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AFRICAN DEVELOPMENT BANK GROUP
GROUPE DE LA BANQUE AFRICAINE DE DÉVELOPPEMENT

New Mechanism for Mitigating Currency Risk to Support Africa's Energy Transition

The African Development Bank

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Foreword

Africa has a unique opportunity due to its rich endowment of natural resources and critical minerals that are essential for the world's energy transition: the continent is home to 60% of the world's best solar potential, 50% of the world's wind power capacity, 71.4% of the world's cobalt, 76% of the world's platinum and 58% of the world's manganese. Yet, the continent currently attracts only 3% of global energy investment and 2% of global green energy investments. According to the IEA Sustainable Africa Scenario (SAS), transitioning to a clean energy sector implies almost doubling of total capital over 2026-2030 with investment needs projected to average about USD 200 billion annually.

Most of the financing available for power sector projects today is in hard currency which makes the financing unsustainable in the long-term because of the currency mismatch occasioned by the volatility of local currencies against international hard currencies. Although currency hedging and other options exist, they can be expensive and are lacking for many developing country currencies, particularly at the long tenors, low cost and large scale required to support the needed clean energy investments.

Consequently, the acute challenge of currency devaluation remains problematic because the tariffs for the provision of energy services financed in hard currencies must be adjusted to reflect the decline in revenue received from customers in local currencies. This issue threatens the affordability and long-term sustainability of privately financed Independent Power Projects (IPPs) across the continent and must be addressed as an urgent priority.

This led the African Development Bank Group (AfDB), with support from KPMG Services (Pty) Ltd, to conceive a unique proposition, which relies on the idea that participating African Countries can serve their interests much better by pooling together their mineral resources into a commodity basket to support the establishment of a long-term mechanism to mitigate currency exchange rate and convertibility risk against international hard currencies.

If implemented, such an approach will inter alia:

i. improve the governance framework for trading Africa's critical minerals through a trusted Settlements Agent;

ii. increase the flow of sustainable investments into long-term energy transition projects in Africa; and

iii. support the aims of Mission 300 - the recently launched initiative by the AfDB and World Bank Group to connect 300 million Africans to electricity by 2030.

This report, commissioned by the Energy Financial Solutions Department of the AfDB, proposes a shift in paradigm, with a view to providing sustainable long-term financing for Africa's energy sector. We hope that its information and insights spur market action that enhances the Bank's efforts to catalyze additional financing for clean energy projects in Africa.

Wale Shonibare
Director, Energy Financial Solutions, Policy &
Regulations Department
Power, Energy, Climate and Green Growth Complex
African Development Bank

Glossary of Terms

Term/ Abbreviation	Definition
AEF	Africa Energy Forum.
AfDB / The Bank	African Development Bank.
AGM	Annual General Meeting.
UA **AUA**	**Unit of Account** UAs can be actual currencies, or abstract units, created specifically for accounting and financial purposes. Their primary role is to facilitate economic transactions by providing a stable and universally understood measure of value, independent of the fluctuations of any single currency. **African Unit of Account** The AUA is a unit of account that derives its value against hard currencies through a specially constructed basket of commodities that are traded by African countries.
BIS	Bank of International Settlements.
CCP	Central Clearing Counterparty.
CFA	Communauté Financière Africaine: The CFA franc, backed by the French treasury and pegged to the Euro, refers to the Central African CFA Franc (XAF) and the West African CFA Franc (XOF), and is accepted in 14 member countries.
Commodity basket	A collection of individual commodities, in varying proportions, that together exhibit less volatility in Hard currency (such as the US Dollar) valuation when compared against the individual participating African currencies against the same Hard currency, over an equivalent duration.
Critical and low carbon minerals	Minerals associated with the technology used in the generation, transmission, and storage of renewable and nuclear energy.
DFI	Development Finance Institution.
Downside limit	A threshold that determines the decline in the value of the investment or portfolio below the original invested value. For example, if an investment started with $100, $85 would represent the 15% downside limit.
EM	Emerging Market.
FDI	Foreign Direct Investment.
Funding gap	The difference between the money required to begin or continue operations, and the money currently accessible.
GDP	Gross Domestic Product.
GHG	Greenhouse Gas.
Hard currency	G7 currencies, including US Dollar, UK Pound Sterling, Euro, Japanese Yen, Chinese Yuan, Swiss Franc.
IDA	International Development Association.

Term/ Abbreviation	Definition
IEA	International Energy Agency.
IMF	International Monetary Fund.
Industrial minerals	Industrial minerals include non-metal and non-fuel mineral resources used in various industries based on their physical and/or chemical properties. Examples of industrial minerals include tin, lead, and palladium.
MDB	Multilateral Development Bank.
OPEC	The Organisation of the Petroleum Exporting Countries.
Other minerals and fossil fuels	Other minerals and fossil fuels, as defined for this report, include precious metals and fossil fuels, and exclude industrial, critical and low carbon minerals.
PGM	Platinum Group Metals.
Proven currency reserves	Level of surety agreed to apply to reserves of mineral deposits such that they have sufficient liquidity to be mined and shipped to the potential buyer.
SAS	Sustainable Africa Scenario.
SDGs	Sustainable Development Goals.
Special Drawing Right (SDR)	The special drawing right (SDR) is an international reserve asset created by the IMF to supplement the official reserves of its member countries. The SDR is not a currency. It is a potential claim on the freely usable currencies of IMF members. The value of the SDR is based on a basket of five major international currencies, including the US Dollar, Japanese Yen, Euro, British Pound, and Chinese Yuan.
Settlements agent	Independent pan-African organisation that will receive the debt service from borrowers in local currency and pay Hard currency to lenders using the pool of commodities to raise liquidity.
Special funding window	Donor funded; blended financing facility that aims to make funding more affordable for its less developed members.
VaR	Value at Risk.
Volatility	Volatility is represented by the annualised standard deviation of the returns and refers to the degree of variation or fluctuation in the price of a financial instrument or asset such as a commodity.

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Executive Summary

1. Executive summary

1.1 Background

Africa is at the heart of the green energy transition, as vast reserves of many of the critical minerals required to power the clean energy transition are located on the continent. This gives Africa a key opportunity to leverage the global demand for those minerals while reducing the funding gap and helping the continent meet its development objectives.

In 1957, Jean Monnet and Robert Schuman dreamt of a Europe linked by coal and steel, protected from war by the benefits of inter-country cooperation. They could not have foreseen how successful the dream would become, and how effective uniting key countries around a common market for those commodities would be to deter war and enable economic prosperity.

The 1960s saw the development of OPEC, an organisation enabling the cooperation of leading oil-producing nations, to influence the global oil market. Member states leveraged their commodity wealth to power economic development, which ultimately enabled a few oil-rich countries to change the trajectory of their economic destiny.

Today, the imperative to reduce Greenhouse Gas (GHG) emissions through reliance on clean energy is driving another massive transformation - the demand for critical minerals needed for the green energy transition. This creates an opportunity for the African continent to leverage its critical mineral wealth and fast-track economic transformation.

Amidst some rapid changes, there are a few facts that are not going to change over the next 30 years:

- Demand for critical minerals will continue to grow.
- Africa is home to approximately 30% of the critical minerals needed to power the energy transition.
- The pressure to reduce GHG emissions and maintain temperature growth below 2°C is not going to abate.

The central questions are: how will the continent leverage its mineral wealth to attract more investment, and which key objectives will it pursue?

This report suggests a mechanism that enables the continent to leverage its mineral wealth and to attract financing at a lower cost.

This is achieved through shielding lenders and investors from the dual currency and convertibility risks that currently constrict international investors' appetite for investments in transformational projects at scale. This report proposes a mechanism that mitigates these risks, relying on the fact that a basket of critical commodities holds its value better than any African currency. Using a non-circulating currency underpinned by such a basket to finance clean energy projects in Africa could reliably mitigate the currency and convertibility risks embedded in such projects. This significantly reduces the high cost of financing paid by most African countries and creates an opportunity for a substantial rise in foreign direct investment into the continent.

Figure 1 Introducing a paradigm shift in Africa's financing for infrastructure

This report sets out a new approach to mitigating project-related exchange rate and currency-convertibility risk under which:

- African countries pool critical commodities to back a new non-circulating borrowing currency that is more stable than individual local currencies.
- There is a positive correlation between the mineral wealth and the economic outlook of commodity-rich countries.
- The premium paid by borrower countries presenting a higher currency risk is managed downwards by innovative approaches that are grounded in the supply and demand dynamics of critical commodities.
- The lessons learned from the gold standard mechanism are used to define a commodity-based currency.
- Insights from existing currency pegs on the continent such as the CFA-Euro are dissected and repurposed.
- The robust governance mechanism of supranational is used to.

1.2 Purpose of the report

This report investigates and develops the functional underpinnings for the concept originating from the African Development Bank (AfDB) of an innovative currency convertibility mechanism that leverages the natural resource endowments of African countries.

Africa requires significant financing for development and growth initiatives, especially if the pace of achieving these goals is going to be accelerated. According to the AfDB's Ten-Year Strategy[1] Africa will need to prioritise its investment into key Sustainable Development Goals (SDGs), including education, energy, infrastructure, and productivity to fast-track its structural transformation. To invest strategically in these areas would require closing a total funding gap of just over $400 billion[2] per year, which will be challenging, given Africa's fiscally constrained environment.

The continent currently accounts for only 3% of global energy investment, and a mere 2%[3] or around $40 billion, of the world's spending on clean energy in 2024. This pales in comparison with India or Latin America, where clean energy investments are estimated at around $70 billion in 2024 each, and far behind China's estimated investment of $675 billion. The AfDB, in its Ten-Year Strategy, estimates that Africa would require a total investment of around $200 billion[4] each year to 2030 to achieve only SDG 7 goals - access to affordable, reliable, sustainable, and modern energy. In line with SDG 7, the African Development Bank is partnering with the World Bank Group and others on an initiative known as Mission 300, which aims to connect 300 million people to electricity in Sub-Saharan Africa by 2030. This goal also aligns directly with one of the AfDB's high-5 operational priorities, namely *Light up and Power Africa*. Raising the required financing would be a substantial increase from the current level of around $90 billion[5], and meeting this challenge would require a combination of financing sources including IFIs, international lenders, local lenders, investors and developers. In addition, it should be noted that undue reliance on financing using Hard currency such as USD or EUR has proven to be unsustainable.

African countries must maintain urgency to progress along their unique development pathways in a sustainable manner.

To do so, the continent could pool its natural resources to allow the leveraging of these pooled resources to raise financing for its much-needed investment in energy and other developmental infrastructure. This would necessitate a shift in Africa's project-financing paradigm.

Developing innovative financing mechanisms to narrow the funding gap while simultaneously leveraging the natural resource wealth of Africa would assist in accelerating Africa's development agenda. It would also encourage African countries to develop their resource sectors and increase the benefits accruing from their resource endowments through gaining greater global influence and control in these markets.

1.3 Outline of the report

This report introduces an innovative exchange rate and currency-convertibility risk mitigation mechanism to mitigate exchange rate and currency convertibility risk to facilitate financing for clean energy infrastructure projects in Africa. It introduces the use of a non-circulating currency backed by a basket of critical commodities and a Pan-African settlements agent. The mechanism would assist resource-rich African countries to reduce the costs of capital through currency risk mitigation. It will also promote regional financial integration, cooperation, and cross-border trade.

The proposed currency convertibility mechanism would be characterised by the following features:

- The idea borrows from the Gold Standard that anchored global currency stability, before and after the Second World War, and is modelled after the Bank of International Settlements (BIS) that bought and sold gold on behalf of participating central banks. It further builds on the CFA-Euro peg in Francophone countries, which is backed by a pledge of external reserves.
- Under this mechanism, participating African countries would pool a pre-agreed percentage of their natural resource endowments, particularly the critical minerals required to generate, transmit and store renewable energy, to facilitate long-term borrowing for clean energy projects.
- Participating countries would pledge a pre-agreed proportion of its proven commodity reserves to a diversified commodity basket that would underpin the convertibility of the local currency cash flows, generated by projects to Hard currency to facilitate debt servicing.

[1] African Development Bank Group. *The Ten -Year Strategy 2024-2033*, 2024.

[2] African Development Bank Group. *African Economic Outlook 2024*. p.iv

[3] International Energy Agency in collaboration with African Development Bank Group. *Financing Clean Energy in Africa*. p.24

[4] International Energy Agency in collaboration with African Development Bank Group. *Financing Clean Energy in Africa*. p.23

[5] International Energy Agency in collaboration with African Development Bank Group. *Financing Clean Energy in Africa*. p.23

- International banks and DFIs would provide loans to energy infrastructure projects in participating countries in hard currency with a stable exchange rate to a non-circulating currency - otherwise known as African Units of Account (AUA) - with both lender and borrower choosing to work through a Settlements Agent.
- The AUA will allow convertibility into hard currencies and local currencies of participating countries, offering stable exchange rates to lenders and borrowers.
- The amount of loans supported by this mechanism in each country will be limited by the value of the commodities pledged by that country.
- A settlements agent will receive the debt service from borrowers in local currency and repay lenders, using the basket of commodities to raise liquidity in hard currency.
- Ultimately, the local currency proceeds from the debt service collected by the settlements agent from local borrowers will be used to repay the participating country for commodities sold through the settlements agent to raise Hard currency liquidity.
- Additional capital can be provided to the settlements agent by a variety of shareholders, including participating African countries, the consumer nations (typically the Global North and China), and other emerging market (EM) countries.

This mechanism would create a special currency convertibility window supporting investments into Africa's clean energy infrastructure.

- Section 2 of this report provides the background and relevant parameters associated with the currency convertibility mechanism and highlights what is included as part of the analysis presented.
- Section 3 of this report presents current and projected macro-economic performance, developmental needs and goals, and the associated funding gap. This section provides a justification for the proposed currency convertibility mechanism and highlights how it aligns with the broader AfDB strategy.
- Section 4 sets out the analysis that underpins the development of a commodity basket. It also includes analyses of the commodities proposed to be included in the basket and the future value of these commodities in the context of the global transition towards green energy.
- Section 5 describes the structure of the proposed currency-convertibility mechanism and its constituent components, including the AUA and the settlements agent.
- Section 6 sets out risk-mitigation strategies that are relevant to the structure of the new currency convertibility mechanism and how the settlements agent might deploy these strategies.
- Section 7 provides a summary of the report. It also illustrates the potential implications of the proposed currency convertibility mechanism and highlights its benefits for participants.

1.4 Expected outcomes

The primary benefit of the proposed currency convertibility mechanism would be to allow participating African countries far greater access to much needed development financing that would help to bridge the current funding gap. The heightened inward investment would support domestic growth and development in these countries, as well as the pursuit of the UN's Sustainable Development Goals (SDGs).

It would allow growth and development-oriented projects in Africa to access financing from international lenders whilst mitigating currency and convertibility risk. Financiers would lend in Hard currency while project sponsors would repay loans in local currency. A settlements agent will facilitate the required convertibility through its management of the commodity basket.

In addition to increased access to financing, the currency convertibility mechanism should also allow African countries to negotiate better loan pricing and more favourable terms by mitigating the exchange-rate and currency convertibility risks associated with the servicing and repayment of Hard currency loans with local currency revenues. This is important; many countries in Africa are fiscally constrained, and the proposed mechanism circumvents this constraint as no additional government guarantees would be required to support loans from international financiers.

The requirement that participating countries must pledge to trade a portion of their natural resources via the settlements agent, to access this currency convertibility mechanism has an added advantage: it incentivises domestic natural resource exploration and extraction, which should further contribute towards economic growth within participating countries.

A key outcome of this mechanism will be that it consolidates and converges the strategic economic interests of the participating African economies that will benefit from the reduced cost of financing driven down by lowered currency and convertibility risk.

They would also benefit from a stronger bargaining position in the trading of their resource endowments, akin to the strengthened positions followed by accelerated economic growth of various European countries after they had signed the Treaties of Rome to establish a common market in 1957.

1.5 Key discussion points

- Africa's recent economic performance
- The need for additional development finance
- Relationship between Africa's climate funding and natural resources
- Economic performance of commodities and currencies
- Development of the commodity basket
- Proposed innovative currency-convertibility mechanism
- Role of settlements agent

02

Background

2. Conceptual building blocks

2.1 Introduction to the analysis

AfDB has, for many years, considered alternative approaches to assisting African countries with constraints related to financing their large infrastructure projects. The issues include the high cost of financing driven by currency depreciation and convertibility risk, high country-risk premiums, and liquidity risk. Exploring an innovative approach to mitigate these risks, the bank has initiated an ambitious initiative to assess and develop a currency convertibility mechanism that leverages the natural resource endowments of participating African countries.

The study builds on the proposals contained in the International Energy Agency's (IEA's) Sustainable Africa Scenario (SAS) for transitioning to clean energy.

Figure 2: Nuances of financing in Africa

With this understanding in mind, it was determined that there was a strong case for rethinking how clean energy projects in Africa are financed. Making this case requires being cognisant of certain factors:

- African countries require access to long-term sustainable finance that preserves affordability of electricity tariffs. Access to international finance may be enhanced if currency risk is mitigated.
- There is a need for African countries to pool and leverage their natural resource endowments in ways that encourage providers of international capital to invest in projects that earn revenues in local currency, without the need for government guarantees, which African countries are increasingly unwilling and/or unable to provide.
- Africa's rich endowment in critical "green" minerals can be monetised to the continent's benefit in new ways that avoid repeating past mistakes.

Based on these considerations, this analysis aims to test the hypothesis that some African countries can avoid direct long-term borrowing in hard currency for infrastructure projects that generate their revenues in local currency. Instead, they can pool their natural resources to facilitate borrowing in AUAs whose value will be more stable against international hard currencies.

The AUA is similar to the Special Drawing Rights (SDR) of the International Monetary Fund (IMF). The AUA will be backed by a basket of commodities and will maintain stable exchange rates against international currencies as well as African local currencies. A settlements agent will manage the AUA. An initial selection of resource-rich African countries would make use of the AUA, having pledged to trade a part of their proven commodity reserves via the settlements agent.

2.2 Definition of the mechanism

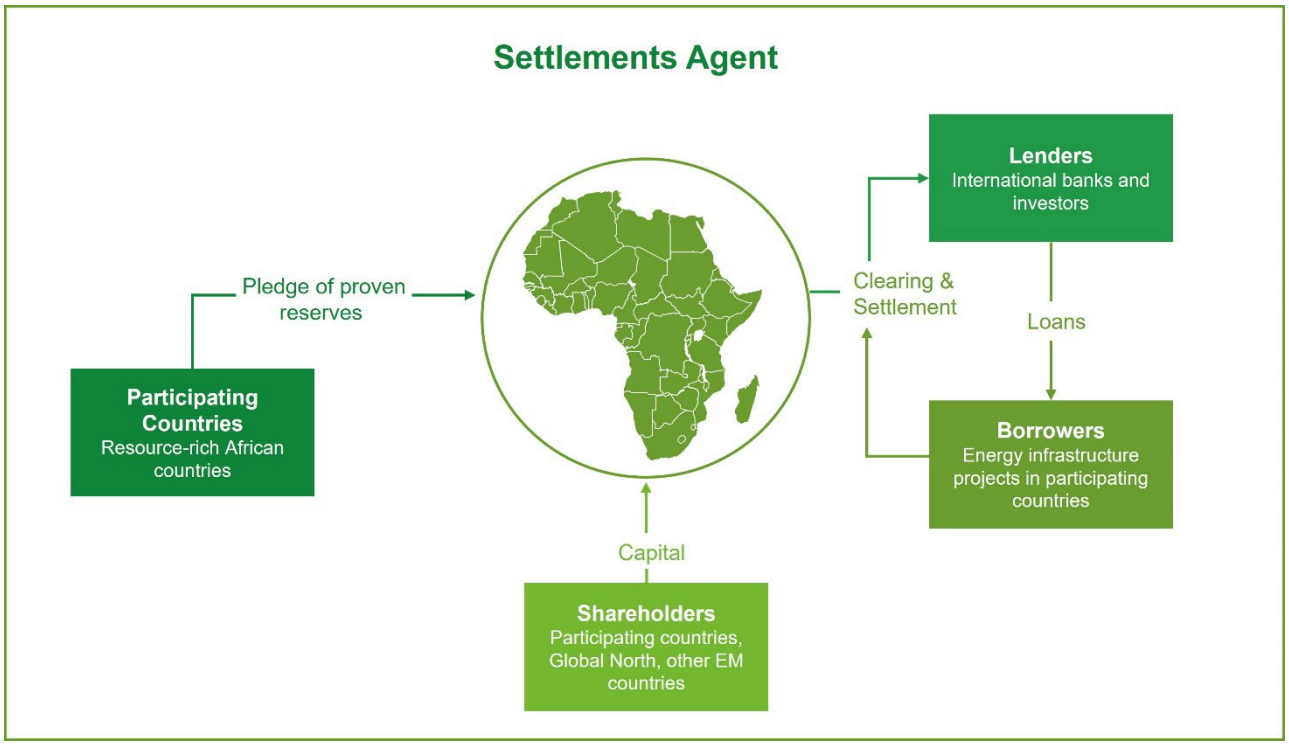
A new mechanism is proposed to help mobilise financing for clean energy infrastructure, through the establishment of a pan-African settlements agent using a non-circulating currency that is backed by a basket of commodities.

It is proposed that the new mechanism will be used by resource-rich African countries to lower their currency convertibility risks and to reduce the cost of capital for development projects. Through the pooling of resource endowments and particularly critical mineral wealth, participation in the mechanism will also promote regional financial integration and cross-border trade.

2.2.1 Context

- Africa needs to find a way of pooling its natural resource endowment and leveraging them to strengthen African countries' ability to borrow long-term and accelerate development.
- Some African countries already forward-pledge a portion of their natural resources to countries such as China and to international trading houses to secure investment in infrastructure. These deals are, however, often opaque and shrouded in secrecy giving rise to questions regarding equity and fairness.
- At the same time, the global demand for critical and low-carbon minerals continues to grow as countries transition energy systems away from fossil fuels. Africa needs to position itself to be able to take advantage of the opportunities that these developments present. The continent's natural resource wealth needs to be valued accurately and leveraged to secure long-term investment to fast-track its development.
- The new mechanism borrows from the Gold Standard. The Gold Standard used bullion as an anchor for global currency stability in the years surrounding the Second World War. The settlements agent function is modelled on the role of the Bank of International Settlements, which was established in 1931 to buy and sell gold on behalf of central banks around the world. It further builds on the CFA-Euro peg in Francophone countries, which is backed by a pledge of external reserves.

Figure 3: Basic structure of the proposed mechanism



Source: African Development Bank

A settlements agent serves as a key institution within the financial ecosystem, ensuring the seamless execution and completion of financial transactions between parties. A settlements agent's primary function is to act as an intermediary that facilitates the transfer of funds and securities, thereby minimising risks and enhancing the efficiency of the financial markets.

2.3 Settlements agent

2.3.1 Structure of the settlements agent

The settlements agent will be an international institution capitalised and owned primarily by commodity-rich African countries. The settlements agent might be piloted initially by a Multilateral Development Bank (MDB) such as the African Development Bank, or a Development Finance Institution such as AfreximBank or the African Guarantee Fund. The governance of the settlements agent will be defined within a model that guarantees the sustainability of the mechanism.

2.3.2 Functions of the settlements agent

2.3.2.1 Maintaining Stable Exchange Rates and Conversion of AUA to Hard and Local Currencies

The settlements agent will handle the intricate process of ensuring that Hard currency liquidity is available to meet debt service obligations when due, by trading or leveraging commodities in its procession. Furthermore, the settlements agent will ensure that, through careful management of the composition of the commodity basket, the weighted average value of the basket remains stable (or appreciates) against the Hard currencies.

2.3.2.2 Clearing services

The settlements agent will provide clearing services by receiving commodities from participating African countries and paying for these commodities over time as local currencies are received from borrowers in participating African countries. The settlements agent will define borrowing limits per participating African country to ensure that the total value of loans being processed through the settlements agent never exceeds the value of the commodities pledged by the participating African country.

Refer to section 5.2 for additional detail on the settlement agent.

2.3.2.3 Custodial and logistical services

The settlements agent will provide custodial services and will safeguard commodities and funds on behalf of their clients if necessary. This ensures that assets are protected and readily accessible when needed for settlement.

The settlements agent will also ensure logistical details needed for taking custody and delivering commodities are contracted appropriately between engaging parties.

2.3.2.4 Risk management

Through overseeing the settlements process, the settlements agent will mitigate various risks, including counterparty risk (the risk that the other party may default) and settlement risk (the risk that one party fails to deliver the commodities or funds as agreed). They could employ mechanisms, such as collateral requirements and netting arrangements, to manage these risks effectively.

2.4 Units of account (UA)

2.4.1 Introduction

A unit of account (UA)[6] serves as a standard for denominating the prices of goods and services, and the values of financial instruments and non-financial assets. This function of money enables a consistent comparison of values, facilitating the preparation of financial accounts and economic decision-making. UAs can be actual currencies, or abstract units, created specifically for accounting and financial purposes. Their primary role is to facilitate economic transactions by providing a stable and universally understood measure of value, independent of the fluctuations of any single currency.

2.4.2 How units of account work

- **Valuation**: UAs provide a stable reference for valuing goods and services. For example, if a country's currency is highly volatile, transactions and contracts might be denominated in a UA to avoid the risks associated with currency fluctuations.

[6] J.M Cartas and A Harutyunyan: Monetary and Financial Statistics Manual and Compilation Guide (2017)

- **Comparability**: UAs enable the comparison of financial statements and economic data across different currencies and regions. This is especially useful in international finance and trade, where multiple currencies are involved.
- **Risk Management**: When using a UA, organisations and countries can manage exchange-rate risk more effectively, particularly in long-term contracts or loans.
- **Accounting**: For international organisations, UAs serve as a standard currency for financial reporting, ensuring consistency and simple comparability in their financial statements.

2.4.3 Deployment of units of account by international organisations

2.4.3.1 African Development Bank (AfDB)

The African Development Bank (AfDB) also uses a UA for its operations. The AfDB UA is equivalent to the IMF's SDR and is used for accounting purposes across the bank's operations, including the issuance of loans, financial reporting, and other financial activities.

Functions of the AfDB UA:

- **Loan issuance:** Loans provided by the AfDB are denominated in UA, reducing currency risk for the bank and the borrowing countries.
- **Operational consistency:** The use of UA helps to maintain consistency across the AfDB's operations, which is particularly important given the diverse range of currencies on the African continent.
- **Financial reporting:** Like the IMF and World Bank, the AfDB uses UA in its financial statements to provide a clear and standardised measure of its financial activities.

2.4.3.2 International Monetary Fund (IMF) and Special Drawing Rights (SDRs)

The Special Drawing Rights (SDRs), created by the International Monetary Fund (IMF) in 1969, are one of the most prominent examples of a UA. SDRs are an international reserve asset that supplement the official reserves of IMF member countries. SDRs are not a currency. Instead, SDRs serve as a potential claim on the freely usable currencies of IMF member countries. The value of SDRs is based on a basket of major international currencies: the US Dollar, Euro, Chinese Renminbi (Yuan), Japanese Yen and British Pound Sterling.

IMF members, and the IMF itself, hold SDRs. The IMF has the authority to approve other holders, including central banks and multilateral development banks. Individuals and private entities cannot hold SDRs.

Table 1: Special Drawing Rights

Currency	@ July 25, 2016 *SDR1 = US $ 1.38443*		@ August 1, 2022 *SDR1 = US $ 1.329890*	
	Percentage Weights	US Dollar Equivalents	Percentage Weights	US Dollar Equivalents
US Dollar	41.73	0.585450	43.38	0.584480
Euro	30.93	0.424857	29.31	0.387646
Chinese yuan/ renminbi	10.92	0.151205	12.28	0.163411
Japanese yen	8.33	0.117001	7.59	0.098090
Pound sterling	8.09	0.105921	7.44	0.096266

Source: 2016- IMF Press Release No.16/358; 2022 - IMF Executive Board Concludes Quinquennial SDR Valuation Review and Determines New Currency Weights for SDR Valuation Basket

- Currency amounts refer to the number of units of each currency in the SDR basket and play a central role in the daily valuation of the SDR. They are determined on the transaction date and remain fixed over the five years.
- On each business day during an SDR valuation period, the value of the SDR (in US Dollars) is calculated as the sum of the currency amounts, valued at the daily exchange rates of the currencies against the US Dollar.

Functions of SDRs:

- **Reserve asset:** Countries hold SDRs as part of their foreign exchange reserves.
- **Accounting unit:** The IMF uses SDRs as a unit of account for its transactions, including the computation of interest charges, fees, and quotas for member countries.
- **Exchange rate stability:** The use of a basket of currencies to value SDRs reduces the effect of fluctuations in any single currency.

2.4.3.3 World Bank (WB)

The World Bank (WB) uses a UA primarily for accounting purposes, particularly in managing loans and credits. The WB's UA is the International Development Association (IDA) UA. The IDA, which is the concessional arm of the WB, provides low-interest loans and grants to the world's poorest countries. The IDA uses its UA to maintain consistency and comparability in its financial operations.

Functions of the IDA UA:

- **Loan pricing:** Loans provided by the IDA are denominated in UA, ensuring that the repayment obligations of borrowing countries are not unduly affected by fluctuations in the value of any single currency.
- **Financial reporting:** The IDA reports its financial statements in UA, which provides a clear and consistent valuation of its financial activities.

2.4.4 Conclusion

Units of account play an important role in international finance by providing a stable, consistent, and universally recognised measure of value. The IMF's SDRs, World Bank's IDA UA, and AfDB's UA are all examples of how these units are deployed to manage exchange rate risks, maintain consistency in financial reporting, and facilitate international lending and financial operations. The UAs help international organisations to operate more efficiently in a globalised economy, where currency fluctuations and exchange rate volatility can pose significant challenges.

2.5 Gold Standard

During the 17th century, a system through which governments issued banknotes, while guaranteeing their value, was adopted in Europe to a significant extent. To achieve and maintain trust in this type of currency, many countries tied the value of their own money to the gold that they had available, hence introducing the Gold Standard.

The Gold Standard prevented governments from printing money in unlimited quantities and manipulating its value unilaterally. It also reduced the motivation for the State to borrow excessively. This cultivated broad trust in money and the financial system.

Long-term price stability was one of the main benefits of the Gold Standard, as the government could not create money without having the bullion backing it. Consequently, the inflation rate was much lower, and the risk of hyperinflation was significantly reduced.

As the Gold Standard gave unfair advantage to gold-rich countries, gold-deficient economies had to be much more productive than competing with gold-rich countries to maintain the same level of living standard for their citizens.

The system was ultimately abandoned in 1971 at the insistence of then US President, Richard Nixon.

03

Industry Analysis

3. Industry analysis

3.1 Introduction

The industry analysis section of this report explores Africa's current economic conditions, as it strives to fund its growth and development strategy. Estimates of required financing are contrasted against the actual financing received, highlighting a significant development funding gap.

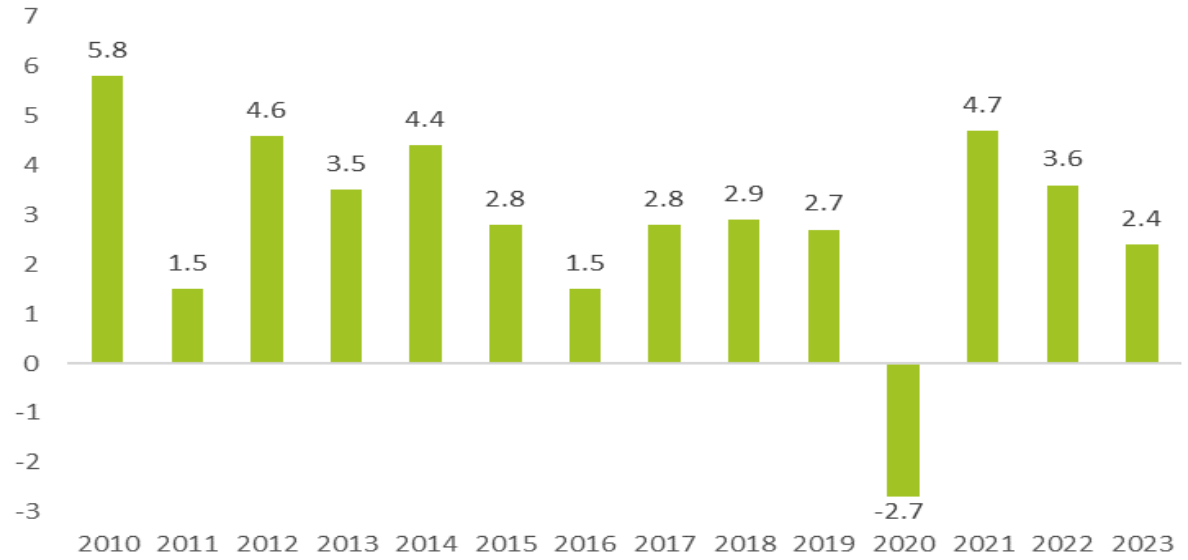
Proposals are provided on how Africa could proceed with its development agenda, by unlocking additional sources of financing and risk-mitigation strategies. These include the proposed new currency convertibility mechanism.

3.2 Africa's recent performance in the context of current and future challenges

African economies have shown great resilience over the last fifteen years. African economies have continued to grow and develop, despite considerable challenges both from within, and from outside Africa. They have achieved an average growth rate of 3.3% over the 10-year period leading up to the 2020 COVID-19 pandemic[7].

Prior to the pandemic, Africa had six of the world's ten fastest growing economies. Much of the growth was based on structural transformation from largely primary sector driven economies to expanding secondary and tertiary sectors. While still benefiting from elevated commodity prices over this period, the implementation of improved domestic policies also contributed to this key economic advancement. Africa experienced increased inflows of foreign direct investment, along with official development assistance and remittances. There was also a rise in foreign borrowing, through global capital markets, to fund growth and developmental initiatives, largely through infrastructure projects.

Figure 4: Economic Growth in Africa (%)



Source: Economics Intelligence Unit, KPMG analysis

The COVID-19 pandemic led to a tightening of the fiscal space as a result of unprecedented health, safety and social expenditure, while economies and government revenues contracted. This occurred while the needs of the continent, in terms of growth and development, continued to grow.

Following the pandemic, geopolitical events contributed to a cost-of-living crisis and a worsening of food insecurity, all contributing to even higher public debt levels. Conflict and political instability within the continent have regressed, while the increase in Africa's youth population continues to outpace the creation of employment opportunities, leading to mass migration to other regions in search of economic opportunities. Finally, the accelerating effects of climate change will continue to affect Africa disproportionately, more than its contribution to this problem. Africa

[7] African Development Bank Group. *The Ten -Year Strategy 2023-2033*, 2024. p.6.

needs to improve its resilience against the effects of climate change. As a result, Africa is off-track to reach most of the United Nations' (UN) Sustainable Development Goals (SDGs) by 2030.

The African continent urgently needs to direct its financial and other resources towards the achievement of the UN SDGs and broadly to the creation of sustainable economic growth and employment. This will not be accomplished unless resources are focused in a targeted manner on removing global and regional barriers to the continent's progress.

The capacity for domestic resource mobilisation to finance the continent's development agenda remains low. Many countries in Africa still face large deficits in the provision of power, water and sanitation, and other growth-supporting infrastructure. These deficits negatively affect the quality of life of Africans, and act as barriers to the development of modern, productive economies. Unequal access to education and skills development, health, safety and security, and other basic services constrain human capital development in Africa.

Efforts to mitigate the impact of climate change and the promotion of climate resilience, all require specific focus. According to the AfDB[8], the effects of climate change are a major contributor to the continent's general fragility. Climate change has wreaked havoc on agricultural output, as a result of changing weather patterns. This, in turn, has had a detrimental effect on food production and citizens' food security. Climate change and its accompanying consequences has also affected Africa's economies.

Declining tax revenues because of climate change effects, combined with the need for greater borrowing to cover projects that may mitigate these effects, along with the consequences of extreme weather events, have put significant upward pressure on public debt. Consequently, the AfDB reports that African debt reached a total of around $1.8 trillion, with 24 countries in debt distress or at risk of debt distress at the end of 2023. Climate change also affects economic growth and employment creation indirectly, through limited access to electricity, clean air and water, which is detrimental for the wellbeing and productivity of the population.

In pursuit of its goals, Africa should focus on its unique and yet untapped assets, including its young and dynamic workforce[9], furthering integration among African economies, its sizable clean energy production potential and natural resource endowments. Through combining these assets, Africa can pursue inclusive green growth policies to drive prosperous and resilient economies.

3.3 Access to Electricity and Mission 300

According to the AfDB, some 600 million Africans, representing around 43% of the continent's population, lack access to electricity, with around one billion Africans lacking access to clean cooking alternatives[10]. To extend electricity to these people will require a threefold increase in the number of connections made annually to around 90 million, a third of which would be through off-grid solutions. Most of the new generation capacity will be from renewable sources.

It has been estimated that to achieve universal access to renewable energy throughout Africa would require at least a doubling of the current rate of energy investment, to approximately $190 billion per year until 2030[11]. In addition to greater financing, the current energy sector in Africa will need to undergo significant transformation to eliminate inefficiencies, poor governance, high operating costs, system losses, and poor revenue collection. Building robust intra- and inter-regional power systems and linking existing power pools will also help to create a sustainable, economical, and dependable African electricity market.

The continent is well endowed with many of the critical and low carbon minerals that are required for the generation, storage, and various applications of green energy technologies. Through building a fundamentally green energy infrastructure to satisfy its energy requirements, Africa can play a key role in reducing the risks that climate change poses.

In line with this goal, the World Bank Group and AfDB have launched the ambitious Mission 300 initiative to connect 300 million people in Africa to electricity by 2030. These projects represent a bolder and more holistic approach by these institutions to tackling Africa's developmental needs. This will involve mobilising public and private sector financing at scale and highlights the urgency and relevance of the new currency convertibility mechanism proposed in this report.

[8] African Development Bank Group. *The Ten -Year Strategy 2023-2033*, 2024. p.56.

[9] According to the AfDB, by 2030 Africa will have an estimated 477 million people between the ages of 15 and 35.

[10] African Development Bank Group. *Annual Developmental Effectiveness Review*, 2023. p.9.

[11] International Energy Agency. *Africa Energy Outlook 2022*.

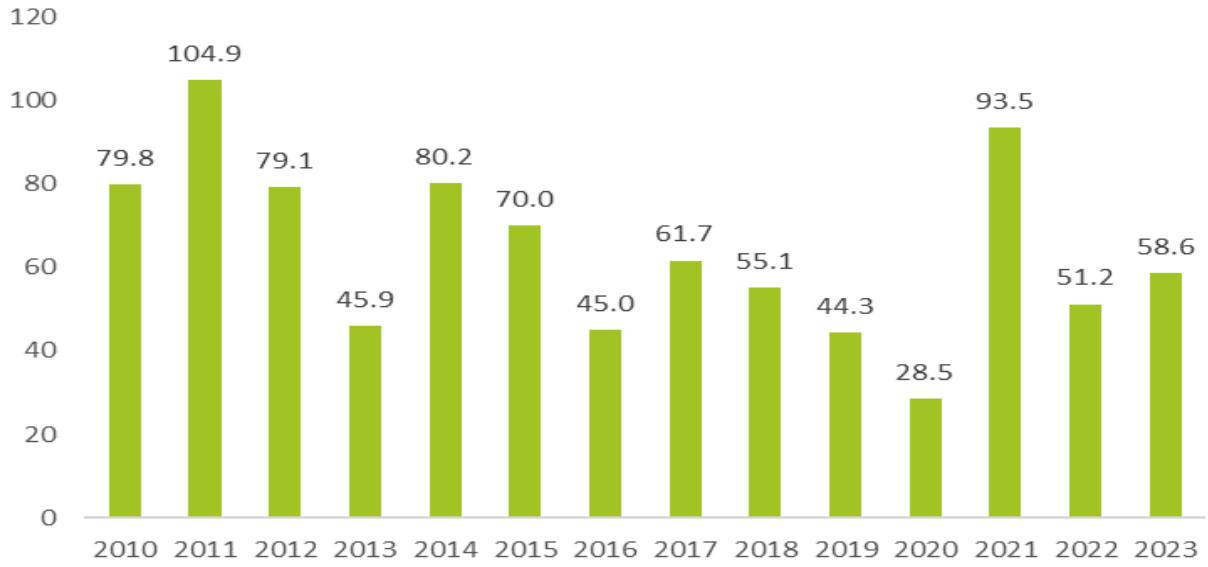
3.4 Africa's financing gap and proposed innovative currency convertibility mechanism

Africa faces a significant funding gap, worsened by the unforeseen expenditure caused by the COVID-19 pandemic. This disrupted the pre-pandemic progress made on economic growth and development. The IMF estimates that it would require around $500 billion, between 2021 and 2025, for Africa to return to its pre-pandemic growth path[12]. Africa currently receives only around 3%, or approximately $30 billion of domestic and international climate finance, significantly below what would be required to achieve its universal access objectives.

As a result, many African countries have sought to close their funding gaps by accepting often riskier financing options, including the issuance of Eurobonds, natural resource backed loans and partnerships with non-traditional donors. Most of the loans involve foreign currency borrowing, increasing vulnerability to economic downturns and risk of currency mismatch, all while the cost of borrowing has increased along with global inflation rates. As a result, the continent's debt-to-GDP ratio has almost doubled over the past decade to 66%, according to the AfDB, with the debt servicing cost consuming an increasing share of country budgets and diverting scarce financing away from vital social and infrastructure spending.

The current fiscal situation remains a constraint on Africa's progress on many fronts. The AfDB calculates that Africa currently only spends 3.5% of its GDP on infrastructure, which is half of the Asian average. Private investors also only account for 10% of infrastructure financing, with the level in public private partnerships declining in recent years.

Figure 5: Inward Foreign Direct Investment in Africa (USD bn)



Source: Economist Intelligence Unit, KPMG analysis

[12] African Development Bank Group. The Ten -Year Strategy 2023-2033, p.52. 2024.

Figure 6: Examples of resource backed loans in Africa

Ghana and Sinohydro	**Loan Details**: In 2018, Ghana entered into a $2 billion bauxite-for-infrastructure deal with the Chinese company Sinohydro. Under this agreement, Ghana secured infrastructure development in exchange for bauxite revenues over a 15-year period. The agreement is structured in phases. The first phase involved an initial $500 million from Sinohydro, with subsequent phases being contingent on the completion and success of the earlier projects. **Infrastructure Provision**: Sinohydro agreed to construct roads, bridges, and other infrastructure in Ghana, with repayment coming from the proceeds of Ghana's bauxite mining operations.
Guinea and China Chalco	**Loan Details**: In 2017, Guinea secured a $20 billion loan from China over a period of 20 years in exchange for bauxite mining rights. The loan is tied to the development of bauxite infrastructure, where China's Chalco (Aluminium Corporation of China) will extract bauxite from Guinea's rich deposits. The loan will be repaid through proceeds from bauxite mining and exports to China. **Infrastructure Provision**: Guinea will use the loan for infrastructure projects, including the building of roads, bridges, energy infrastructure and hospitals. Chalco was granted bauxite mining concessions as collateral for the loan.
Zambia and China	**Loan Details**: Zambia has secured several resource-backed loans from China, primarily using copper as collateral. The loans are repaid through copper exports, with Zambia agreeing to supply Chinese companies with copper production over the life of the loans. China gains rights to future copper production as repayment for the loans and Zambian state-owned entities such as Zambia Consolidated Copper Mines (ZCCM) play a key role in ensuring production is aligned with debt service. Interest rates on these loans varied between 1-3%, with long grace periods (two to five years). Loans are tied to specific infrastructure projects, including the Tazara railway rehabilitation and power plants (such as the Kafue Gorge Lower Hydropower Station). Repayment is in the form of copper exports over 10 to 20 years. **Infrastructure Provision**: These loans have been utilised to finance a range of infrastructure projects, including road construction, energy projects, and public utilities.

It is estimated that, to finance their agreed contributions to reduce GHG emissions, African countries will need $277 billion[13] per year in financing up to 2030, while actual financing accounts for only $30 billion per annum and is concentrated in only a few countries.

As a result of this funding gap, Africa cannot accomplish the mass rollout of renewable energy across the continent that is required to achieve its universal access goal by 2030. A contributing factor to this is also that Africa is not optimising the benefits that should be accruing from its natural resource wealth and specifically the critical and low carbon minerals in its soil. The continent contains around 30% of the world's mineral wealth, with large stocks of many metals and minerals including platinum-group metals, cobalt, diamonds, uranium, and gold. Whereas greater economic benefit and increased country revenue could be derived from adding value to these metals and minerals within Africa before exporting, the continent still largely depends on the export of raw materials.

Given the growing need for financing, the continent will need to enhance its access to affordable and sustainable finance through a combination of deepening its financial sectors, while mobilising and leveraging domestic resources, and vastly expanding the inclusion and contribution of private finance. In addition, innovative financing and risk mitigation structures will need to be found that can complement the other finance raising initiatives. A particular risk mitigation mechanism is proposed in this report and combines two important, and yet underutilised,

[13] African Development Bank Group. The Ten -Year Strategy 2023-2033, p.53. 2024.

advantages that Africa has at its disposal: optimal climatic conditions to generate ample renewable energy and its endowments of critical and low carbon minerals required globally for transition to a green or low-carbon economy.

Through the participating countries' pledges[14], the mechanism would be available to support pre-agreed qualifying transactions to achieve each participating country's energy transition objectives.

Given the value of proven natural resource reserves in Africa, and the anticipation that these values could be driven upwards by the global progression of the green energy transition, it is projected that this mechanism could lead to substantial new financing being made available for Africa's development of energy projects, through a transparent, well governed, and participatory structure. The salient points underpinning this currency convertibility mechanism are explored in further detail later in this report.

3.5 Conclusion

To increase its expenditure on developmental infrastructure and fund its broader developmental agenda, Africa will need substantial investments, including further leveraging of traditional sources of finance, increased private sector participation, and innovative mechanisms, like the commodity-backed currency risk mitigation scheme proposed in this report.

This report also highlights the potential complementary relationship between Africa's energy investment needs and its natural resource endowment. Of particular relevance is the continent's wealth of critical minerals that are expected to appreciate in value as the global progression of the green energy and low-carbon transition accelerates.

The analysis supports that:

- The value of Africa's mineral wealth has shown a growing trend over the past few decades.
- The demand for Africa's minerals, and especially for the critical minerals associated with the global green energy transition, is expected to accelerate as countries pursue their targeted transition to low-carbon economies.
- Africa's mineral wealth is projected to continue its upward trend for the foreseeable future, enabling the revenues made through the sale of these minerals to be leveraged for the financing of Africa's energy investment.

[14] As part of this process an acceptable definition for these reserves will be agreed, such that the pledged reserves will be as near liquid as possible and will have adequate and secure enough logistics and infrastructure to facilitate extraction if required.

04

Development of a Commodity Basket

4. Development of a commodity basket

4.1 Introduction

A commodity basket, for the purposes of this report, is a collection of individual mineral commodities, contributed by different participating countries on the continent, in varying proportions, that together exhibit more stability in value, along with lower volatility than the local currencies of the participating countries. A commodity basket can be compared to a diversified equity index such as the S&P 500 in the US.

The initial analysis aims to test the hypothesis that there is a stable commodity basket that, if well-regulated and transparent, could be used as a mechanism to mitigate local currency mismatch risks related to financing in Hard currencies.

- If the empirical findings substantiate the hypothesis, participating African countries with significant commodity reserves, such as Zambia or DRC, would be able to borrow Hard currency to finance projects that generate local currency revenues without the need for a government guarantee to mitigate currency exchange rate and convertibility risk.
- This mechanism may accelerate economic development through greater access to project financing while benefiting from the potential upside offered by the rise of global commodity prices over time. This enables borrower countries to avoid the convertibility risk associated with repayment of loans in Hard currency, while project revenues are earned in local currency.

This section outlines the methodology of the report, presents the results from the data analysis, and provides interpretations of the currency and commodity behaviour. These insights will ultimately aid in devising effective strategies for constructing a commodity basket that would offset currency mismatch risk for project participants.

We define two quantitative measures to assess commodity and currency behaviour over time, namely appreciation/depreciation and volatility.

Figure 7: Quantitative definitions

Appreciation/depreciation refers to an increase/decrease in the value of an asset over time. If the price of a commodity rises, the commodity is said to have appreciated.

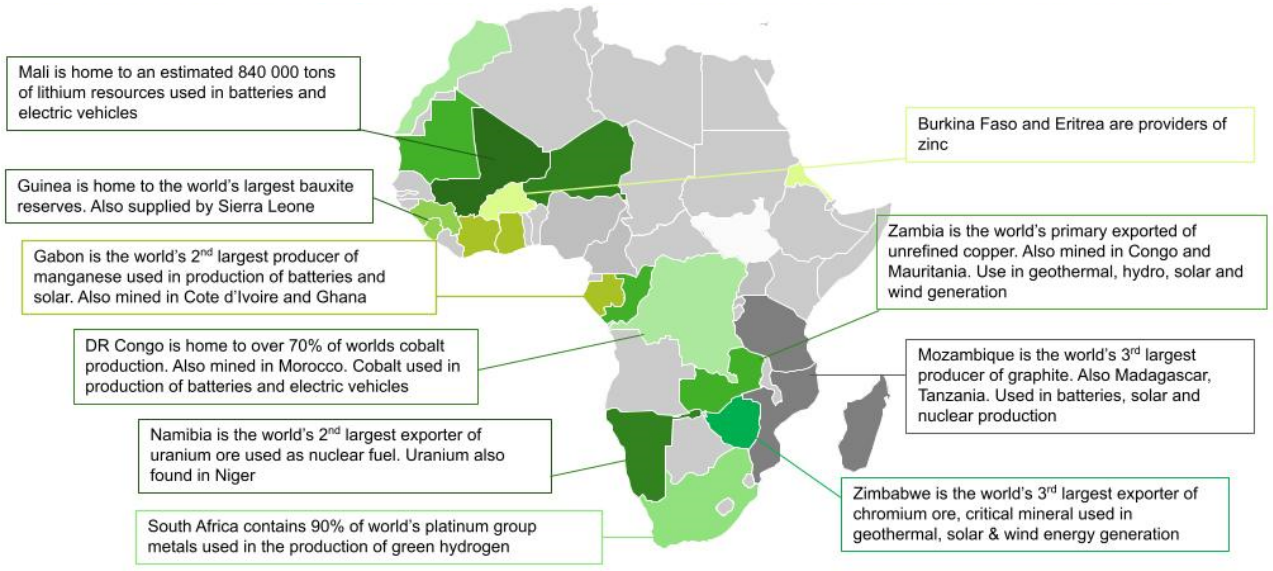
Volatility, as measured by annualised standard deviation, refers to the degree of variation or fluctuation in the price of a financial instrument over a certain period.

All calculations within this section are denominated in a particular country currency, or in the case of commodities, in US Dollars.

4.2 Africa commodity resource analysis

Endowed with vast natural resources, the continent presents an intriguing opportunity for commodity analysis. Africa is estimated to hold around 30% of the world's mineral reserves[15] many of which are critical to the renewable energy generation, transmission and storage, as well as to other low carbon technologies.

Figure 8: African suppliers of low carbon minerals



Africa holds c. 30% of the world's mineral reserves. Many of its minerals are critical to renewable or low-carbon technologies including solar, electric vehicles, battery storage, green hydrogen and geothermal.

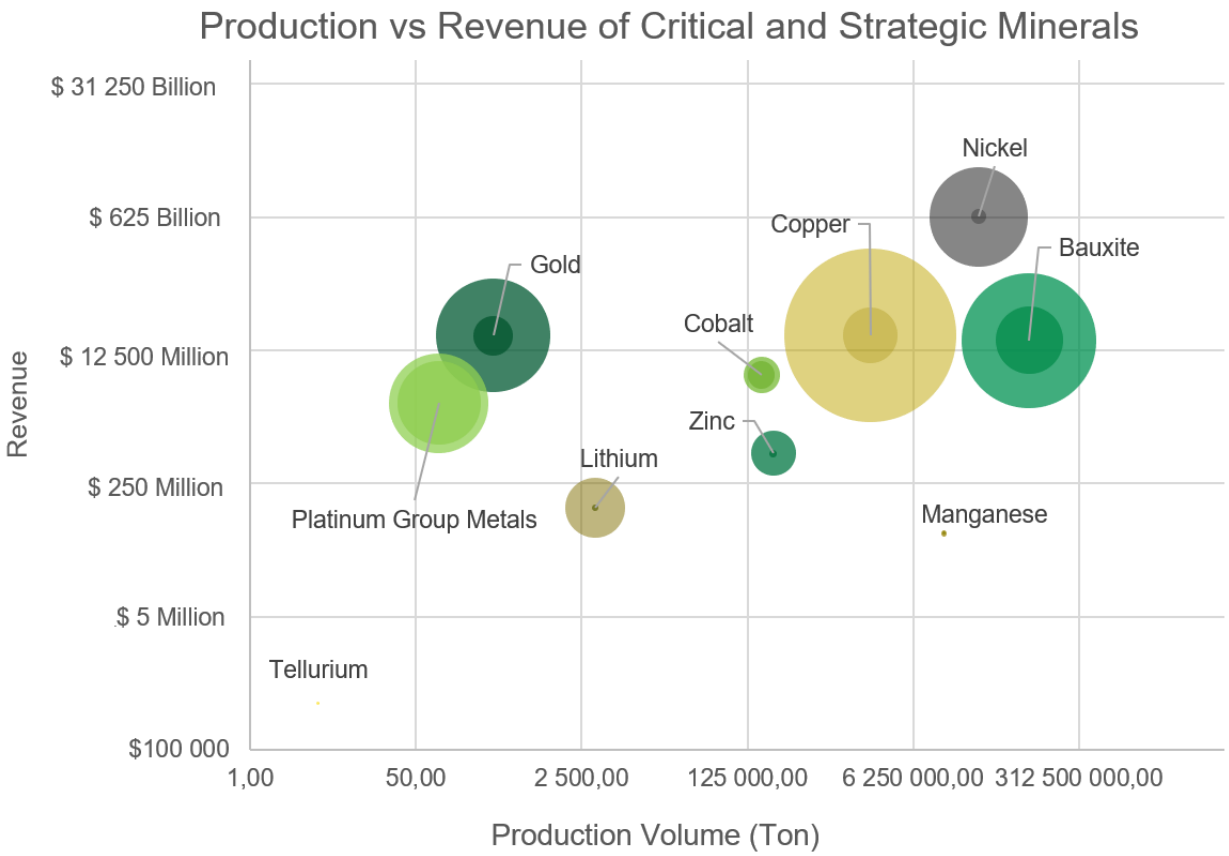
Source: Mo Ibrahim Foundation

The Mo Ibrahim Foundation reports that, to meet the rising demand for such critical minerals, it is expected that the supply of certain metals and minerals, including lithium, graphite, and cobalt, will need to increase by approximately 500% by 2050.

This presents a unique opportunity for African economies, but only if their natural resource wealth can be leveraged in line with their development requirements. As a significant supplier to global commodity markets, understanding the dynamics of Africa's commodities is essential and developmentally strategic, offering a potential competitive edge in future investment and trade decisions.

[15] Africa's critical minerals: Africa at the heart of a low-carbon future. Mo Ibrahim Foundation. 2023

Figure 9: Production versus revenue of critical and strategic minerals



Source: statista.com, pubs.usgs.gov, iisd.org and tradingeconomics.com

The graph above depicts a collection of critical and strategic minerals. Each mineral is represented by two coloured bubbles, comparing African reserves with global reserves. The lighter bubble represents the value of the world reserves, whereas the darker bubble represents the value of African reserves[16]. The graph also shows production volume for each mineral against the revenue for Africa in 2023.

The composition of a basket of Africa's critical and strategic minerals to function as a currency unit or a hedging tool hinges on a few critical resources:

- Cobalt is indispensable due to Africa's dominance in global supply, making it a strategic asset for the basket.
- Nickel plays a role as a substitute for cobalt in battery production, adding flexibility and resilience to the basket, especially when cobalt supply faces risks.
- Copper is crucial for renewable energy infrastructure; given Africa's copper reserves. The metal adds weight and stability to the basket due to its broad use in energy transmission and electrification.
- Bauxite is a strategic addition to an African focused mineral basket, especially given its importance in aluminium production, which is crucial for renewable energy infrastructure like solar panels and lightweight components for electric vehicles. Africa has substantial bauxite reserves: with a market value comparable to other minerals like cobalt or gold, bauxite's utility in clean energy technologies makes it relevant to the green economy.

[16] As estimated in 2023

Lithium and Manganese present some challenges:

- While Lithium is pivotal to the green economy, Africa currently has a low estimated reserve. The complementary relationship between Lithium and Cobalt in battery technology, however, underscores the importance of the role both of these could play in a commodity basket.
- Manganese has large production and reserve volumes but is relatively cheap, limiting its diversification benefit.

In summary, a strong commodity basket for Africa should consider Cobalt, Nickel, Copper as core components. These minerals provide a mix of market leverage, flexibility and stability. Lithium can be included but may not play a dominant role, owing to its scarcity in Africa, while Manganese would have a limited role in balancing risks.

Table 2: Select critical and strategic mineral production values[17]

Metal/ Mineral	Production country	Africa Production (tons)	Global Production (tons)	% of Global
Cobalt	DRC, Madagascar, Morocco	174 000	230 000	75.7%
Manganese	Gabon, Ghana, South Africa	13 030 000	20 000 000	65.2%
PGMs	South Africa, Zimbabwe	86	210	41,0%
Bauxite	Guinea	97 000 000	400 000 000	24.3%
Gold	Burkina Faso, Ghana, Mali, South Africa, Tanzania	310	3000	10.3%
Copper	DRC, Zambia	2 280 000	27 000 000	8.4%
Lithium	Zimbabwe	3 400	180 000	1.9%
Zinc	South Africa	230 000	12 000 000	1.9%
Nickel	South Africa	29 500	3 600 000	0.8%
Tellurium	South Africa	5	640	0.8%

Source: USGS Mineral Commodities Summaries, 2024

Table 3: Select critical and strategic mineral resource revenues[18]

Metal/ Mineral	Average Price per ton (US Dollar)	Africa Reserves (1000 tons)	Global Reserves (1000 tons)	Value of Africa Reserves (million USD)	Value of World Reserves (million USD)	% of Global
PGMs	30 973 000	64	71	1 988 467	2 199 083	90.4%
Cobalt	34 700	6 100	11 000	211 670	381 700	55.5%
Manganese	4	674 000	1 900 000	2 999	8 455	35.5%
Bauxite	173	7 400 000	30 000 000	1 280 200	5 190 000	24.7%
Zinc	2 650	12	74	16 430	583 000	16.6%
Gold	62 372 400	7	59	450 329	3 679 972	12.2%
Copper	8 500	101 000	1 000 000	858 500	8 500 000	10.1%
Nickel	21 500	2 900	130 000	62 350	2 795 000	2.2%
Tellurium	80 200	0.8	36	64	2 887	2.2%
Lithium	35 650	310	28 000	11 362	1 026 200	1.1%

Source: .GS Mineral Commodities Summaries, 2024

This analysis seeks to explore the diverse selection of African commodities, including metals, critical and green minerals, and fossil fuels, to identify a potential combination or basket of commodities that would result in a diversified grouping, with a combination of a more stable or appreciating valuation and lower volatility than any individual commodity.

[17] Data for this table were sourced from statista.com, pubs.usgs.gov, iisd.org and tradingeconomics.com

[18] Data for this table were sourced from statista.com, pubs.usgs.gov, iisd.org and tradingeconomics.com

4.2.1 Methodology applied to select commodities

The selection of commodities for this analysis was guided by an intentional approach anchored in the broader context of the African markets and global economic indicators. Given Africa's vast natural resource endowments, we have focused our study on several metals and minerals, subdivided into four main categories: critical minerals, precious metals, industrial metals, and fossil fuels.

The following list of natural resources was the focus of our analysis: Platinum, Copper, Cobalt, Manganese, Nickel, Uranium, Zinc, Tin, Lead, Palladium, Gold, Silver, Crude Oil, Natural Gas, and Coal.

Several factors influenced our decision in selecting these commodities.

- **Exclusivity and rarity:** The presence and production of certain minerals, including Platinum and Palladium, are largely concentrated in Africa.
- **Global demand:** Commodities, including Copper, Nickel, and Manganese, remain at the centre of growing industrial usage, especially with the rapid rise of technological advancement and the demand for smart devices.
- **Economic contribution*:*** Precious metals, including Gold and Silver, contribute significantly to the revenues of many African economies.
- **Critical and low carbon minerals:** Recognising the pivotal commodity market effect of the transition from fossil fuels towards sustainable energy. These include Lithium, Cobalt, and Uranium.
- **Market liquidity:** The accessibility and liquidity of the market for each of these commodities were also considered, ensuring that selected commodities had active markets with good trading volumes for analysis.

While basket construction may have logistical and legal constraints, this construction sufficiently reflects Africa's diverse commodity landscape.

4.2.2 Analysis of commodities

With Africa being a major contributor to the global commodities market, an in-depth historical review of commodities' appreciation/depreciation and volatility provides a foundation for the research.

Recognising that appreciation/depreciation indicates the profitability of an investment over a given period, and volatility reflects the price fluctuations, together they capture the risk and value growth associated with each commodity.

This analysis will review the market performance of a set of minerals and metals, classified into three categories:

Table 4: Commodity basket categories

Basket #	Basket name	Composition of basket
1	Critical and low carbon minerals	Platinum, Copper, Cobalt, Manganese, Nickel, Uranium, and Zinc.
2	Industrial metals	Tin, Lead, and Palladium.
3	Other minerals and fossil fuels	Gold, Silver, Crude Oil, Natural Gas, and Coal.

By analysing each of these commodities in terms of appreciation/depreciation and volatility, this study aims to understand their individual and collective behaviours, and their potential investment value, in a grouping or basket of commodities.

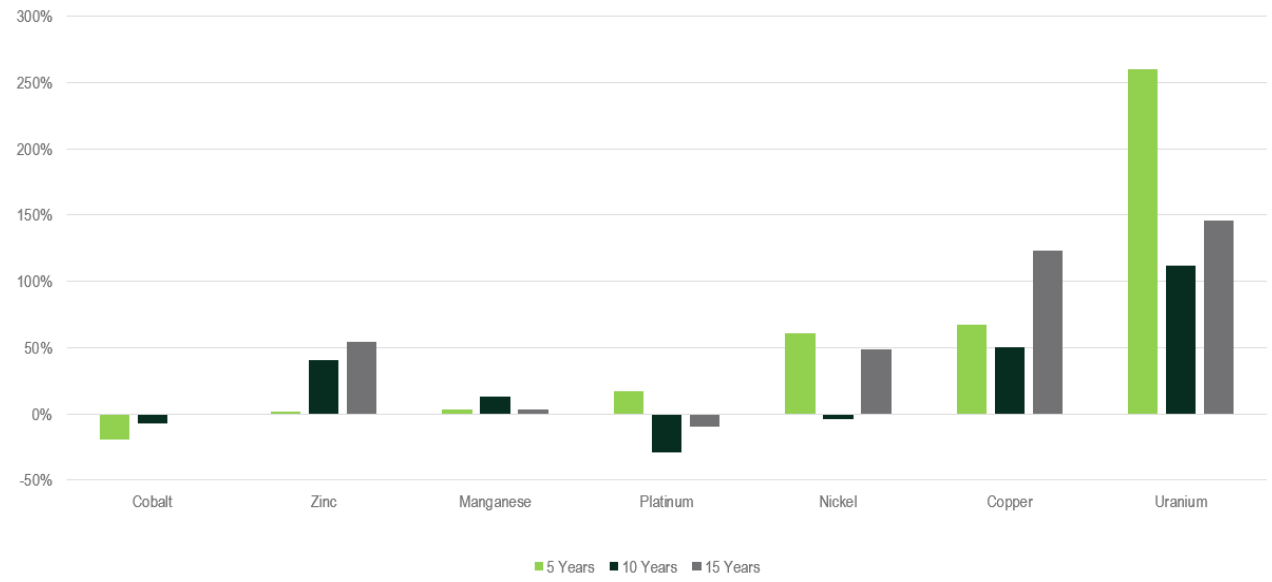
Appreciation/depreciation[19] and volatility observed historically are driven by global supply and demand for the given commodities.

[19] The formula for appreciation and depreciation is:

Appreciation|Depreciation= -End ValueStart Value-1

Positive values correspond to appreciation and negative values correspond to depreciation.

Figure 10: Historic value growth on critical and low carbon minerals

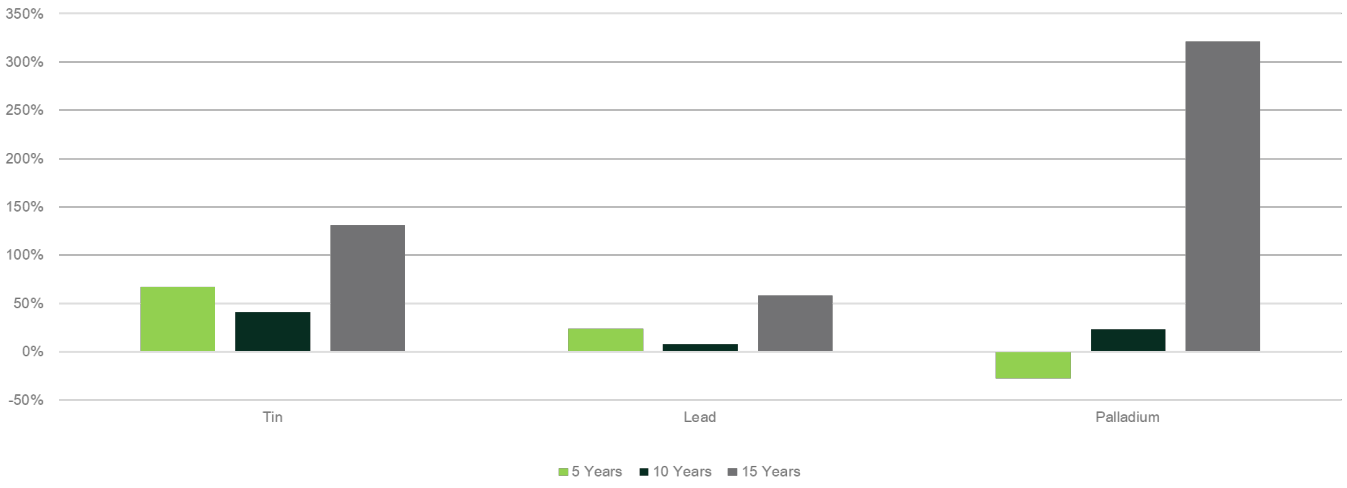


Source: EquityRT, KPMG analysis

The data provided shows the varied performances of the defined critical and low carbon minerals grouping over a 5-[20], 10-[21] and 15-year[22] timeframe.

The critical and low carbon minerals show a wide range of appreciation/depreciation over the different time horizons, not indicating a specific appreciation/depreciation pattern. While there is no clear growth pattern, four out of the seven critical and low carbon minerals show significant appreciation over the 15-year period suggesting that if this trend continues, they could be used as part of a long-term currency risk mitigation commodity basket and that they tend to keep their value over long horizons.

Figure 11: Historic value growth on industrial minerals



Source: EquityRT, KPMG analysis

The graph displays the appreciation/depreciation of industrial minerals: Tin, Lead, and Palladium.

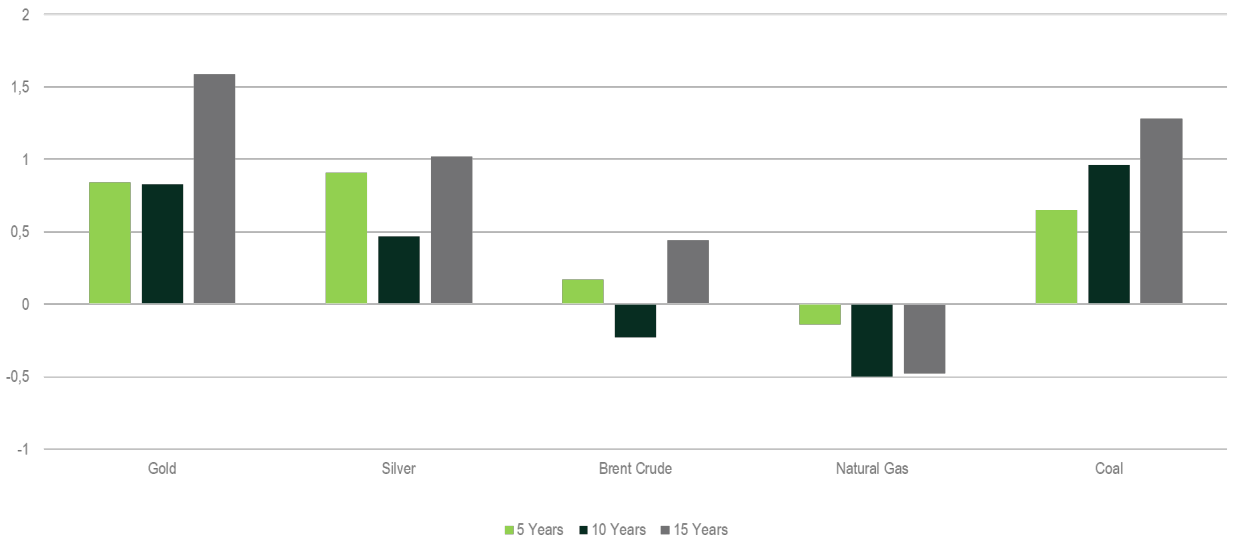
[20] The 5-year period is measured between 2019-05-11 and 2024-05-10.

[21] The 10-year period is measured between 2014-05-11 and 2024-05-10.

[22] The 15-year period is measured between 2009-05-11 and 2024-05-10.

- As with most of the critical and low carbon minerals, the industrial minerals also have higher price appreciation over the 15-year period.
- The relatively high long-term appreciation of the industrial minerals makes them attractive components for a commodity basket aimed towards preserving value over extended periods. These minerals have demonstrated resilience and growth, suggesting they can serve as a hedge against inflation, market volatility, and currency volatility.

Figure 12: Historic value growth on other minerals and fossil fuels



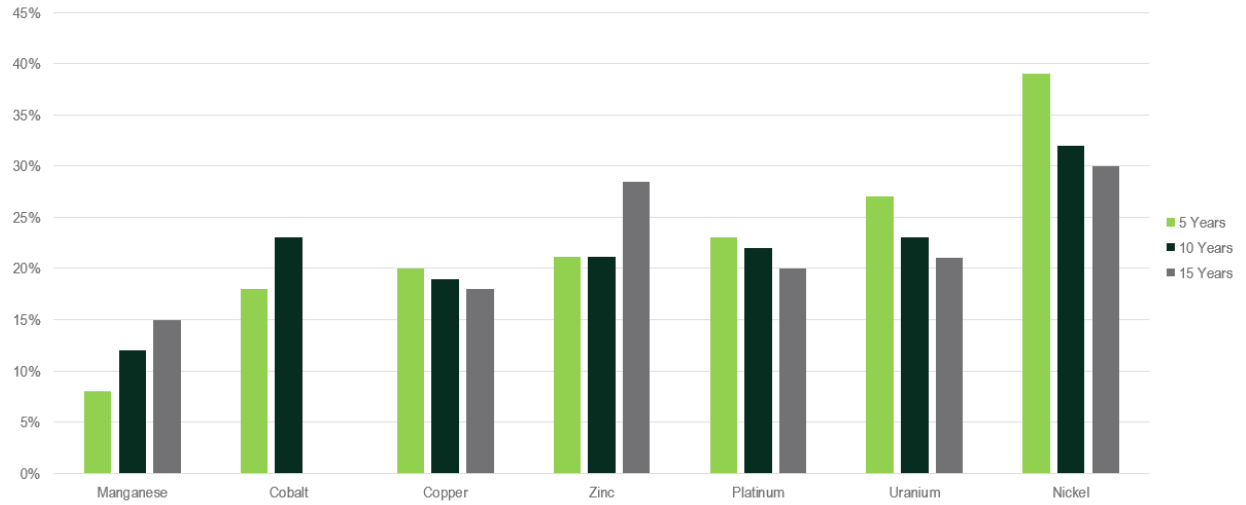
Source: EquityRT, KPMG analysis

The above graph offers insight into the appreciation/depreciation of the other minerals and fossil fuels category comprising Gold, Silver, Crude Oil, Natural Gas, and Coal, over 5, 10, and 15-year timeframes.

- The precious metals showcase relatively consistent high price appreciation over the various periods, while the energy minerals have a more sporadic growth pattern.
- The differences in the performances of these commodities underscore the diverse nature of commodities performance over time, and demonstrate the necessity of a nuanced approach when predicting future behaviours.
- The effects of various external factors, including global demand, geopolitical events, supply, potential substitute minerals, environmental circumstances, and economic price fluctuations, should be considered when analysing these value growths.

4.2.2.1 Volatility

Figure 13: Historic volatility of critical and low carbon minerals

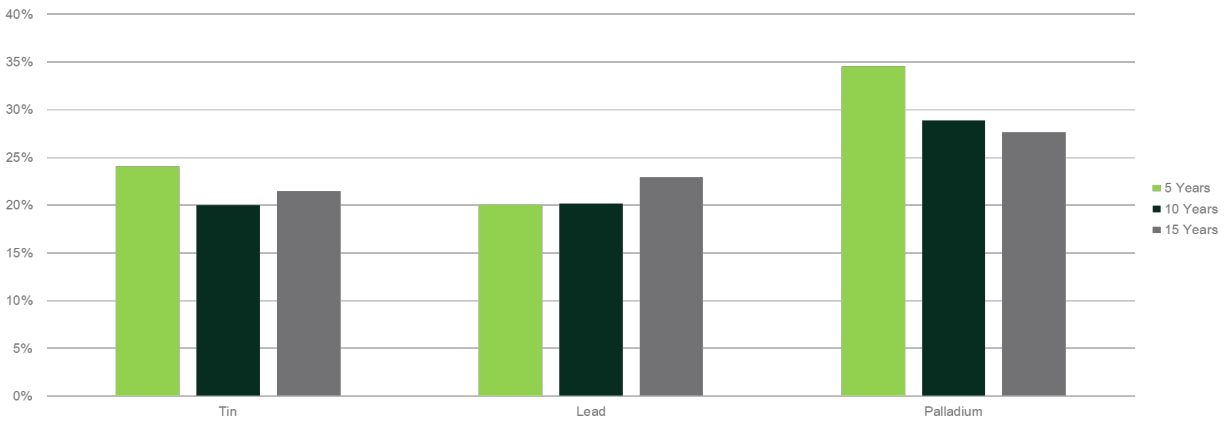


Source: EquityRT, KPMG analysis

The graph highlights the annual realised volatility of various critical and low carbon minerals, namely Manganese, Platinum, Copper, Uranium, Nickel, Zinc, and Cobalt, over 5-, 10- and 15-year time frames.

- The critical and low carbon minerals' volatility remains relatively constant over the three different time horizons. The minerals generally indicate a lower volatility over a longer time horizon, barring Manganese, Cobalt, and Zinc.

Figure 14: Historic volatility of industrial metals

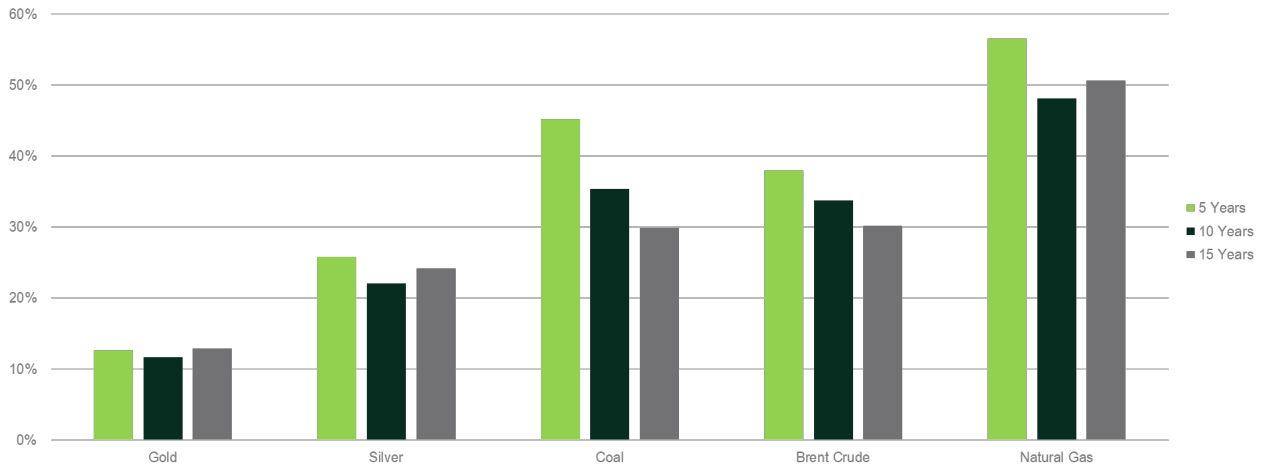


Source: EquityRT, KPMG analysis

The data presents the annual realised volatility over 5, 10, and 15 years for industrial metals including Tin, Lead, and Palladium.

- The industrial metals show a similar pattern in their volatility to that of the critical and low carbon minerals with a relatively constant volatility over three different time horizons.

Figure 15: Historic volatility of other metals and fossil fuels



Source: EquityRT, KPMG analysis

The graph outlines the annual realised volatility for Gold, Silver, Coal, Crude Oil, and Natural Gas, over 5-, 10- and 15-year timeframes.

- Gold displays the lowest volatility amongst the presented commodities. The energy commodities, however, indicate relatively high volatilities over all three time horizons, compared to all of the other commodities.

4.3 Forward-looking analysis

The underlying rationale for selecting the commodities that will make up the basket is based on the future expectation of the value of those commodities. For this reason, critical minerals appear to be a subsection of commodities that are expected to hold or increase their value into the future. This expectation is based on the demand for their uses as integral to the many technologies required for the implementation of the global green energy transition.

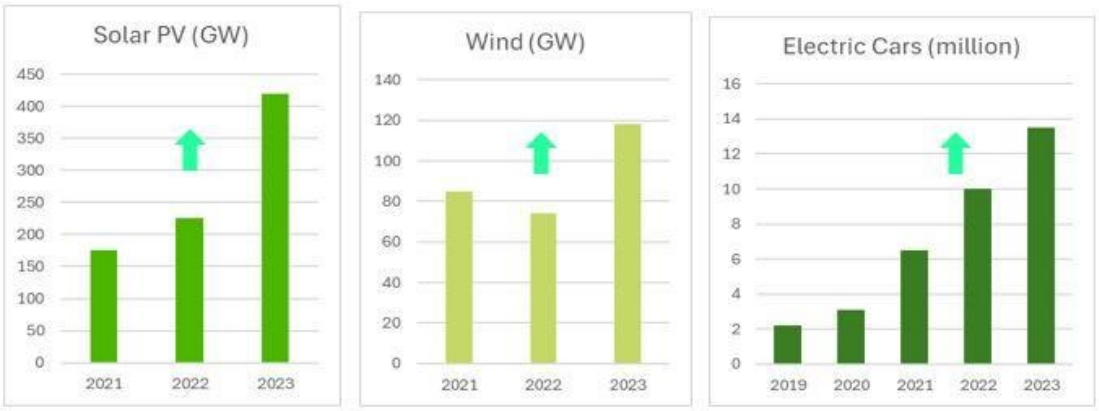
A recent study by the International Energy Agency[23] (IEA) highlights that the market for critical minerals and especially battery minerals (Cobalt, Nickel, and Lithium) has been turbulent over the past few years, with strong increases in prices experienced in 2021 and 2022, reversing into large declines in late 2023 and 2024.

Recent price declines can be explained by strong increases in supply[24] and ample inventories of certain critical minerals as well as the general slow economic growth globally in the post-pandemic period. This has been good for climate change technology roll-out, but has also meant that financing for more exploration for these minerals has also declined. This has created some uncertainty regarding the future movement of the prices of these commodities.

[23] International Energy Agency. *Global Critical Mineral Outlook 2024.*

[24] The increase in supply from Africa is projected to result in a 65% increase in the market value of its critical mineral sales by 2030.

Figure 16: Other minerals and fossil fuels



Source: IEA. Global Critical Mineral Outlook 2024. KPMG analysis

Underlying this volatility is the intention of most countries to move away from the use of fossil fuels as a source of energy, and towards sustainable energy sources as part of a larger awareness of the negative climate effects of fossil fuels. Most countries have set targets for achieving reductions in fossil fuel use and some have even mapped a path towards net-zero emissions at a future date.

What is clear is that demand for critical minerals remains robust, with solar and wind growing by an average of 75% in 2023, driven by the demand for network expansion and, by implication, for minerals such as Copper and Aluminium. Lithium saw a 30 percent increase in demand through 2023, while Nickel, Cobalt, and Graphite, experienced growth rates of between 8 and 15 %over the same period.

Going forward, the balance between the supply and demand for critical minerals presents a mixed picture with significant gaps between prospective supply and market demand for Copper and Lithium developing over time.

- The IEA[25] estimates that, if all projects currently announced to increase supply were to go ahead, they would only supply around 70% of Copper and 50% of Lithium demand.
- For Nickel and Cobalt, the relationship between projected supply and demand appears tighter, if confirmed project supply is considered.
- Finally, for Graphite and Rare Earths, there may not actually be a future supply constraint, however, the concentration of these minerals with over 90%of Graphite and 77% of Rare Earths originating in China, means that there is concentration risk that may result in severe supply constraints in future, depending on the geopolitical climate.

The IEA[26] further estimates that mining activity will need substantial investment to be able to access the mineral resources required to achieve either the currently announced country pledges, or to reach the net zero scenario. To achieve this, the IEA has estimated that mining investment of $590 billion will be required under the former target and up to $800 billion to achieve the latter. Other constraints on supply include a general need for improved logistics infrastructure, especially in Africa, to enable the prospective extraction industry to get those minerals to market.

The conclusion is that there is a good probability that given the dynamics listed above, over the period to 2040 and even 2050, the value of the critical minerals underpinning the mechanism would be expected to increase.

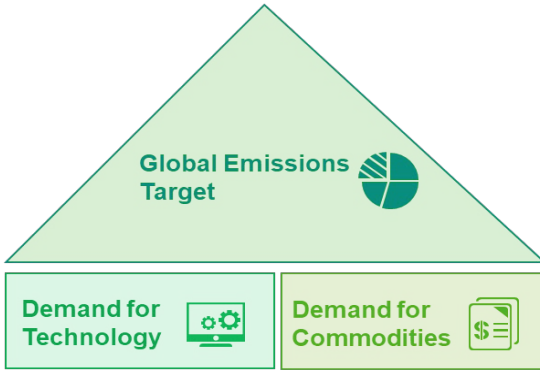
[25] International Energy Agency. *Global Critical Mineral Outlook 2024*. p8.

[26] International Energy Agency. *Global Critical Mineral Outlook 2024*. p9.

4.3.1 Scenario analysis of commodity markets

We included a scenario analysis of the commodity market and in particular the supply and demand dynamics for a select list of critical minerals to analyse the potential future trend of commodity performance.

Figure 17: Global emissions scenarios



The demand for critical minerals is both a derived demand for the technology used in the green-energy transition, which is dependent on the goals set by countries reflecting their ambitions with respect to climate change. The stronger the ambitions in terms of reductions in the use of fossil fuels, the greater the demand will be for green technology and therefore for critical minerals used in those technologies. The future scenarios are premised on analysis done by the International Energy Agency (EIA), which considers three future scenarios with respect to climate change ambitions.

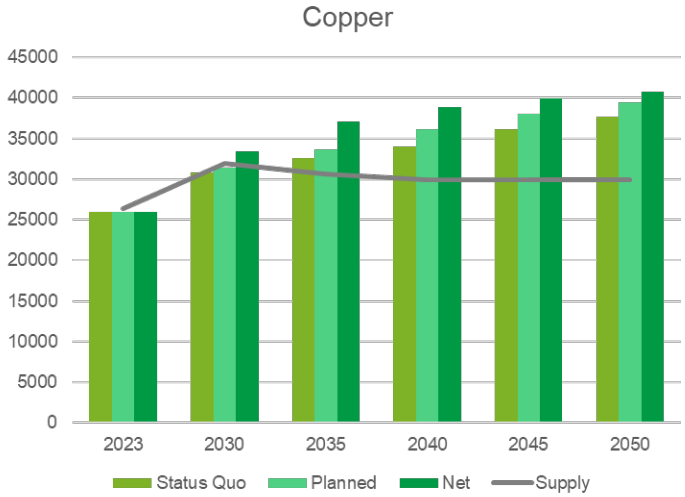
1) **Status quo** – In this scenario, emissions levels remain relatively stable and may even increase, as there is a lack of a binding commitment or effective regulation driving more substantial change.
2) **Planned projects** – Under this scenario, national policies aimed at decreasing Greenhouse emissions through various means such as transitioning to renewable energy, improving energy efficiency and regulatory measures.
3) **2050 Net Zero** – Any emissions produced are counterbalanced by efforts to remove an equivalent amount from the atmosphere, often through carbon capture technology and reforestation efforts.

4.3.2 Copper

Copper is used in a variety of green technologies, from solar panels and electric vehicles to wind turbines, and generally for the expansion of energy grids based on the growth of sustainable energy sources.

Demand for Copper is expected to grow substantially over the period to 2050, especially under the net zero emission scenario. At the same time, ESG projects are predicted to grow from 25%of current demand to around 47% of demand, thereby becoming a more important determinant of future Copper prices. The analysis of supply and demand factors for Copper appears to suggest an increasing future price trend.

Figure 18: Supply and demand for Copper

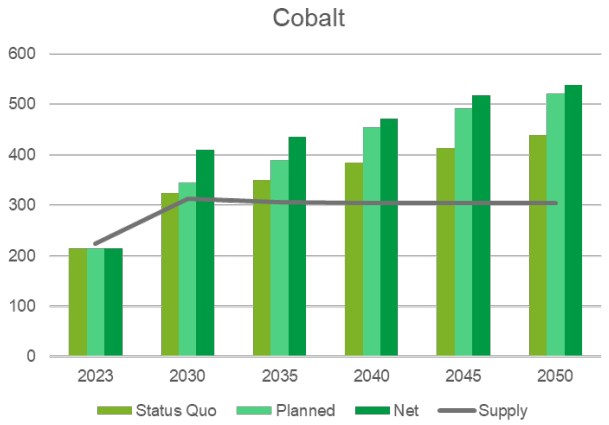


Source: International Energy Agency. Global Critical Mineral Outlook 2024. KPMG Analysis

4.3.3 Cobalt

As an important element used in cathodes in battery technology, the use of more battery storage for electric vehicles and grid storage will drive the demand for Cobalt. Although demand is expected to grow, as can be seen in the graphic below under all three emission scenarios, production is relatively concentrated with the Democratic Republic of Congo accounting for almost 70% of global production. This concentration introduces concentration risk and has encouraged research into finding alternative substitute products. Green technologies are expected to grow from accounting for 30%of demand for Cobalt to approximately 60% in future, making the demand for green projects a more important determinant of the price of Cobalt.

Figure 19: Supply and demand for Cobalt



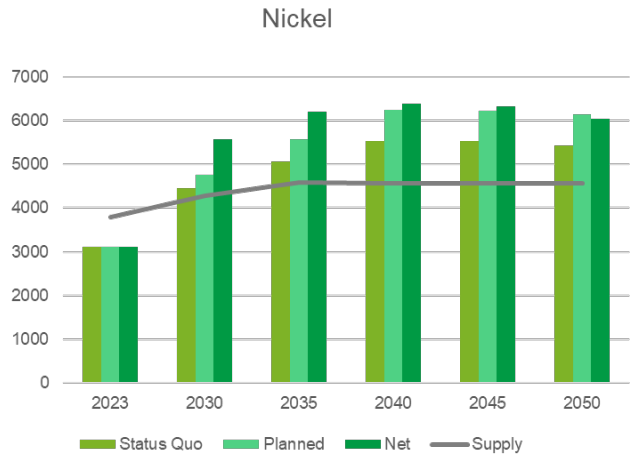
Source: International Energy Agency. Global Critical Mineral Outlook 2024. KPMG Analysis

Given the current supply and demand dynamics, the price for Cobalt is expected to trend upwards over the forecast period without a substitute element being found.

4.3.4 Nickel

Nickel is another mineral used for cathodes in battery technology. As the demand for battery storage and electric vehicles rise, so too will the demand for Nickel. Nickel is one of the few minerals that can serve as a substitute for Cobalt. Therefore, the demand for Nickel is also expected to increase over time. Currently, green energy applications account for approximately 15%of the demand for Nickel, but demand is expected to grow to around 51% over the forecast period as the green energy transition gathers momentum.

Figure 20: Supply and demand for Nickel



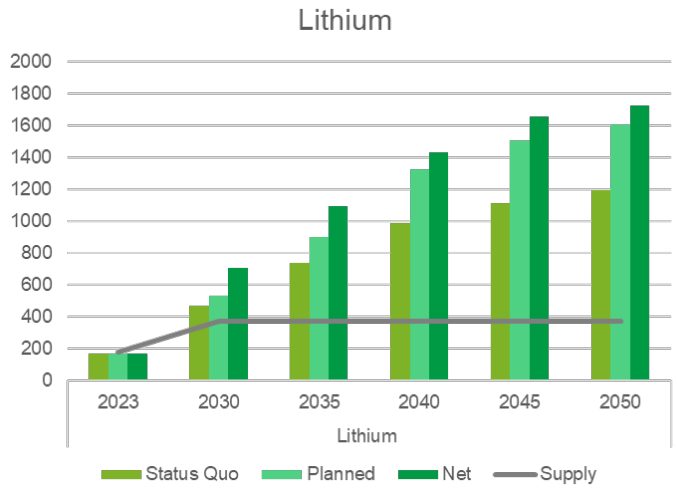
Source: International Energy Agency. Global Critical Mineral Outlook 2024. KPMG Analysis

Given the expected growth of demand for battery storage and the supply and demand dynamics presented, the trend for Nickel is expected to be upward sloping.

4.3.5 Lithium

Lithium is a third mineral used in battery storage and is therefore dependent on the demand for grid storage applications, and the growth of the electric vehicle sector. Other applications include the magnets used in wind turbines. As a result, the demand for alternative energy and batteries will drive the demand for Lithium in future. This may be countered by technology developments towards manufacturing batteries of a smaller size, and alternative, solid state battery technology. Currently, there are no substitutes for Lithium-Ion battery technologies. As a result, it is expected that the demand for Lithium will increase by 40 times under the net zero emission scenario.

Figure 21: Supply and demand for Lithium



Source: International Energy Agency. Global Critical Mineral Outlook 2024. KPMG Analysis

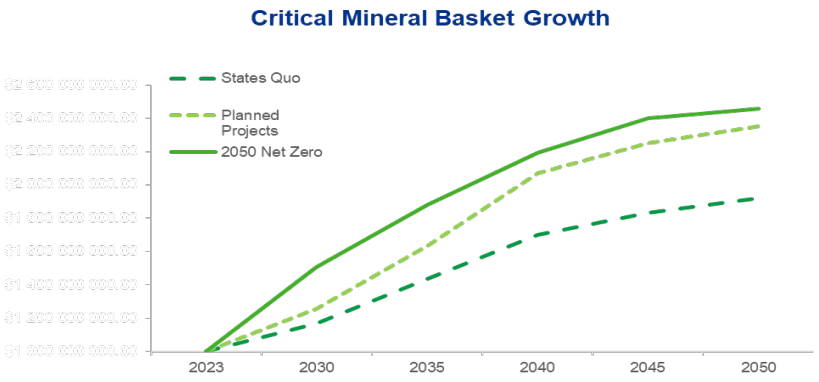
Given the potential future demand for battery storage applications and the levelling off in the supply of Lithium, our analysis finds that there will be an upward trend in the value of this mineral.

4.3.6 Critical mineral analysis and the future value of the commodity basket

The demand for critical minerals is expected to grow, as countries attempt to reduce their emissions of global Greenhouse gasses. In addition, the future growth in demand for many minerals is expected to exceed the supply of those minerals, putting upward pressure on the value of the critical minerals over the following decades, under all three of the EIA's emission scenarios.

As a result, the value of the commodity basket is expected to increase over time, although quantifying that future value is subject to much uncertainty and will require further scenario analysis before a reasonable range can be provided.

Figure 22: Expected trend of the value of the commodity basket



Source: International Energy Agency. Global Critical Mineral Outlook 2024. KPMG Analysis

4.4 Currencies analysis

The value and stability of currencies provides an indication of a country's economic strength. This section presents a quantitative analysis of a selection of African and other currencies. Currency performance forms a critical part of determining the feasibility of a commodity basket formed to mitigate local currency risk.

4.4.1 Methodology applied to select currencies

Two groups of countries were selected for analysis:

- African countries that would potentially participate in the currency convertibility mechanism as participating countries.
- A group of countries representing hard currencies, that potentially would act as lender countries into the mechanism and against which the performance of the African country currencies could be measured.

The selection of the African country currencies for this analysis was guided by two main dimensions:

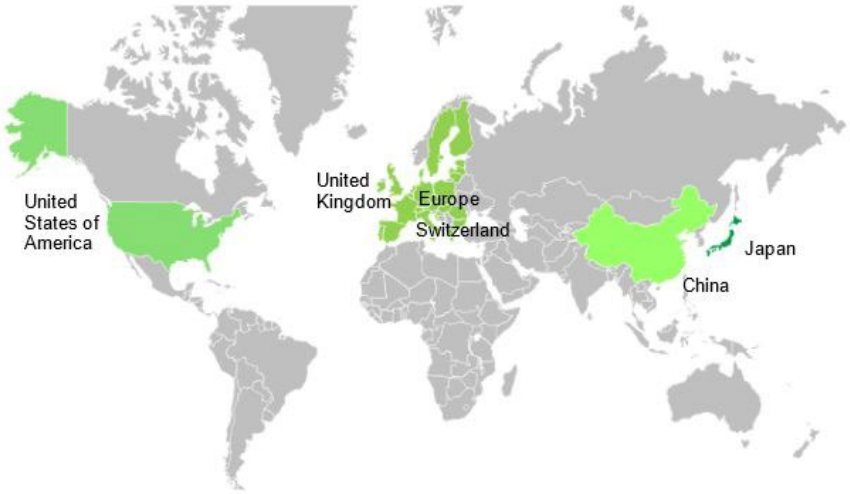
- The size of the individual economies as measured by GDP, with preference given to larger economies.
- The prominence of the resource extraction industry in those countries. In addition, data availability and data quality were also a consideration with longer, complete time series preferred to shorter, intermittent series.

Table 5: Currency groupings

Currency grouping	Component currencies
African currencies	Nigeria Naira, Ghanaian Cedi, Egyptian Pound, Ethiopian Birr, Congolese Franc, South African Rand, Botswana Pula, Guinean Franc, Kenyan Shilling, Moroccan Dirham.
Hard currencies	US Dollar, UK Pound Sterling, Euro, Japanese Yen, Chinese Yuan, Swiss Franc.

Figure 23: Map of African currency countries

Figure 24: Map of Hard currency countries



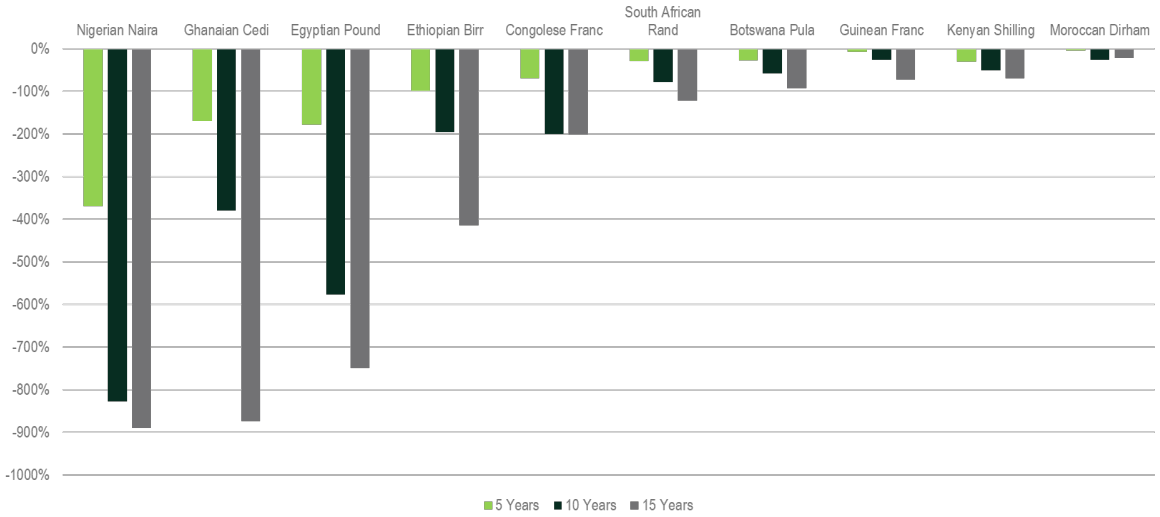
4.4.2 Quantitative analysis

The quantitative analysis serves as the backbone of our methodological approach. The aim is to understand the behaviour of the different currencies to gauge the potential scope and influence of the proposed currency convertibility mechanism.

4.4.2.1 Currency Appreciation/Depreciation

Exchange rate data of daily frequency was collected for the countries listed above for the time period 2009 to 2024.

Figure 25: African country currencies depreciation over the period 2009 to 2024



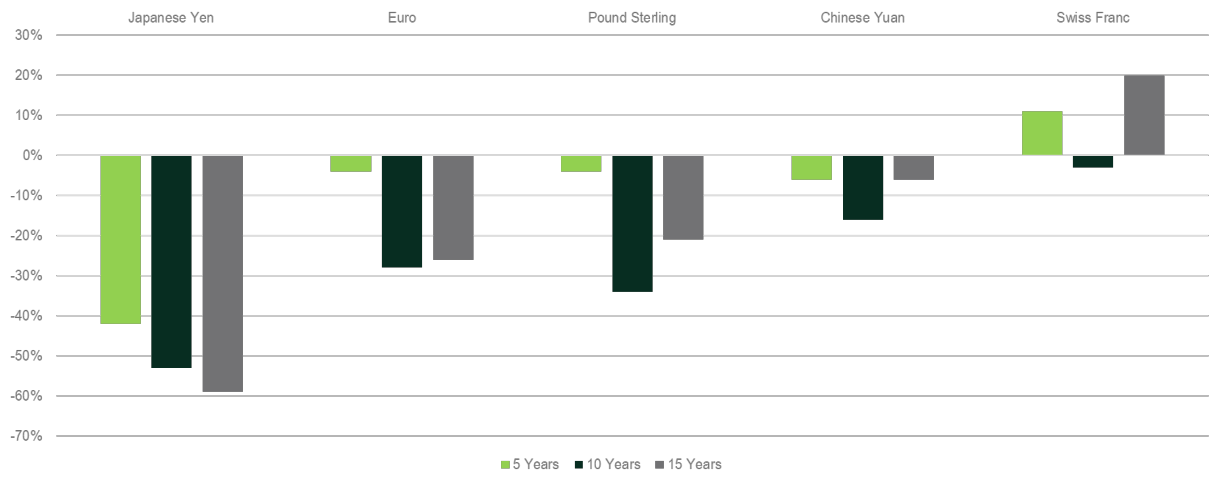
Source: EquityRT, KPMG analysis

The analysis shows the historical depreciation for a set of African currencies over three distinct time intervals of 5 years, 10 years, and 15 years.

- Six of the ten African currencies lost more than half of their value over the 15-year period. The remaining four countries also lost value against the US Dollar, but to a lesser extent. Nigeria, Ghana, and Egypt experienced the largest value loss.

- All African country currencies analysed experienced a depreciating trend against the US Dollar over the period under review, with the rate of depreciation varying substantially across those countries.

Figure 26: Major country/regional currencies appreciation/depreciation over the period 2009 to 2024

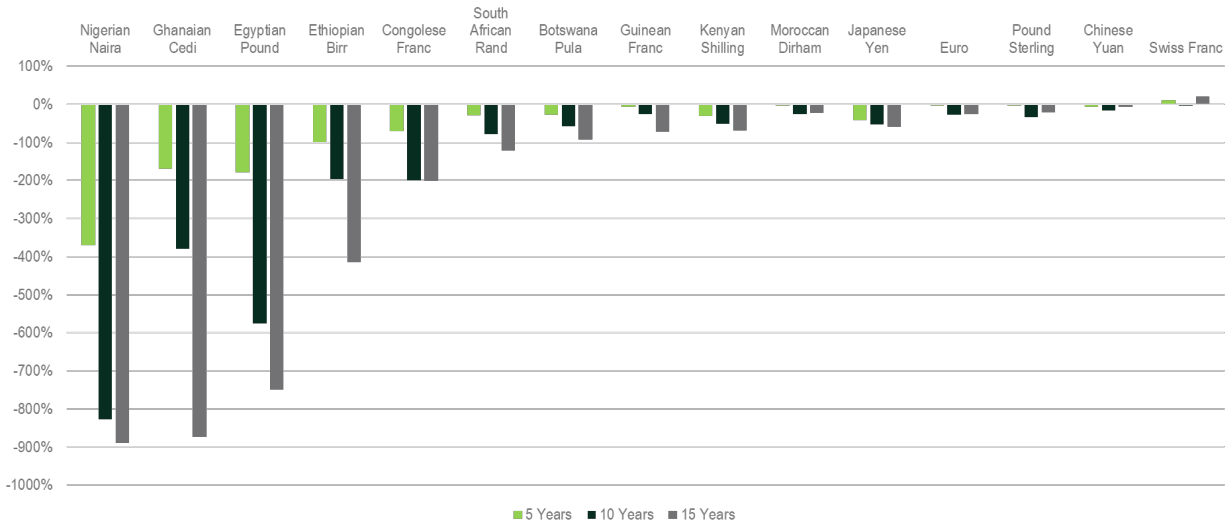


Source: EquityRT, KPMG analysis

The graph above indicates the appreciation/depreciation of five hard currencies to the US Dollar over 5, 10, and 15 years. These include the Japanese Yen, Euro, Pound Sterling, Chinese Yuan, and Swiss Franc.

- The hard currencies also generally depreciated against the US Dollar over the three time horizons. When compared to the African currencies, however, the extent of the depreciation is far lower.
- The Swiss Franc was the only currency included in the analysis that increased in value against the US Dollar over the 15 and 5-year periods.

Figure 27: Comparison of the extent of appreciation/depreciation of African country currencies to hard currencies



Source: EquityRT, KPMG analysis

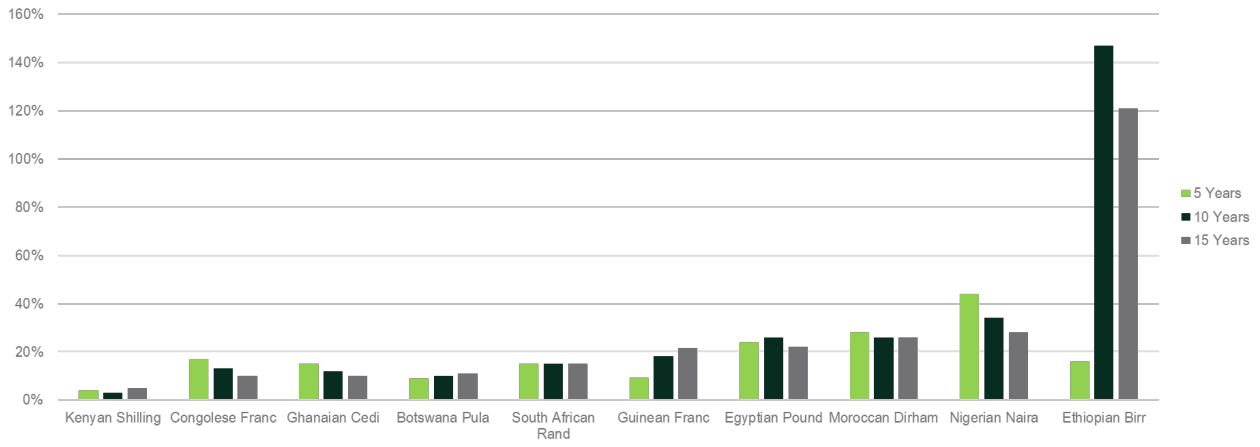
The African currencies experience significantly larger depreciation to the US Dollar, when compared to the hard currencies over the three periods analysed. The Naira and Cedi depreciated by more than 800%. In contrast, the hard currencies depreciated by less than 50% over the same period.

The analysis above highlights the problem many African economies have when attempting to service Hard currency loans using depreciating local currency payments. The value of the repayments in local currencies depreciates faster compared to the hard currencies of the lenders, therefore increasing the repayment burden, and reducing the ability of the borrower to service that loan.

4.4.2.2 Volatility

The currency volatility assessment serves as an essential measure for identifying investment risks over time due to the uncertainty associated with the value of that currency at any future period. Currencies with lower volatility offer more stability over time, while more volatile currencies present considerably more risk. Understanding currency volatility would be important to determine the currency risk that could be managed through a value-retaining basket of commodities.

Figure 28: African country currency volatility



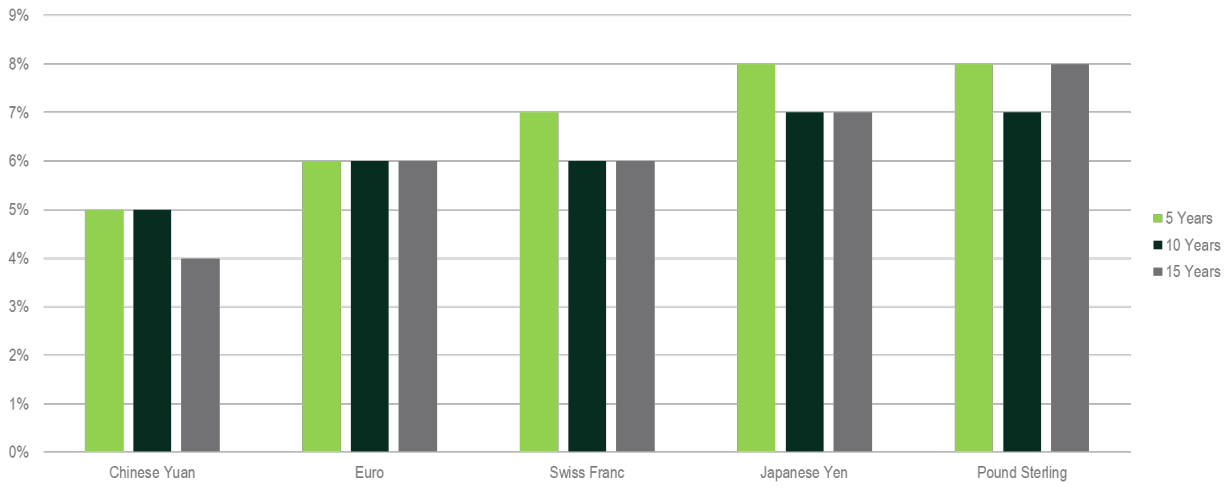
Source: EquityRT, KPMG analysis

Analysing the volatility of the African currencies over the periods of 5, 10, and 15 years, indicates a range of outcomes.

The volatility of African currencies tends to be stable over the three-time horizons, with the exception of the Ethiopian Birr.

- The measured volatility for the African currencies of around 20% indicates a relatively higher level than the 8% for the hard currencies over the three time horizons.

Figure 29: Hard currency volatility

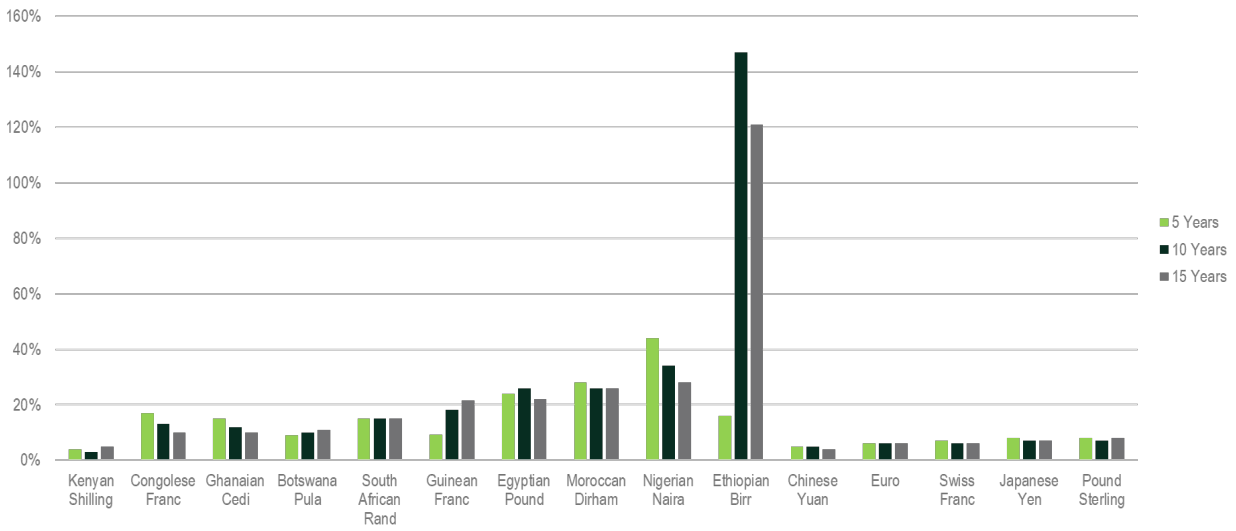


Source: EquityRT, KPMG analysis

The graph above presents the volatilities of the hard currencies over the periods of 5, 10, and 15 years.

- The hard currencies have stable volatilities of around 8%.

Figure 30: Comparison of African to Hard currency volatility



Source: EquityRT, KPMG analysis

The hard currencies display a considerably lower level of volatility, when compared to African currencies.

4.4.2.3 Summary

African currencies experience a larger rate of depreciation over time, along with higher volatility than the hard currencies. The Nigerian Naira experiences the highest rate of depreciation, whereas the Moroccan Dirham experienced the least. In terms of volatility, the Ethiopian Birr experienced significant fluctuation, while the Kenyan Shilling proved to be the least volatile.

The hard currencies generally experience a lower rate of depreciation and lower volatility than the African currencies over the three periods.

4.5 Commodity basket construction

The development of a diversified collection of commodities or commodity basket that retains, or even gains, value over time and has low volatility can play a pivotal role in providing a store of value that can be used to facilitate development financing.

Three distinct commodity baskets were constructed to assess different levels of diversification that can be achieved from combining alternate combinations of commodities. The three baskets are defined as follows:

Table 6: Commodity baskets

Basket #	Description of Commodity Basket
1	Critical minerals and low carbon minerals.
2	Critical minerals, low carbon minerals, and Industrial metals.
3	All commodities.

Each basket contains the same proportion of the component commodities at inception, ensuring balanced exposure and minimising the risk associated with any single commodity. The portfolio inception date was the 1st of January 2013.

4.5.1 Methodology applied to determine the basket composition

The selection of the above three portfolios reflects strategic choices, based on the essential role these commodities play in renewable and low carbon energy production and storage, along with the search for the most diversified and stable combination of commodities.

The data used for this analysis includes daily price data for all commodities considered, from 2013 to 2024.

4.5.2 Analysis of commodity baskets

4.5.2.1 Components of commodity baskets

The critical mineral and low carbon basket consists of the following commodities:

Figure 31: Basket options

Critical minerals + low carbon basket	
Platinum	Nickel
Copper	Uranium
Cobalt	Zinc
Manganese	

Critical minerals are essential for several high-tech industries and the transition to renewable energy sources. These minerals are crucial for manufacturing batteries, electronics, and green technologies such as electric vehicles and renewable energy infrastructure. The increasing demand for these applications makes critical minerals a strategic choice for a growth-oriented basket.

The critical mineral and low carbon and industrial metals basket includes all the critical and low carbon minerals plus:

Critical mineral + low carbon and industrial metals basket
Tin
Lead
Palladium

By adding industrial minerals like tin, lead and palladium, this portfolio aims to diversify further while still focusing on materials essential for green-energy transition, industrial and technological applications.

This basket includes all the critical and low carbon mineral plus industrial metals plus:

All commodities	
Gold	Natural gas
Silver	Coal
Crude oil	

This diversified portfolio encompasses a broad range of commodities, including precious metals, fossil fuels, critical minerals, and industrial metals. Gold and silver are traditional safe-haven investments and store of value. Crude oil, natural gas, and coal are fundamental traditional energy sources, critical for global energy markets and economic activity.

Basket	Value growth %	Volatility %
Critical and low carbon mineral	10.5	2.5
Critical and low carbon + industrial minerals	10.9	2.7
All commodities	10.3	3.3

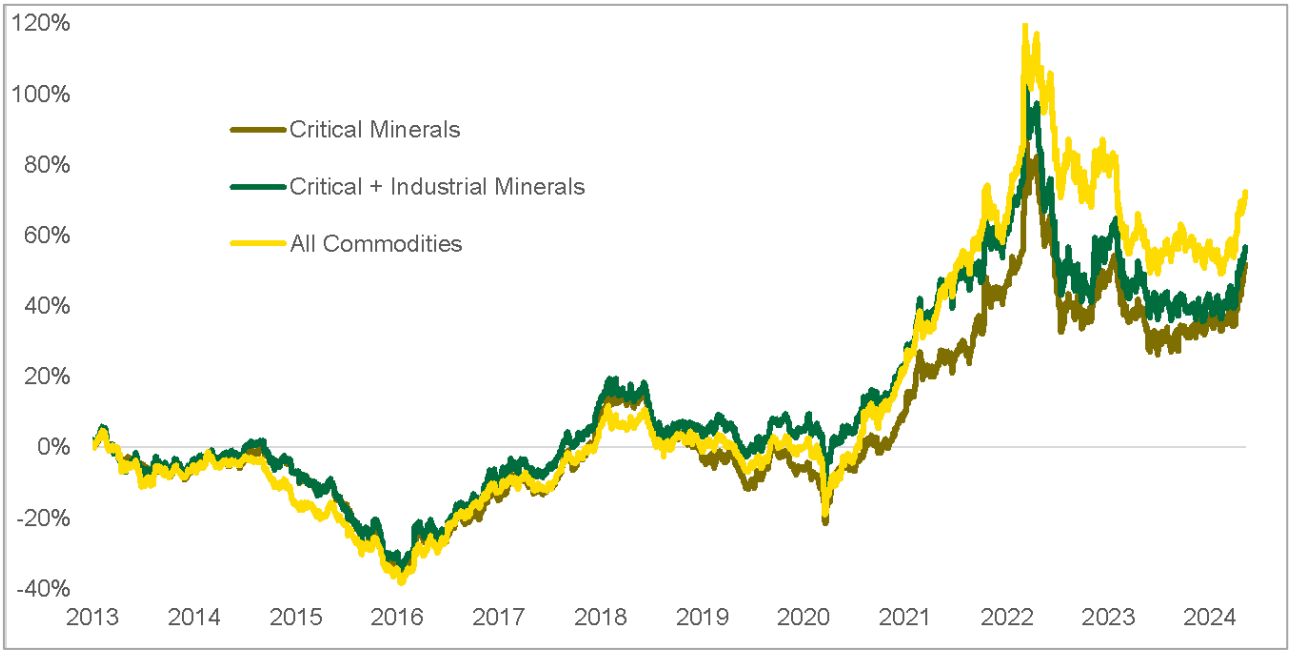
The critical and low carbon minerals basket focuses on stability and steady growth, with a relatively low volatility of 2.5% and an average growth in value of 10.5% per year. The low volatility indicates that the portfolio is less susceptible to market fluctuations.

Adding industrial minerals to the basket leads to a marginal increase in both volatility and value growth, compared to the critical mineral's portfolio. The volatility of 2.7% is still relatively low, indicating a stable investment. The average growth in value of 10.9% per year suggests that the inclusion of industrial minerals and palladium enhances growth potential without significantly increasing risk.

The addition of a broader range of commodities increases the basket's volatility further to 3.3%, reflecting greater exposure to market dynamics and fluctuations in commodity prices. The average growth in value decreases marginally to 10.3% per year. This indicates that, while the portfolio contains more components and is more diversified, the inclusion of precious and energy commodities does not add any additional portfolio benefits in terms of growth in value or reducing the volatility.

4.5.2.2 Commodity portfolios

Figure 32: Realised change in value of all three commodity baskets



Source: EquityRT, KPMG analysis

- All three baskets experienced significant volatility, particularly around the years 2015-2016 and 2020-2021.
- The critical and low carbon minerals, including industrial metals baskets, move in tandem, with the All commodities basket showing similar but more pronounced movements.

The increase in volatility and subsequent lower performance around 2020-2021 reflects the COVID-19 pandemic period, where commodities experienced significant price fluctuations based on changing global growth prospects.

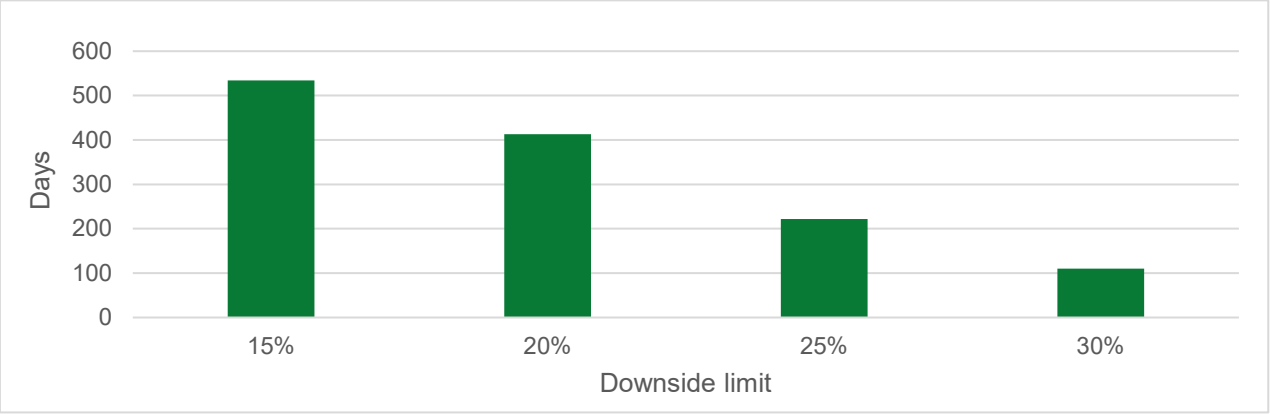
4.5.2.3 Downside analysis

The downside analysis aims to assess the absolute percentage loss of value of the basket, as well as the number of days that the basket remains below its initial or face value. The percentage loss limits were set in a range between

15% as the lowest limit and 30% as the upper limit, in anticipation of a potential haircut value set within the same range.

The analysis was performed using the three commodity baskets defined above, using data covering a ten-year period, from 2013 to 2024.

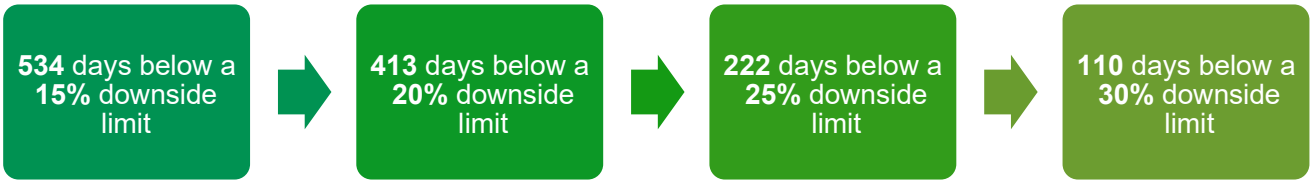
Figure 33: Bar chart of days below specified downside limit



Source: EquityRT, KPMG analysis

The figure above indicates that the basket had a period of around 530 days during which its value was 15% below its face or initial value. It also indicates that the same basket had a period of 110 days during which its value was 30% below its face or initial value.

The implication of the analysis is critical to estimate the potential duration of loans that could be set under the currency convertibility mechanism, and to set limits as well as haircut percentages[27] into the commodity management framework agreement.



With a 20% haircut, and assuming that the portfolio will not experience downside below 30% for more than four months, the maximum loss that could be experienced by counterparties will be the difference between the maximum downside loss of the portfolio and the haircut, in this case a maximum loss of 10%.

4.6 Commodity basket performance analysis

4.6.1 Analysis of results

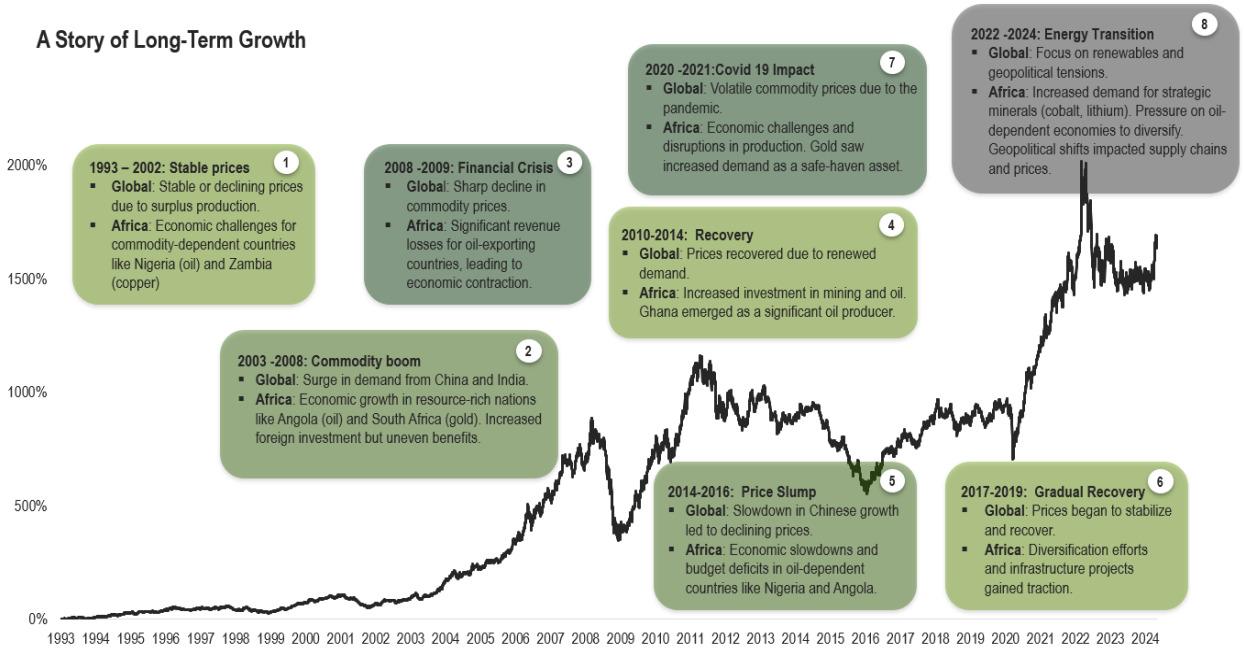
4.6.1.1 Long term growth of commodities

The history of commodity prices over the past few decades tells a compelling story of economic ebbs and flows shaped by global events, a global pandemic, and regional supply and demand dynamics. This period has seen significant shifts, from stable prices to dramatic booms and slumps, each leaving a lasting effect on economies worldwide, particularly in Africa.

The trajectory of these commodity prices reflects the changing demand and production capacities and underscores the intricate linkages between global market trends and the economic health of commodity-dependent nations. This overview outlines the key phases of commodity price movements from 1993 to 2024, illustrating how global developments and regional responses have intertwined to shape the economic landscape.

[27] The reduction in the stated value of an asset

Figure 34: Commodity basket long-term growth



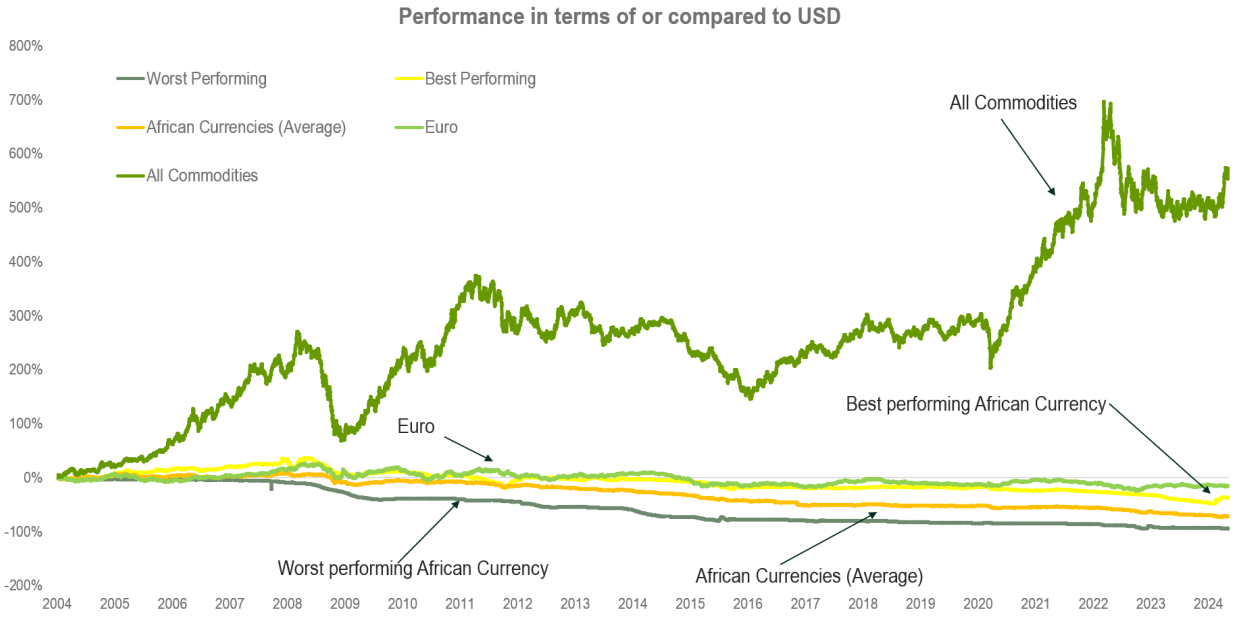
Source: EquityRT, KPMG analysis

- From pre-2003, commodity prices were either stable or declining, challenging African economies dependent on exports like Nigeria and Zambia.
- The 2003-2008 commodity price boom, driven by China's industrial growth, boosted prices and benefited resource-rich African nations.
- The 2008-2009 global financial crisis caused a sharp decline in commodity prices, significantly affecting commodity exporting economies. A recovery period (2010-2014) saw rising commodity prices and increased investment in the extraction industry.
- A 2014-2016 price slump, due to China's economic slowdown, strained fiscal positions in oil-exporting African countries. From 2017-2019, gradual price recovery and economic diversification efforts began stabilising African economies.
- The COVID-19 pandemic (2020-2021) caused commodity price volatility and fiscal strain due to the unforeseen additional health and social expenditures along with a reduction in tax revenues due to economic lockdowns in many sectors of the economy.

The 2022-2024 focus is on the growth and roll-out of renewable energy, driven by climate change, the desire for energy independence and geopolitical shifts like Russia's invasion of the Ukraine. This has led to increased demand for critical and low carbon minerals like Copper, Cobalt, Manganese, Bauxite, Uranium, and Lithium, etc.

4.6.2 Currency versus commodity basket performance

Figure 35: Performance of commodity basket vs currencies



Source: EquityRT, KPMG analysis

The commodity basket significantly outperformed both African and hard currencies over the period 2004 to 2024, peaking at around 700% above the baseline before stabilising at 500%-600% despite noticeable volatility with peaks in 2008, 2011, and 2022 and troughs in 2009, 2016 and 2020.

The Euro showed relative stability but limited growth, fluctuating close to the baseline with minor deviations and a 14% overall loss in value against the dollar over the period.

African currencies experienced substantial losses against both the commodity basket and the US Dollar, with the worst performing at -94%, the average at -71%, and the best at -35% over the period.

4.7 Conclusion

The assumption that a basket of commodities comprising critical minerals found on the African continent could hold value better than any African currency was confirmed, based on the analysis conducted using historical commodity and currency data contained in this section.

The historical analysis showed a better-than-expected result, with a commodity basket composed of critical minerals showing growth of more than 600% between 2004 and 2024, while a basket of African currencies experienced a depreciation of more than 50% over the same period.

The downside analysis, which is critical in setting haircut ratios and understanding the operational duration of the proposed mechanism, was performed on a set of commodity baskets over a period of ten years. The finding was that, with a 20% haircut, and assuming that the portfolio does not experience downside movements below 30% for more than just a couple of months, the maximum loss that could be experienced by counterparties will be the difference between the maximum downside loss of the portfolio and the haircut, which in this case is 10%.

05

Currency convertibility and liquidity risk

5. Currency convertibility and liquidity risk

5.1 Introduction

Currency convertibility is the ability to exchange one currency for another at a given rate of conversion, to be able to use that currency for foreign transactions. A convertible currency is considered a highly liquid instrument, especially when compared to currencies that are tightly controlled by central banks or other government entities. A convertible currency is generally known as a Hard currency.

The convertibility and liquidity risk in this context is an assessment of the risk quantum related to exchanging a local African currency for a Hard currency, within a project financing structure.

The structure of the proposed currency convertibility mechanism aims to narrow the funding gap facing African countries to fund clean energy investment. It is based on the following premises:

- Requirement for long-term sustainable finance that mitigates currency risk.
- The need to pool and leverage Africa's natural resource endowments in ways that encourage international capital providers to invest in projects that earn local currency without the need for government guarantees.
- Africa's rich endowment in critical low carbon minerals that are to be monetised.

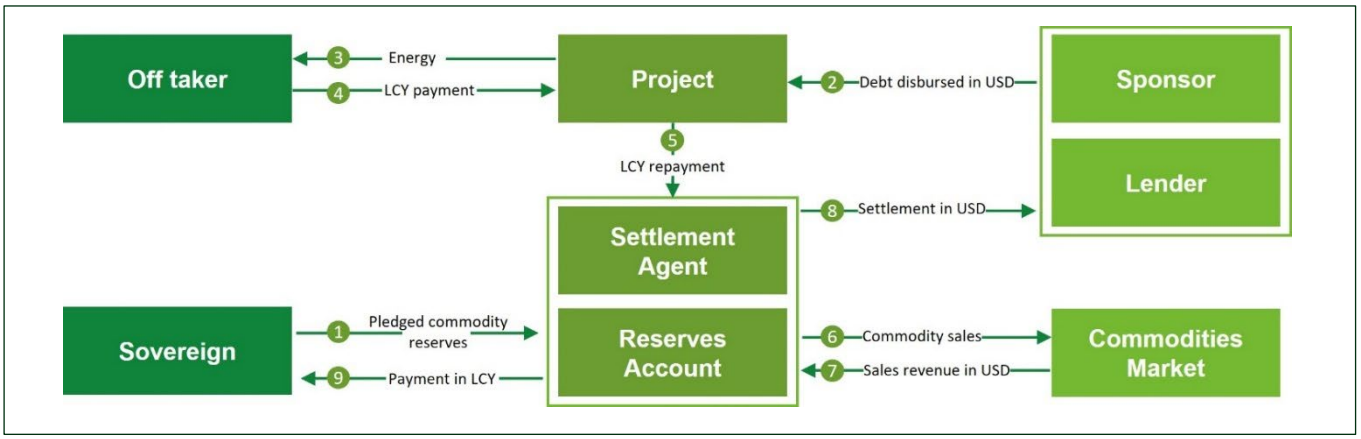
5.2 Structure of currency convertibility mechanism with commodity basket

5.2.1 Commodity pledge

Starting with a traditional project finance structure and introducing a settlements agent, to manage the flow of funds, as well as a commodity basket to underpin the availability of Hard currency, will enable the mitigation of currency and convertibility risk in large infrastructure projects throughout Africa.

The reduction of the currency-convertibility risk through this mechanism would incentivise investors to be open towards providing better loan terms (e.g. a lower interest cost), while increasing the number of such loans.

Figure 36: Settlement agent process



Key to figure 36 above:

1. Sovereign pledges to trade a pre-agreed percentage of commodity reserves through the Settlements Agent.
2. AUA denominated debt disbursed in USD.
3. Project Company sells electricity to the off taker.
4. Off taker pays for electricity in LCY.
5. The project pays LCY to the Settlement Agent.
6. Settlement Agent sells commodities through Commodities Market.
7. Sales revenue from commodities market settled in USD.
8. Settlement Agent settles the lender in USD.
9. Settlement Agents pays the sovereign in LCY.

Within this proposed currency convertibility mechanism, the borrower country consents to join the settlements arrangement and pledges a portion of its verified, tradeable commodity reserves[28]. The accumulated borrowings of each country in African Units of Account (AUA) will be limited by the value of the commodities pledged (at a ratio to be determined).

The borrower, represented by a specific project within the participating country, and the lender mutually agree to the terms of a loan that is denominated in the African Units of Account (AUA). This agreement includes the usual terms of any loan such as amount, interest rate, repayment schedule, and other relevant conditions.

- Both the borrower and the lender consent to using a settlements agent to facilitate the transaction. The settlements agent acts as an intermediary to manage the flow of funds.
- The lender disburses the principal amount of the loan in a stable, internationally recognised Hard currency (such as USD, EUR, or GBP) directly to the borrower. This transfer ensures that the borrower receives a reliable and widely accepted currency to fund their project and undertakes the currency conversion (to local currency) in-country if necessary.
- The role of the settlements agent is to receive payments in local currency from borrowers and pay the AUA-equivalent in Hard currency to lenders. The payments in local currency will be transferred over time by the settlements agent to the participating countries as compensation for the commodities pledged. The settlements agent will obtain Hard currency, necessary to pay the lenders, through a combination of commodity sales, loans, and other financial instruments leveraging the basket of commodities.

The mechanism starts with the borrower's government pledging to trade a pre-agreed portion of commodities mined within their respective jurisdictions through the settlements agent. The commodities pledged will be part of a diversified basket of commodities.

- Upon receipt from borrowers of the debt repayment in local currency, the settlements agent will raise liquidity using the basket of commodities for the settlement of the AUA-denominated loan repayment obligations with lenders. The loan will be settled in Hard currency, as the AUA will be a non-circulating currency.
- In the event of the basket of pledged commodities deteriorating in value, dropping below parity to the value of the Hard currency, there will be mechanisms in place, including a haircut[29], to cover a potential deterioration of the value of pledged commodities, including buffers and financial instruments. It is envisaged that these mechanisms will cover the potential devaluation under most scenarios. If these mechanisms are not sufficient, governments would be prompted to pledge additional commodities to support the value of the AUA.
- It is important to note that this greatly reduces the likelihood of a settlement agent's default when contrasted with a government guarantee, because even in the event of Hard currency unavailability in the participating African country, the diversified commodity market remains comparatively liquid and holds value against international Hard currencies.
- The settlements agent will transfer, over time, all local currency it receives from the borrower to the relevant participating country as payment for the commodities traded. This transfers the currency risk to the pledging government in the long-term.

The participating countries pledge to trade a specified percentage of their verified tradeable commodity reserves, which may consist of one or more commodities. This pledge serves as a convertibility mechanism for the Hard currency required to meet the debt service for the project.

- The value of the commodity basket is based on the market value of the commodities at the pledge start date. This gives flexibility to introduce buffers and other mechanisms to protect the value of the AUA and establishes a reference rate for the AUA, which remains constant throughout the duration of the loan.

Over time, it may become necessary or advantageous for the participating countries to make additional pledges of commodities to the settlements agent. The supplementary pledges can increase the underlying headroom of the participating country for future financing opportunities in AUA.

[28] The verified tradeable reserves will need to be approved by a Competent Person as required by JORC Code or AMREC PARC

[29] Haircut explained in section 5.2.2.

A mining house, such as Anglo American, could be included in the overall structure as a third party to provide a guarantee of the delivery of commodities upon sale. This external entity would provide an additional layer of assurance that the liquidity from the pledged commodities will be raised as expected.

In a traditional project finance setting, a project company, or Special Purpose Vehicle (SPV) is established with the sole purpose of isolating project risks and holding the project assets. This separation ensures that the project's risks and assets are distinct from the sponsors' other assets. Lenders will mostly rely on the SPV's cash flow generation for loan repayment. Under the proposed mechanism, this relationship between the lenders and the SPV will not change.

This proposed mechanism is complementary to other financing structures currently used, and more importantly, it is not a loan structure itself but rather a settlements mechanism to facilitate lending into and across the continent.

Due to the ongoing and more rapid devaluation of the local currencies, (currency risk), and the scarcity of foreign currency reserves needed to repay debt (convertibility risk), loans are seldom available in Hard currency to deals within developing countries, especially within Africa. When these loans are obtainable, they are usually expensive and have short-term durations due to several factors, including financial risks and regulatory capital constraints.

The introduction of the settlements agent and commodity basket will assist in mitigating the currency and convertibility risks within the existing project finance architecture. Other project risks such as construction risk, operational risk, market risk etc. will be allocated between the parties based on negotiations, exactly as they are now under a traditional project finance structure. The only risk that the mechanism aims to mitigate is currency risk and, in so doing, will also positively affect the availability of financing.

5.2.2 Haircut

The risk of exposure to the commodity basket can be reduced further by introducing a haircut to the pledged securities. That is, the total headroom for AUA-denominated loans will be limited to a portion of the market value of the pledged commodities. This additional buffer allows for the basket to moderately deteriorate in value without breaking the AUA's peg to par.

The downside analysis performed on a set of commodity basket portfolios over a period of ten years (including downside commodity cycles) indicated a suitable haircut in a range between 20% and 30% could protect the AUA´s peg to Hard currencies. In other words, each participating country will be required to pledge commodity trades of 1.2 to 1.3 times the value of transactions that it wishes to facilitate via the settlements agent.

5.3 Conclusion

A commodity basket backed currency convertibility mechanism complements the traditional financing structures in place for traditional project finance. The proposed mechanism allows for the mitigation of currency exchange rate and convertibility risks, thus improving the bankability of transactions.

Multiple mechanisms including financial instruments and haircuts will be put in place to stabilise the value of the commodity basket, ensuring efficient currency conversion and liquidity.

06

Risk Mitigation Analysis

6. Risk mitigation analysis

6.1 Introduction

The risk factors that a settlements agent implementing the currency convertibility mechanism must take into consideration are defined and documented in this section. We also consider practical solutions implemented by other financial institutions, such as traditional settlement banks, like the BIS and Central Clearing Counterparties (CCPs) like the London Metals Exchange (LME), to mitigate these risks.

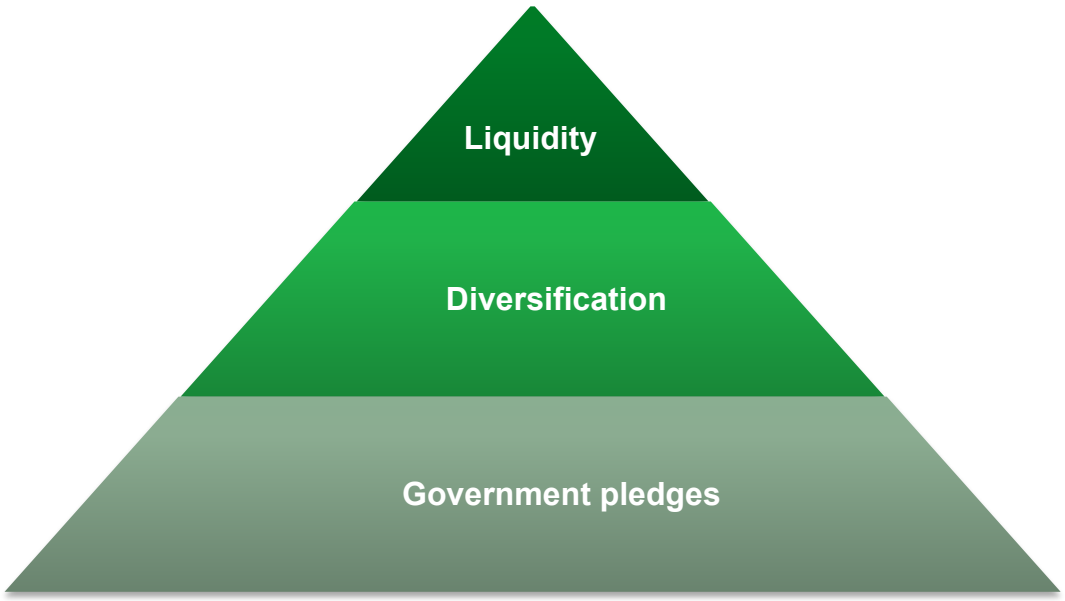
Some of the risks to be discussed are risks that would be applicable to all settlements agents, whereas others relating to the commodity basket are unique to the currency convertibility mechanism and need to be given special attention.

6.2 Basket stability

The stability of the commodity basket's value against Hard currency over time is one of the key requirements for mitigating currency risk. It is therefore crucial to identify strategies to minimise sudden, large depreciations of the basket against the US Dollar, and other hard currencies such as Euro, Swiss Franc, Renminbi and Yen.

The stability of the commodity basket is achieved primarily through the following:

Figure 37: Commodity basket stabilisers



6.2.1 Liquidity

The basket composition should be reflective of the mineral wealth in Africa. Metals and minerals that might be critically important to the green energy transition such as Lithium, but with very few deposits across Africa could not reasonably be assigned a significant weighting in the bucket, even if they proved to provide diversification benefits.

6.2.2 Diversification

Composing the basket of multiple commodities across the whole of Africa enhances the stability of the basket, backing the AUA beyond what a single commodity could provide. In addition to natural diversification benefits, it also mitigates a measure of geopolitical and other idiosyncratic risk factors.

The weights assigned to the commodities included in the basket are to be selected to reduce price volatility as well as the probability of severe drawdowns.

6.2.3 Government pledging

Ensuring that the gearing ratio and headroom, representing the value of the pledged commodity trades to liabilities from AUA-denominated loans, remains low is key in stabilising the AUA. This gearing ratio is comparable to the loan-to-value ratio used in commercial banking, with the haircut playing a quasi-similar role to a deposit in the loan framework.

6.3 Key financial risks

The value of the commodity basket is estimated in Hard currency at the time the pledge is submitted and officialised.

This valuation establishes a reference amount for AUA per unit of the basket which remains constant throughout the duration of the loan, and an initial reference rate of exchange for AUA in Hard currency that fluctuates over time.

The parity as established is, however, subject to several risks. If these risks were to materialise, they will result in a depreciation in value of the commodity basket, potentially leading to a request for additional pledge from the member countries to maintain the integrity of the currency convertibility mechanism.

6.3.1 Basis risk

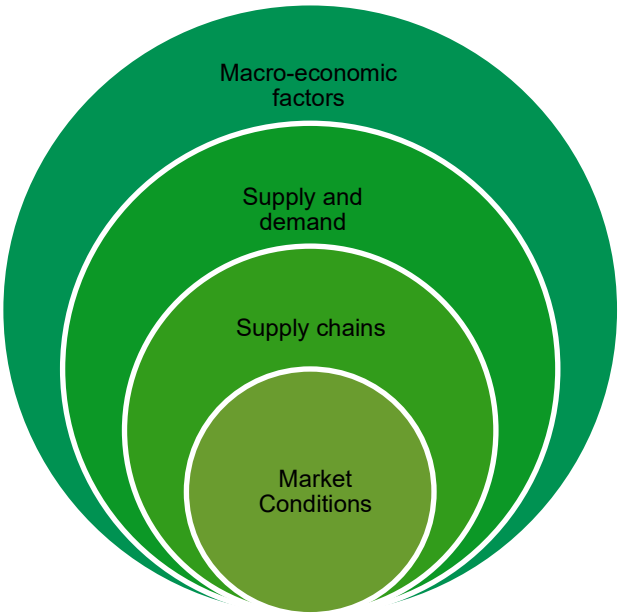
The basis risk arises when the intrinsic value of one or more components of the commodity basket severely depreciates causing a substantial difference in composition between the actual and optimal basket.

Basis risk causes a tracking error between the actual basket and the optimal one that might require periodic rebalancing to realign them.

6.3.2 Price risk

Price risk[30] arises from the changes in supply and demand for the component commodities that could result in the sharp or continuous deterioration in the value of one or more components of the commodity basket.

The main drivers of price risk are broadly discussed below.



Macro-economic

- Geopolitical factors, and policies can drive price risk.

Supply and demand

- Technology driven demand for batteries or other electrical components as well as mining and manufacturing infrastructure.

Supply chains

- Availability of transportation and storage infrastructure such as ports, roads, and warehouses.

Market conditions

- Business cycle or poor market performance.

[30] Also called directional or delta risk.

6.3.3 Correlation risk and diversification benefits

Correlation risk arises when the components in a basket are highly correlated, therefore decreasing the diversification benefits of grouping different commodities and allowing the basket to suffer severe losses.

Table 7: Commodity correlation matrix

	Platinum	Silver	Palladium	Gold	Copper	Tin	Nickel	Brent Crude	Lead	Natural Gas	Cobalt	Uranium	Lithium	Coal	Manganese
Platinum	100%	64%	59%	59%	38%	29%	28%	27%	25%	6%	4%	3%	2%	-1%	-1%
Silver	64%	100%	46%	78%	36%	25%	26%	23%	25%	4%	4%	2%	3%	0%	-2%
Palladium	59%	46%	100%	37%	38%	31%	29%	28%	28%	5%	3%	4%	3%	3%	-2%
Gold	59%	78%	37%	100%	23%	18%	17%	12%	16%	1%	3%	3%	1%	1%	-2%
Copper	38%	36%	38%	23%	100%	42%	44%	29%	46%	3%	6%	0%	3%	4%	-1%
Tin	29%	25%	31%	18%	42%	100%	42%	20%	40%	5%	4%	1%	3%	1%	0%
Nickel	28%	26%	29%	17%	44%	42%	100%	22%	40%	4%	5%	0%	4%	3%	-1%
Brent Crude	27%	23%	28%	12%	29%	20%	22%	100%	17%	9%	2%	-1%	5%	7%	-3%
Lead	25%	25%	28%	16%	46%	40%	40%	17%	100%	4%	4%	0%	1%	2%	0%
Natural Gas	6%	4%	5%	1%	3%	5%	4%	9%	4%	100%	-1%	1%	2%	3%	-2%
Cobalt	4%	4%	3%	3%	6%	4%	5%	2%	4%	-1%	100%	2%	2%	1%	-1%
Uranium	3%	2%	4%	3%	0%	1%	0%	-1%	0%	1%	2%	100%	-2%	2%	-2%
Lithium	2%	3%	3%	1%	3%	3%	4%	5%	1%	2%	2%	-2%	100%	2%	2%
Coal	-1%	0%	3%	1%	4%	1%	3%	7%	2%	3%	1%	2%	2%	100%	2%
Manganese	-1%	-2%	-2%	-2%	-1%	0%	-1%	-3%	0%	-2%	-1%	-2%	2%	2%	100%

The figure above displays a correlation matrix between several commodities, illustrating the strength and direction of relationships between them. Ideally, we seek commodities that exhibit negative correlations with each other, as these can enhance the stability of the basket through the portfolio effect. Negative correlations imply that, when the price of one commodity decreases, the price of the other tends to increase, and vice versa. This inverse relationship helps to reduce overall portfolio risk and volatility, as losses in one commodity can be offset by gains in another, leading to a more stable and resilient investment portfolio.

Through carefully selecting negatively correlated commodities, we can achieve better diversification, optimise growth, and mitigate risks.

6.3.4 Forward curve risks

Commodities are usually traded in the form of forward contracts. The forward price differs from the current spot[31] market price due to multiple factors. These include interest rates, storage and transportation costs, convenience yield, and expected changes in supply and demand.

Since the commodity trades pledged are long-term contracts, their value would relate more closely to the forward prices than the spot price.

6.3.4.1 Contango

Contango is a phenomenon wherein the future contracts trade above the future expected spot price or where the value of the rights pledged in the basket of commodity trades at a premium above the commodity. This scenario leads to a strong basket and would be typical of high expected future demand or high storage costs where the consumer would find it difficult to stockpile the commodity.

6.3.4.2 Backwardation

Backwardation is a phenomenon wherein the future contracts trade below the expected spot price or more precisely when the value of the rights pledged trades at a discount to the commodity. This scenario leads to a weaker basket and would be expected if demand is expected to decrease, stockpiling is cheap, or the market is pessimistic about the prospects of the realisation of future cash flows from operations.

6.4 Role of settlements agent in managing risk

One of the key responsibilities of the settlements agent is to mitigate the risks discussed above.

- A settlements agent is a financial intermediary that facilitates efficient payment between large counterparties. Within the jurisdiction of a single country, the central bank usually acts as a settlements intermediary between the different banks and big corporations, however, in this context, the settlements agent is acting as a financial intermediary between offshore lenders/investors, borrowers (typically project companies or sponsors operating

[31] The market price of a commodity where ownership transfers from the seller to the buyer immediately after settlement.

renewable energy assets), and the participating African country. The key risks to be managed by the settlements agent include stability and valuation of the commodity basket as well as liquidity and settlement risk.

6.4.1 Risks mitigated by settlements agent

Settlements agents provide a vital service in providing stability to the global financial ecosystem.

6.4.1.1 Settlement risk

Prior to the establishment of the BIS, international transactions were cleared on a peer-to-peer[32] basis. An example of this would be two parties entering into a currency swap agreement, where party A transfers US Dollar to B, followed by B transferring Euro to A. Any delays in B settling their responsibility could cause liquidity stress on A. This temporal mismatch between the payment and receiving leg of the transaction is called settlements risk.

Settlements agents solve this problem efficiently by stepping in as financial intermediary, and providing an escrow payment service which eliminates settlement risk, as the settlements agent only finalises a transaction when all parties have honoured their respective responsibilities.

6.4.1.2 Default risk

Under a peer-to-peer transaction, if a party to a transaction were to default, it could take years for the non-defaulting parties to be reimbursed, and often their recovery will be lower than their initial investment. Settlements agents resolve this, as the investors' funds will be ring fenced until the transaction concludes, which means they will not form part of a bankruptcy unwinding of the defaulting counterparty.

6.4.1.3 Contagion

In a peer-to-peer settlements system, the risks described above could place a significant financial burden on the investor, putting stress on their cash flow. This could lead to further rounds of defaults, which then lead to shocks originating from within the lender, to propagate throughout the global financial system. This effect is known as contagion. Settlements banks mitigate the spread of contagion by making sure all parties will honour their respective transactions before settlement.

6.5 Hedging instruments

In markets with deep liquidity, risks can often be transferred to other counterparties via entering derivative contracts such as futures, options and swaps. These are often used to mitigate price or even correlation[33] risks. For the commodities comprising the basket, the market is not liquid enough to pursue this form of hedging. It would, however, be possible for the settlements agent to pursue a strategy of hedging using derivatives on more liquid commodities that are correlated to the constituents of the basket such as precious metals. This would, however, introduce a degree of basis risk and cost that should be carefully considered.

6.6 Conclusion

The key characteristics that enable the stability of the commodity basket were identified as diversification, liquidity, and the government pledge:

- **Diversification:** Reduces idiosyncratic and geopolitical risks.
- **Liquidity:** Reflective of the mineral wealth of the African continent.
- **Government Pledge:** Provides stability under stress scenarios.

The main financial risks of the commodity basket include basis risk, price and correlation risks, and forward curve risk. The settlements agent will be expected to deploy the several well established tools for managing these risks.

[32] A peer-to-peer transaction is one where settlement is finalised and executed between the two counterparties without an intermediary stepping in between them.

[33] Purchase an option on a basket, and sell options on the individual constituent commodities

07

Summary and key observations

7. Summary and key observations

Analysing the performance of several African currencies and commodities has shown that there are multiple possible combinations of commodities that can be grouped together to form commodity baskets with stable value against major Hard currencies. The stability of the value of this commodity basket will be preserved through the portfolio effect.

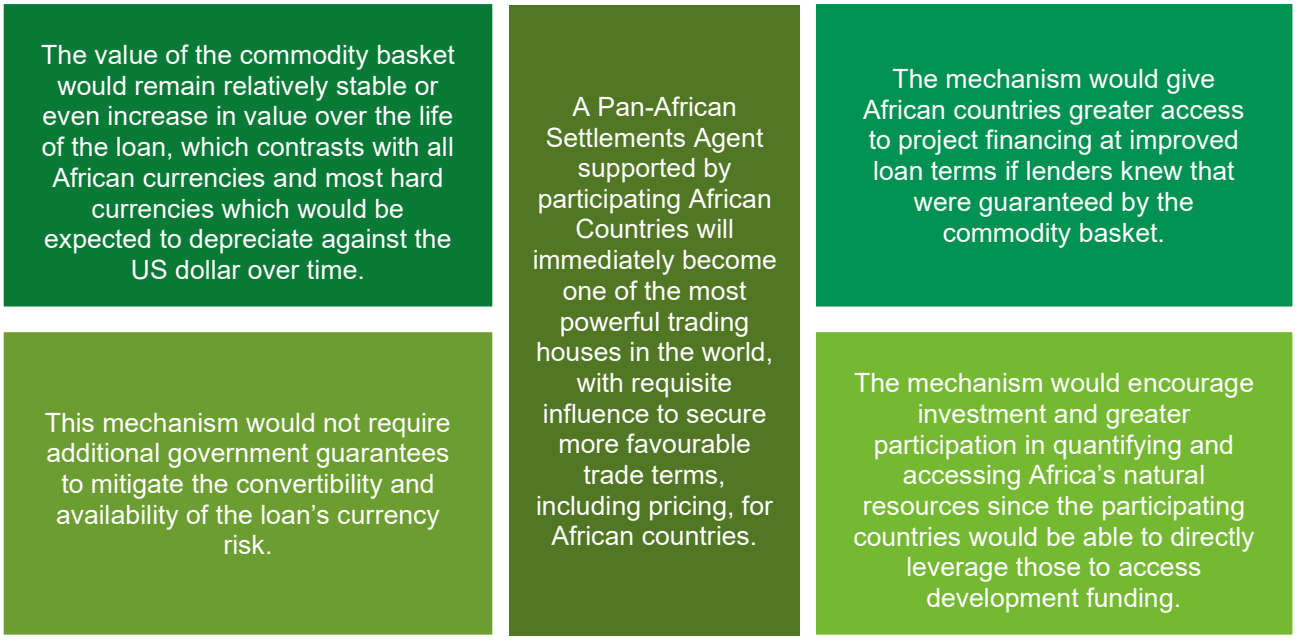
The existence of a stable commodity basket, composed of a combination of commodity pledges from participating African countries, would serve as a tool for accessing greater quantities of project finance at more competitive terms, to be used for development and growth initiatives such as the provision of clean energy. This currency convertibility mechanism would operate through a settlements agent to mitigate the risks associated with currency devaluation and convertibility that are usually associated with such loans.

7.1 Implications of the mechanism

This mechanism will allow the African continent to regain control of their natural resource endowments, and leverage these for greater access to development financing at more favourable terms. The constituent minerals of the baskets analysed have experienced a significant appreciation in value to date and a commodity basket composed of minerals critical to the green energy transition is expected to continue to gain in value in future as they experience increased global demand.

In addition, international lenders would be more willing to lend against projects that were backed by such a currency convertibility mechanism for reasons set out below.:

Figure 38: Advantages of the currency convertibility mechanism backed by the commodity basket



7.2 Benefits for lenders and borrowers

The following benefits for both lenders and borrowers would result from the application of the proposed currency convertibility mechanism:

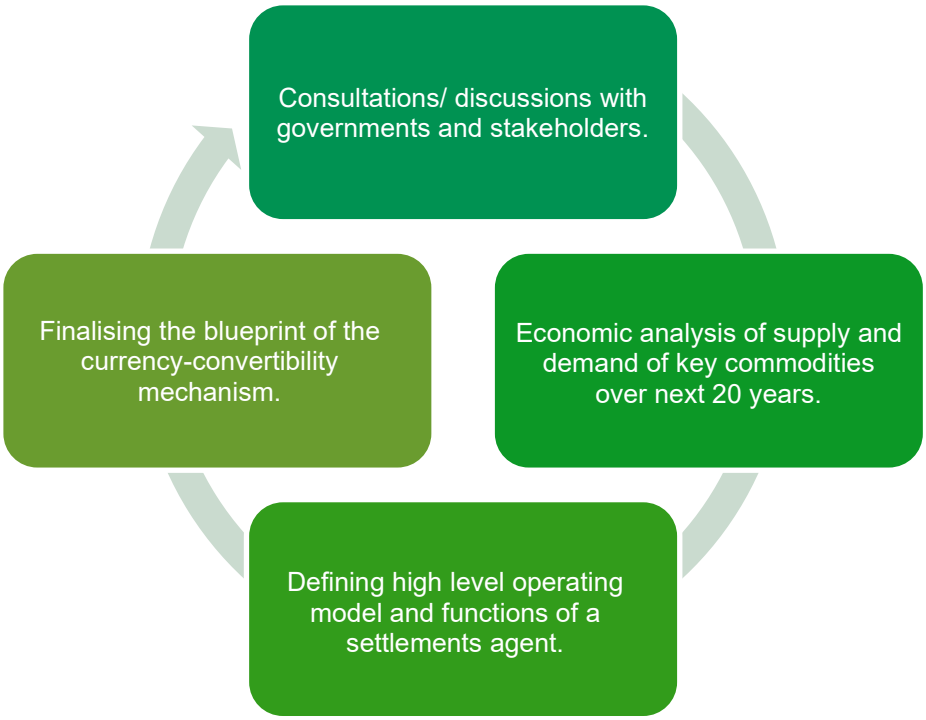
- The proposed currency convertibility mechanism, backed by the settlements agent, would be based on a clear and transparent process for all stakeholders involved. This will be an improvement over certain asset-backed loans signed without appropriate transparency and due diligence process.

- The borrower would be able to borrow in Hard currency and repay the loan in local currency at a fixed exchange rate, without the risks associated with currency devaluation and convertibility. The lender will make the loan in Hard currency and receive repayments in Hard currency at a fixed rate to the AUA.
- The settlements agent can manage its liquidity through the sale and loan of commodities and financial instruments based on the commodity basket.

7.3 Next steps

The next phase of the proof of concept will be to further develop the analysis, to test and refine the hypothesis and better understand the practical implications and complexities of the proposed mechanism. This will culminate in the presentation of a technical paper to the relevant stakeholders for implementation. Figure 39 below depicts the next steps:

Figure 39: Next Steps



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