring which will give confidence to investors to invest in the sector. The recent debt restructuring under the G20 framework provides Zambia with some relief for Investment. Nonetheless a full debt restructuring including the debt owed to private individual such as euro-bond holders is significant in achieving the much needed investments required to attain the 3 million metric tonnes aspirations. The International Monetary Fund facility and debt restructuring offers an opportunity for lowering the risk premium to acceptable levels. For instance, when Ghana accessed the IMF facility, it offered a letter of comfort to investors and subsequently assisted in lowering the risk premium of the country.

v. **Development of a Master Plan:** In order to actualize the aspirations of the 3 million metric tonnes of copper in a decade. There is need to develop a master plan that will explicitly spell out critical requirements, constraining factors, success factors, indicators, institutional framework and costs requirement for all requirements and proposed sources of funding. Changes to legal and policy framework to support the framework is not a means to the end as these aspirations requires a clear roadmap and responsibilities by all players involved in the copper production value chain. .

vi. **Develop a Legal Framework that Governs the Small and Artisanal Miners:** There has been an increase in the contribution of ASM to the country's annual copper production from about 5000MT per annum in 2017 to 26,000MT per annum in 2021 and potential is there is increase the contribution of this subsector This potential in this subsector must be harnessed not only for quantities but also as a source of Government revenue therefore Government must encourage the formalization of ASM and increase their contribution towards the 3 million metric tonnes by developing a tax regime for ASM. Development of a separate legal framework that support the development of the ASM sub sector will improve not only licensing and formalization but will also improve the sectors access to geological information, access to capital and equipment and also allow for better dialogue within the subsector which will improve their contribution to national development.

vii. **Adoption of Technological Innovations in the Sector:** the adoption of technological innovations in Zambia's copper mining sector is more than urgent especially for mines on the Copperbelt who are grappling with depleting resources, while trying to remain sustainable and competitive at minimal costs. The adoption of these technological innovations will help the mines in Zambia lessen their costs, while increasing their production and improving their mineral recovery amidst the need to increase production to 3 million metric tonnes as a country.

7.0. CONCLUSION

Zambia still has unexploited potential of the mining sector particularly the copper mineral subsector. The major turning point in achieving the 3 million metric tonnes is through raising of investor confidence. This can be achieved through lowering the costs of doing business by paying particular emphasis on tax rates and regimes to make mining sector more attractive. In addition, adopting some of the mining policy reforms from our country competitors by improving and building upon these will catalyse and lead to large scale production of copper in the mining sector. This study also revealed that availability of resources to aid the acquisition of land and machinery will have a positive impact on copper output in the country.

The study concluded that the existing copper mining companies in their current state may not attain the set 3 million metric tonnes of copper production in the next ten years unless the following critical issues are dealt with; Limited life of the mine due to depleted mineral resources, lack of strategic partners to invest in some mines such as Konkola Copper Mines (KCM) and Mopani Copper Mines, unstable and unpredictable mining tax regime, old mining infrastructure which has posed failure to increased copper production, lack of geological and mineral exploration to define new areas for copper mine development. In addition, the existing support infrastructure such as road, railway network as well as critical energy demand (ie. petroleum and electricity) is inadequate to commensurately respond to the set target of achieving the 3 million metric tonnes of copper. However, it will be important for the Zambia to plan and invest in supporting the sector pillars to be able to respond effectively to the quantum increase of the poised copper production in the next decade.

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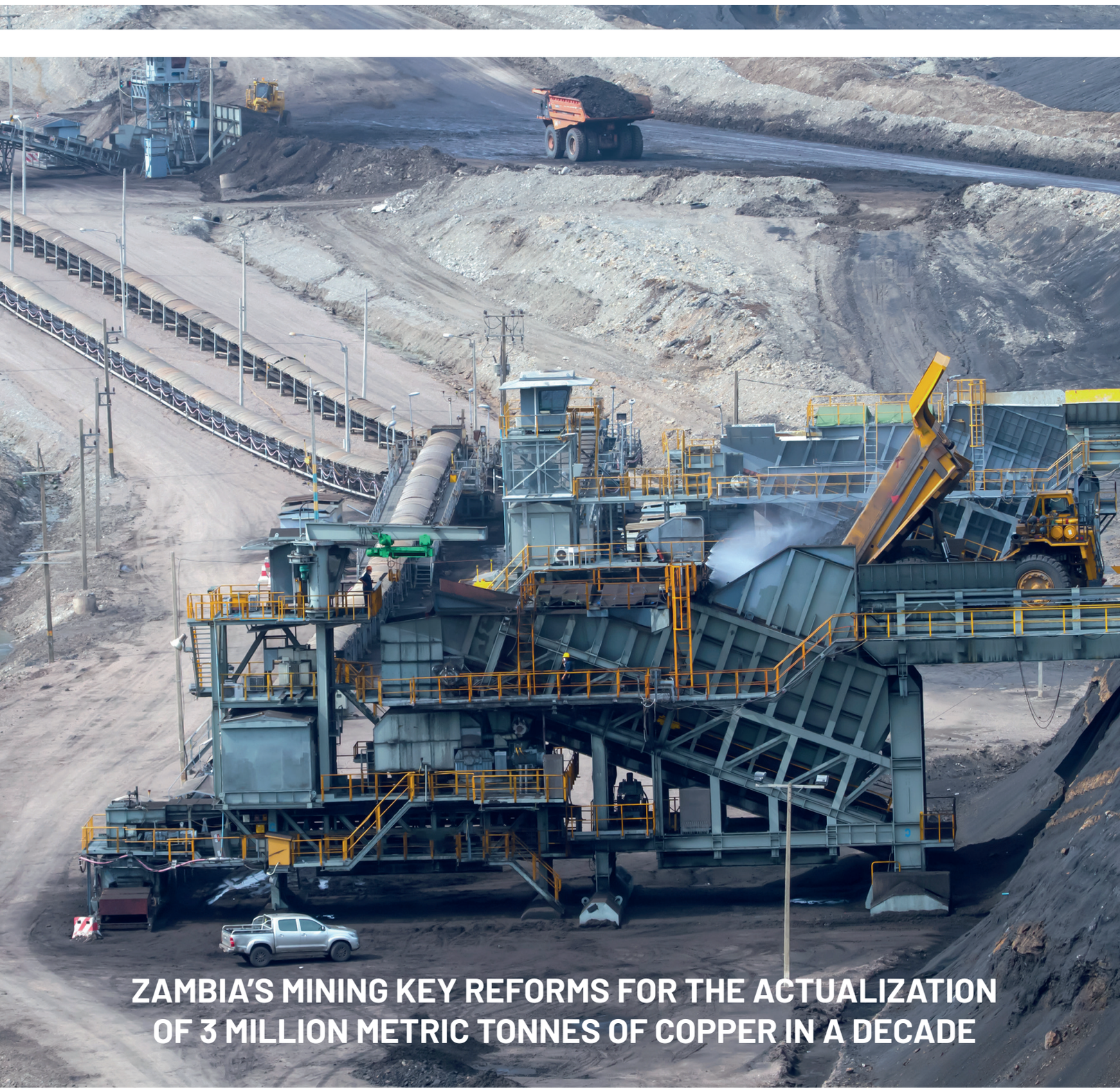

ZAMBIA'S MINING KEY REFORMS FOR THE ACTUALIZATION OF 3 MILLION METRIC TONNES OF COPPER IN A DECADE

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