



CRITIQUE ON NIGERIA'S ENERGY

Transition Plan, Feasibility, Implementation and Challenges



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ABOUT HEDA RESOURCE CENTRE

WHO WE ARE

The Human and Environmental Development Agenda (HEDA Resource Centre) is a leading good governance, anti-corruption, transparency and accountability, climate change, sustainable development and environmental justice organization in Nigeria, founded in November 2001 and duly registered in Nigeria in February 2004 as an incorporated trustee, a non-profit, non-partisan and Non-Governmental Organization (NGO). The organization has observer status with the UN ECOSOC, UNFCCC as well as the Green Climate Fund and membership of several coalitions and networks.

VISION

An Africa where all persons regardless of locations and situation have the freedom and ability to enjoy the benefits of good governance, and respect for human dignity in a sustainable environment.

MISSION

To serve as a policy and advocacy center for research, capacity-building and campaign on accountability, anti-corruption, public participation, environment, good governance, and human rights.

CORE VALUES

- Zero tolerance for discrimination against any person or group of persons based on gender, ethnicity, disability and religion.
- Zero tolerance for all acts perpetrating or encouraging all forms of abuse, violence and discrimination against vulnerable groups in society.
- A principle of equal opportunities, participation and inclusion
- Adherence to best practices in environmental protection, sustainable development, natural resource extraction and biodiversity conservation.
- Strict adherence to integrity, accountability, transparency, and best ethical standards in pursuit of organizational goals and objectives.

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BACKGROUND

In alignment with global initiatives, such as the United Nations Framework Convention on Climate Change (UNFCCC), Nigeria committed to significant climate action during the 2021 United Nations Climate Change Conference (COP 26) where former President Muhammadu Buhari pledged Nigeria's ambition to achieve net-zero emissions by 2060. The legislators responded by enacting the Climate Change Act 2021, which provides a framework for mainstreaming climate change mitigation efforts nationally. Subsequently, the Federal Government launched the Energy Transition Plan (ETP) in August 2022, with a revised target of achieving net-zero emissions by 2060. The ETP outlines six key objectives, ranging from poverty eradication to promoting sustainable economic growth.

Recognizing the pivotal role of stakeholders in implementing the ETP, HEDA conducted a comprehensive study evaluating the plan's feasibility, implementation strategy, resources, and potential challenges. The study, conducted in partnership with Olaniwun Ajayi & Co, one of Nigeria's leading commercial law firms, delves into various aspects, including transition pathways for gas and renewables, legal reforms in the mining sector, and alignment with the National Development Plan. The objective is to provide critical insights and recommendations to enhance Nigeria's ability to achieve its climate goals under the ETP, leveraging internal resources and minimizing reliance on international funding.

This critique is borne out of HEDA's commitment in ensuring that all Ts are crossed and Is dotted in the Federal Government's approach in achieving the nation's energy transition plan and a net zero greenhouse emission by 2060. This publication highlighted important lacunas which should be reviewed for a comprehensive result on our way to achieving clean energy.

ACKNOWLEDGEMENT

This pioneer work of the review of Nigeria's Energy Transition Plan by HEDA was made possible by through the resourcefulness, generosity and coordination of colleagues at the Vance Center for International Justice, New York, USA who facilitated the engagement of the law firm of Olaniwun Ajayi & Co for undertaken this invaluable service pro-bono for our organization and the communities we serve.

This noble work will serve as one of the foundations for the nation's achievement of success in its set out plan if duly considered and implemented by stakeholders and the people adequately empowered to engage with the Energy Transition Pan (ETP) and derive the maximum benefit from it.

Finally, we extend our profound appreciation to the dedicated team of Olaniwun Ajayi and Co for the voluntary and fee free services of developing the critique. We are most grateful. To the New York Bar Association's Vance Centre for international Justice, your facilitation of high-end law firms' pro-bono legal services for victims of human rights abuses and civil society organisations is extremely invaluable in the promotion and protection of human rights.

Staff of HEDA Resource Centre, led by David Ogunbesan have all worked assiduously to ensure the conversion of the critique output to this publication. The management is committed to extensive promotion of the publication and engagement of relevant government officials and other stakeholders for effective consideration of its observations and recommendations.

Thanks to you all

Olanrewaju Suraju

Chair, HEDA Resource Centre

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PART ONE

WHAT ARE THE TRANSITION PATHWAYS FOR GAS TO 2030 AND RENEWABLES BEYOND?

Overview of the Concept of Energy Transition & Need for a Transition Fuel

1. Energy transition is a term used to refer to the intended shift of the global energy sector from fossil-based systems of energy production and consumption - including oil, coal, and other non-renewable sources - to renewable energy sources like wind and solar. Effectively, the energy transition involves a shift from an energy source based on fossil fuels to sources that produce very limited, if not zero, carbon emissions.
2. The concept of energy transition devolves on the global desire to transform the energy sector from its current fossil fuel reliance to lower and more sustainable energy sources with the goal of achieving zero-carbon emissions.
3. A significant derivative concept is the concept of a 'just energy transition'. An energy transition is characterised as just and equitable when it is people-centred and does not come at the expense of indiscriminate groups of people – especially disadvantaged groups who may not have access to clean energy production sources. The concept of a just and equitable energy transition is rooted in energy justice.
4. Historically speaking, energy transitions are not new. In the past, we have seen huge era-defining shifts like the transition from using wood to using coal in the 19th century or from coal to oil in the 20th century. However, what distinguishes this current energy transition from its predecessors is the urgency of protecting the planet from the greatest threat it has ever had to face – global warming and climate change – and doing so as quickly as possible.
5. Notwithstanding, there is a widely accepted view amongst nations that the pace of an outright transition to clean energy source may not be quick enough to achieve a reduction in CO² emissions in the short term and thus the transition has to be a gradual transition. Accordingly, nations have embraced the possibility of a 'stand-in' fuel source which, although not as clean as renewable energy sources, is relatively cleaner than other non-renewable energy sources. For Nigeria and most developing countries, gas has been identified as a transition fuel to meet the energy needs of the populace whilst efforts are made to ramp up renewable energy powered plants.

Gas as a transition fuel under Nigeria's Energy Transition Plan (ETP)

6. Deploying natural gas as a transition fuel entails the substitution of high-content fossil fuels such as coal and crude oil with natural gas, which is considered a low-carbon fuel. The aim of this is to reduce CO² emissions in the near future. Thus, natural gas would play the role of bridging the gap between more polluting fossil fuels and zero-carbon technologies such as wind and solar energy. In the process of this transition, natural gas would, in its various forms, be used to generate electricity, cook, and fuel transportation vehicles, among other things that “dirty” fuels like crude oil previously did.
7. Natural gas is considered a cleaner fuel in the sense that burning it produces fewer conventional air pollutants, like sulphur dioxide and particulates, than burning coal or oil. About 117 (one hundred and seventeen) pounds of CO² is produced per million British thermal units (MMBtu) equivalent of natural gas compared to more than 200 (two hundred) pounds of CO² per MMBtu emitted from the heating of coal and more than 160 (one hundred and sixty) pounds is produced per MMBtu from distillate fuel oil.
8. Accordingly, as renewable energy plants are being built, it is hoped that natural gas can be a stand-in for “dirtier” fuels, like coal and, in some cases, oil. Gas plays many different roles in the energy sector and while it replaces more polluting fuels, it also reduces air pollution and limits emissions of carbon dioxide. According to a study by the IEA's World Energy Outlook team, switching to natural gas has helped to limit the rise in global emissions since 2010, alongside the deployment of renewable and nuclear energy and improvements in energy efficiency. Sometime in 2022, there was an attempt to amend the European taxonomy on sustainable investment to include natural gas as a 'sustainable energy', and whilst this step was heavily debated, the proponents have argued that the labelling of natural gas as sustainable will incentivise countries who use coal to transition to relatively cleaner sources like gas.
9. Thus, switching between different forms of consumption of fossil fuels, on its own, does not provide a long-term answer to climate change, nonetheless, there can be significant CO₂ and air quality benefits, in specific countries, sectors and timeframes, from using less emissions-intensive fuels.

10. Nigeria's Energy Transition Plan (ETP) highlighted that one of the imperatives at the core of its plan is the promotion of a “fair, inclusive and equitable energy transition in Africa that will include Gas as a transitionary fuel”. Thus, it is expected that gas will play a critical role as a transition fuel in Nigeria's net-zero pathway, particularly in the power and cooking sectors.

11. Notwithstanding these benefits of using gas as a transition fuel, it is important to emphasise that this approach is not without its drawbacks, the first being that gas is still a fossil fuel and it emits CO₂ into the atmosphere. Therefore, it is important that stakeholders do not, while utilizing gas (which releases methane) as transitionary fuel, lose sight of the ultimate goal of protecting the climate.

12. With gas, there is also the risk of methane leaks, and the effects of such leaks raise questions as to the relative cleanliness of gas. The leaks pose a risk of environmental problems in the form of fires and explosions as well as being a direct contributor to climate change and this may take away from the characterisation of gas as a cleaner fossil fuel and a transition fuel. It should also be noted that concerns have been raised about the possibility that investments in natural gas might crowd out investments in renewable alternatives.

Practical Implementation Pathways for Gas as a Transition Fuel within the Nigerian Context

13. As stated above, the ETP acknowledges that gas will play a critical role as a transition fuel in Nigeria's net-zero pathway particularly in the cooking, power, and oil sectors. We have provided below an analysis of the proposed pathways under the ETP, the practicality of their attainment, and the challenges to the success of these pathways.

Gas as a transition fuel in cooking

14. With respect to cooking, the ETP envisages the replacement of kerosene, firewood and charcoal with Liquefied Petroleum Gas (LPG) by 2030 whilst contemplating a transition to biogas and electric cookstoves beyond 2030.

15. This is particularly important given that the greenhouse gases generated through the widespread use of “dirty” cooking fuel such as coal, firewood, kerosene and the likes contribute a significant percentage to Nigeria's greenhouse gas emissions. A reduction in the use of these fuels for cooking will result in a significant decrease in Nigeria's emission rates and help attain Nigeria's goal of lowering carbon emissions.

16. The ETP notes that about 40Metric Tonnes of CO₂ can be associated with cooking with traditional fuels and that 175,000.000 (one hundred and seventy-five million) people in Nigeria (about 87% of the population) lack access to clean cooking resulting in a significant reduction in the quality and length of life for mainly women and children in the country.

17. Under the ETP, the key decarbonization strategy reckons that LPG will play a significant role in the transition process up to 2030 due to the urgency required to achieve universal access to clean cooking (SDG7). However, it emphasizes that LPG is simply a stepping-stone in Nigeria's Net Zero strategy.

18. Post-2030, the ETP will prioritise deployment of carbon neutral fuel sources such as biogas and electric cookstoves – with electric cookstoves being primarily used in grid-connected households and biogas being used in areas which employ off-grid sources for primary electricity supply.

19. To achieve these lofty aims, the action steps being considered include (i) the replacement of traditional firewood, kerosene and charcoal by LPG by deploying 2,000,000 (two million) new LPG stoves per year; (ii) post-2030 transition to electric cookstove and biogas with the latter mainly in rural homes by deploying one million seven hundred new electric or biogas stoves. Challenges

20. Currently, the structure of the government's implementation plan is unclear in that it is uncertain if the government intends to: (a) distribute at no cost; (b) sell at a discounted cost; or (c) sell at a cost, the LPG stoves which have been referred to in the ETP. The Investor Deck that accompanies the ETP hints at the government's plan for subsidies for clean cooking solutions generally but does not clarify to what extent these subsidies will be available and whether they will extend to LPG stoves or the biogas and electric cooking alternatives.

21. Where the LPG stoves are not distributed at zero cost, the government faces some practical challenges, particularly affordability and accessibility. In a bid to address the issues of affordability and accessibility for the economically disadvantaged section of the population, Nigeria can consider the programmes implemented in India, a country with a similar socio- economic outlook to Nigeria. To address the issue of affordability, the Indian government has policies in place which include both subsidies and one-time financial assistance. The subsidy is currently structured to apply only to the poorer segment of the population and is aimed at those

who have a real need for it. The programme in India also has subsidies and financial assistance directed towards the distribution network so that more distributors can be created and incentivized.

22. From the perspective of the end-user, in light of prevailing economic conditions in Nigeria the most pragmatic position would be for the government to either distribute the LPG stoves at no cost or at a subsidized cost as implemented in India. In the absence of such financial reprieve, it is doubtful that the portion of the populace who mostly rely on traditional cooking fuels such as firewood would possess the financial resources to acquire these LPG stoves, much less, refuelling the LPG stoves. The drive to promote LPG stoves, especially over the long term, may also require the government to provide incentives to producers and distributors of LPG in order to meet the energy demands of the ever-growing populace. By so doing, the government may help with reducing production cost, thereby reducing the ever-increasing cost of LPG for cooking which may stall the usage of the LPG stoves even where these are handed out at no cost. Ideas for such incentives can be got from what the Central Bank of Nigeria's as in its Guidelines for National Gas Expansion Programme released in 2020. Further, the Petroleum Industry Act, 2021 introduced gas utilisation incentives to midstream petroleum operations and large -scale gas utilisation industries, and additional 5-year tax holiday granted to investors in pipelines and other incentives. The Federal government can apply this existing incentive model(s) with creative model(s) to promote LPG stoves.

23. Accessibility also presents a significant practical challenge to the implementation of the LPG transition. A significant portion of those who rely on traditional cooking gas such as firewood are predominantly found in the more remote areas of the country. Accessibility to these members of the populace may prove a significant hurdle given Nigeria's data collection challenges. Also, there exists the logistic difficulty in providing these LPG stoves to such citizens, as well as the challenge of providing refill depots where they can subsequently procure LPG to fuel their stoves.

Gas as a Transition Fuel in Power

24. The ETP acknowledges that the power sector, including on grid and off grid electricity generation, represents about 27% (twenty seven percent) of in-scope emissions. According to the ETP about 48 (forty-eight) Metric Tonnes CO₂ was emitted in 2020 from the power sector. Emissions in this sector are largely driven by off-grid diesel/petrol generator use and on-grid gas

combustion in power plants. Due to insufficient generation and grid constraints, majority of households, businesses and industries in the country generate their own electricity with diesel/petrol generators and about 80% (eighty percent) of operational energy capacity comes from off-grid diesel/petrol generators.

25. To achieve development goals such as universal access to electricity and industrialization, in light of ever-increasing population, Nigeria requires rapid expansion of electricity generation capacity and production. Consequently, the key strategy in this sector is the elimination of diesel/petrol generators through a phased process and the expansion of generation capacity via renewable sources, primarily solar. However, given the need to establish baseload capacity and facilitate the integration of renewables, there will be an initial ramp-up of gas generation prior to 2030.

26. The action plan for gas as a transition fuel in the power sector involves the “conversion of 5 large- scale gas power plants in phase 1” under a Combined Cycle Generation (CCG) programme. We understand that the aim is to scale up the generation capacity by reliance on gas. This involves significant investment in Nigeria's gas-powered plants to ramp up generation capacity. In addition, research has shown that Combined Cycle Gas Turbines (CCGT) when compared with Open Cycle Gas Turbines (OCGT), is more efficient in converting the energy from gas into electricity, has lower operating costs and emits less greenhouse gas (per megawatt-hour (MWh) of electricity produced. Given that the cost and timeline for constructing a CCGT exceed that required for an OCGT, the CCGT needs to run enough of the time such that its operating cost advantage overcomes its capital cost disadvantage. Thus, in order to profitably run the CCG program, the Government will need to address the issue of low operational capacity of most power plants in Nigeria usually occasioned by lack of transmission infrastructure or vandalization of gas pipelines.

27. Since the majority of Nigeria's power generation plants are gas-powered, the intention to ramp up generation capacity via the expansion and upscaling of these plants presents the most potent immediate solution to meeting Nigeria's energy needs. The approach takes into consideration Nigeria's realities and existing facilities. An increase in the generation capacity of these plants as well as the upgrade of transmission infrastructure will also help reduce the reliance of the populace on self-generated power produced by diesel/petrol generators, thereby significantly cutting down the amount of emissions caused by these practices.



Oil and Gas

28. The utilisation of gas is also expected to play a significant role in the oil and gas industry. In 2020, this sector accounted for 20 (twenty) Metric Tonnes CO₂ of the emissions released over the course of the year and represents about 11% (eleven percent) of in-scope emissions. Emissions from the oil and gas sector are attributable to fugitives, upstream energy consumption (fuel use), venting and flaring.

29. To address the issue of gas venting and flaring, which accounts for 39% (thirty-nine percent) of the emissions in the sector, the decarbonisation strategy involves ensuring improved gas flaring efficiency, as well as exporting/repurposing gas.

30. This is to be achieved through the Nigeria Gas Flare Commercialization Programme (NGFCP). This programme aims to ultimately eliminate gas flaring by reducing Nigeria's emissions by thirteen (13) million tons of CO₂ per year whilst generating significant revenue for the country. The programme which had been previously developed in 2016 is now integrated into the ETP and was relaunched in 2022.

<https://www.eia.gov/energyexplained/natural-gas/natural-gas-and-the-environment.php>
<https://www.iea.org/reports/the-role-of-gas-in-todays-energy-transitions>
<https://www.bbc.com/news/world-europe-60229199>

Further to the relaunch, the government has subsequently shortlisted one hundred and thirty-nine (139) business entities as having qualified for the next round of the NGFCP 2022. The core objective of the NGFCP 2022 is to eliminate gas flaring through technically and commercially sustainable gas utilization projects developed by competent third-party investors who will be invited to participate in a competitive and transparent bid process. The NGFCP 2022 will offer flare gas for sale by the Federal Government of Nigeria through a transparent and competitive bidding process. A structure has been devised to provide project bankability for the flare gas buyers, which is essential to the success of the programme. It is hoped that the successful implementation of the programme helps to reduce the amount of emissions released in the oil and gas industry.

<https://energytransition.gov.ng>

It should be noted that methane is the second-most prevalent greenhouse gas, behind CO₂.

See: https://energy.ec.europa.eu/topics/oil-gas-and-coal/methane-emissions_en

<https://www.edf.org/climate/methanemaps/leaks-problem>

C. Gürsan, V. de Gooyert, "The systemic impact of a transition fuel: Does natural gas help or hinder the energy transition?"

Renewable and Sustainable Energy Reviews, Volume 138, 2021.

<https://www.energytransition.gov.ng/cooking/>

<https://www.energytransition.gov.ng/cooking/>

PART TWO

ARE THE AMBITIONS FOR INCREASED GAS USE TILL 2030 REFLECTED IN THE FINANCIAL PLAN IN THE ETP AND DECARBONIZATION PLANS ACROSS THE FIVE SECTORS?

Evaluation of Plans for Decarbonisation and Increased Gas Use under the ETP & Investor Deck

31. The unveiling of the ETP was accompanied by the release of an Investor Deck which is effectively the most proximate document to a financial plan under the ETP. The Investor Deck highlights an initial \$USD23,000,000,000 (Twenty-Three Billion United States Dollars) opportunity for financiers, donors, and other partners to contribute to the delivery of the ETP. The Investor Deck reflects opportunities identified across the value chain, with projects and programmes identified in generation, transmission and distribution (infrastructure upgrade and new distribution connections), metering, gas commercialization, clean cooking, government buildings, e-mobility, healthcare and technical assistance.

Identification of the Specific Allotments made for Increased Gas Reliance.

32. Indeed, the ambitions for increased gas use can be observed in the breakdown of this Investor Deck. Accordingly, some of these reflections on increased gas use are set out as follows:

32.1 Combined Cycle Generation (CCG) Programme: This involves the conversion of 5 large-scale gas power plants. This is expected to involve an upscaling of select gas-powered plants to increase generation capacity. It is projected that this programme will result in CO² savings of at least 12.4 million tonnes per annum and add 3,500MW of additional power capacity to the national grid. The Investor Deck states that about One Billion Four Hundred Million Dollars (\$USD1.4 Billion) financing is required for the realisation of this project.

33.2 Nigeria Gas Flare Commercialization Programme (NGFCP): The programme is involved in a design of up to 89 individual projects, programme management and implementation, and carbon capture study and programme design. It is projected that this programme will help reduce Nigeria's emissions by thirteen (13) million tonnes of CO² per year whilst also earning the country potential annual revenues around US\$1Billion per annum.

The plan also forecasts that over a one and half - two year period, the NGFCP could generate around three hundred thousand (300,000) or more direct and indirect jobs. Per the Investor Deck, around Three Billion Five Hundred Million United States Dollars (\$U.5 billion) in financing is required for this programme.

32.3 Clean Cooking: Here, the Federal government aims to convert about 30 million homes from “dirty” fuels (kerosene, charcoal and diesel) to LPG for cooking, biogas with personal home biogas digesters, community biogas digesters and electric alternatives. It is projected, under the Investor Deck that the totality of these steps will help achieve an annual reduction of 120 million tons of CO² emission. The Investor Deck states that around One Billion Eight Hundred United States Million Dollars (\$USD1.8 billion) in financing is required under this heading – with one billion four hundred million dollars (\$1.4 billion) being required to deploy solutions and build supporting infrastructure, while the Government requires four hundred million dollars (\$400 million) for subsidies.

33. In light of the foregoing, we note that whilst the Investor Deck does reflect, to an extent, the plans for increased gas use as a transition fuel, these reflections have been presented on a very high- level basis with little specification as to how the projected sums were arrived at, or a detailed breakdown of how the sums are intended to be deployed under each heading. For better implementation, it will be useful to design a much-detailed action/implementation plan that clearly spells out the source of funding, the amount to be allocated to each sector and modalities for their disbursement, revenue streams, as well as a mechanism for tracking performance@zz.

According to the National Bureau of Statistics, the 2022 Multidimensional Poverty Index survey revealed that 63% of persons living within Nigeria (roughly 133 million people) are multidimensionally poor.

According to the National Bureau of Statistics in 2022, the price of cooking gas in Nigeria increased by 101% over a one- year period. See: <https://www.premiumtimesng.com/news/top-news/555110-price-of-cooking-gas-in-nigeria-up-101-in- one-year-nbs.html>

As part of its efforts at stimulating finance to critical sectors of the economy, the Central Bank of Nigeria released and introduced the NGN250 billion intervention facility to help stimulate investment in the gas value chain. Term loans advanced under this scheme are determined based on the activity and shall not exceed N10 billion per obligor at a reduced interest rate of not more than 5% up till 28th February 2021. Thereafter, interest on the facility shall revert to 9% p.a. (a ll inclusive) effective from 1st March 2021.

PART THREE

DOES THE ETP FIT INTO THE NATIONAL DEVELOPMENT PLAN 2021-2025?

A Brief Overview of the National Development Plan 2021-2025 (NDP)

34. Prior to the NDP, Vision 2020 was introduced in 2009, targeted at improving the welfare and living standards of Nigerians and placing the country among the top 20 economies in the world. Its objective was to reduce inflation and increase the availability of infrastructural facilities to drive the economy. Vision 2020 recorded some progress as the country's GDP improved from 30th position to 27th position, and its corruption rating also improved. However, inadequate financial resources, negative shocks from the global oil market, poor public funding and a lot more hindered the implementation of Vision 2020. At the last phase of Vision 2020, the Federal Government of Nigeria introduced the Economic Recovery and Growth Plan (ERGP 2017-2020) (the ERGP) to drive sustainable, accelerated development; restore economic growth and promote national prosperity through investment in infrastructure, digital economy and improved business environment.

35. As an emergency recovery plan, the total performance of the economy during the ERGP years was commendable until the occurrence of the sudden wave of COVID-19 Pandemic and its effect on the crude oil market, government finances and foreign exchange earnings.

36. In response to the challenges of COVID-19 Pandemic, the Economic Sustainability Plan (ESP) was developed. The ESP contained policies, projects and measures focused on resuscitating every sector of the Nigerian economy, job creation, prevention of deep recession and speedy recovery of the economy post the COVID-19 Pandemic. The ESP contributed greatly to Nigeria's economy and growth post COVID-19 Pandemic. Some of the programmes implemented during the ESP Phase continued in the NDP.

37. The NDP is a medium-term blueprint inaugurated by the President of Nigeria designed to solve the current problems in the country including infrastructure deficits, low economic development, insecurity, climate change and weak institutions, among others. The NDP replaces and builds on the achievements of, and lessons from, the EGRP. The NDP, like the previous National Development Plans is anchored on Chapter II of the 1999 Constitution of the Federal Republic of Nigeria (as amended), which sets out the fundamental objectives and directive principles of state policy.

The NDP takes a holistic and inclusive approach to national development by assessing all sectors of the Nigerian economy, considering their individual potentials and the appropriate strategies for maximising these potentials for economic growth.

38. The mission of the NDP is to guide the implementation of programmes and policies that promote rapid multi-sectoral growth and development of the country's economy. To achieve this, the NDP is guided by four strategic objectives: (a) establishing a strong foundation for a concentric diversified economy; (b) investment in critical physical, financial, science and innovation infrastructure; (c) building a solid framework and enhancing capacities to strengthen security and ensure good governance; and (d) enabling a vibrant, educated and healthy populace.

39. On establishing a strong foundation for a concentric diversified economy, the plan of the NDP is to strengthen the economy by promoting the key sectors that drive the bulk of Nigeria's Gross Domestic Product (GDP); agriculture, manufacturing, trade and the oil and gas sector. These sectors account for 60% of Nigeria's GDP. In achieving this objective, the country will invest in supporting Micro, Small and Medium Enterprises (MSME) growth and strengthening the enabling business environment. The second objective of the NDP will be attained by investments in infrastructure for economic and social development including physical infrastructure to facilitate business operations and the movement of goods and people; financial infrastructure to promote business growth and individual economic security and technology and innovation infrastructure to lead Nigeria to efficiency and innovative ways of producing in the economy.

40. The third objective of the NDP aims to address subsisting bottlenecks in the country's governance structures through accountability, human and technological development. This objective recognizes that Nigeria's socio-economic aspirations can only be achieved within the context of peace, security and stability. The NDP acknowledges the crucial role of education and good health in improving quality of life by its fourth objective which focuses on increasing productivity, national economic growth and alleviating poverty.

41. The NDP is structured around 6 (six) thematic areas: economic growth and development, infrastructure, public administration, human capital development, social development and regional development. The economic growth and development theme is keen on critical sectors that currently drive economic growth and proposes interventions such as strengthening value chain linkages by promoting local sourcing and value addition; launching financial interventions to finance manufacturing expansion; increasing oil production through adequate investment in the upstream subsector while reducing the overall cost of production; creating linkages across the mineral sector for value addition to enhance local production and job creation; and increasing focus on the tourism sector through local asset maintenance and global marketing campaigns. Business environment initiatives such as leveraging technology to improve efficiencies and overall competitiveness will be initiated to support these interventions.

42. Under the infrastructure theme, the NDP covers five key sectors – transportation, power, housing, digital economy and capital markets. The plan for this theme is to dedicate significant resources to the rehabilitation, maintenance and expansion of Nigeria's infrastructure assets. Exploring innovative financing mechanisms for continued development of transport infrastructure; resolving value-chain specific constraints to unlock added energy for Nigerians by optimizing existing capacity; introducing and adopting low-cost production technologies and innovative affordable housing delivery methods. The digital economy ecosystem will be strengthened by increasing financial and technical support through local and foreign investment. The goal of the public administration theme is to build formidable sustainable governance structures for efficient institutions that promote citizen participation and ensures accountability. Increasing border control and domestic anti-terrorism measures through bilateral security agreements, supporting border control agencies, and promoting coordination between tiers of government are interventions introduced by the NDP for this theme.

43. Strategic measures introduced by the NDP in the area of human capital development are (I) improving the quality of education to meet international standards through teacher training (ii) strengthening Nigeria's health system service delivery capacity, to significantly improve quality and become a healthier, more productive nation. On social development, some of the interventions introduced by the NDP include designing a coordinated investment plan to secure required funding for water and sanitation management;

supporting the economic empowerment of women by facilitating access to financing; strengthening existing population, job creation and poverty alleviation initiatives, such as diversifying revenue-generating streams to finance social protection initiatives and creating inter-sector linkages to unlock the potential of high growth sector sectors critical to achieving the job target. The regional development theme has the strategic objective to attain sustainable socioeconomic development across all regions of the country to minimize regional economic and social disparity. The Nigerian government will pursue economic and social sustainability across states by unlocking local production opportunities in areas of comparative advantage and putting quality social services in place.

44. Overall, the NDP is a laudable and feasible plan to move all sectors of the Nigerian economy forward. However, the attainment of the NDP hinges on cooperation from all tiers of government, effective leadership, deployment and management of capital and human resources.

Interplay between the ETP & NDP

45. The ETP is a multipronged strategy developed for the achievement of net-zero emissions in terms of the nation's energy consumption. It sets out a timeline and framework for the attainment of emissions reduction across 5 (five) key sectors: power, cooking, oil and gas, transport and industry. The ETP is designed to achieve carbon neutrality, ending energy poverty and driving economic growth. The NDP, on the other hand, is a medium-term strategy developed by the Federal Government of Nigeria designed to unlock the country's potential in all sectors of the Nigerian economy. Thus, the entire goal of the ETP is a portion of the NDP as the ETP is solely focused on Nigeria's energy sector, whereas the NDP focuses on all sectors of the Nigerian economy. Despite the difference, there are certain areas of similarities and alignment between the NDP and the ETP.

Infrastructure

46. Under the Infrastructure theme of the NDP, the NDP acknowledges the central role of power to the Nigerian economy, enhancing competitiveness and ensuring quality of life for Nigerians. The NDP also recognizes that the country's current energy mix is driven mostly by natural gas and hydropower despite an abundance of renewable energy sources such as solar and wind energy which are more environmentally friendly. The intervention proposed by the NDP is that the government will ramp up and leverage renewable energy to reduce the number of residents without access to electricity.

To achieve this, 1125MW will be realized from 14 Solar IPP Projects that have existing licenses and PPAs with NBET and a cumulative of 475MW will be realized from off-grid renewable energy projects. At an average of 10MW per project, this indicates that a total of approximately 50 off-grid renewable energy projects will be implemented by 2025. The ETP aligns with NDP in this regard in that both plans propose:

- i) A transition away from diesel/petrol generators;
- ii) initial expansion of gas generation capacity to establish baseload capacity for meeting increased electricity demand;
- iii) integration of renewables;
- iv) ramp up of existing renewables-backed electrification to facilitate decarbonization in sectors such as buildings (cooking), industry and transportation.

Economic Growth

47. Furthermore, the first theme of the NDP is economic growth and development and as earlier stated, the objective of the government under this theme is to improve the key sectors of the economy (agriculture, oil and gas, solid minerals manufacturing and creative industry) and strengthen the other sectors in order to create more jobs and alleviate poverty in Nigeria. The first core objective of the ETP conforms with the NDP - to lift 100 million Nigerians out of poverty and drive economic growth. The ETP is also keen on job creation in view of the long-term expected job loss in the oil sector as there may be less reliance on oil as a source for fuel. Both plans are geared toward maximizing the immense use of energy resources in Nigeria to improve the national economy.

Gas Development

48. Under the ETP, gas is proposed as a transition fuel in Nigeria's net-zero pathway particularly in the power and cooking sectors. The NDP's target is to achieve full supply of gas required for all thermal power generation plants currently installed all over Nigeria (Private Generating Companies, National Integrated Power Projects, Independent Power Producers), and to activate all subsisting contracts. Another area of alignment between the ETP and the NDP is in relation to investment in the energy sector. The NDP seeks to achieve a gas-based industrial development for Nigeria through gas feedstock availability, construction of gas processing plants and development of industries that consume intermediate products of gas processing plants. Both plans were designed to improve or enable investments in the power sector, especially renewable energy.

Under the NDP, the government plans to allocate NGN598 billion for executing strategies and initiatives planned for the energy sector between 2021 and 2025. These include measures to strengthen all aspects of the energy value chain including alternative energy sources and improve overall system reliability. The NDP also expressly supports the provisions of the Petroleum Industry Act, 2021 in relation to gas flaring to keep the environment safe for Nigerians which is also one of the goals of the ETP.

49. The NDP and ETP are both plans developed and implemented by the Federal Government of Nigeria to boost the economy and drive the country towards its energy and climate goals. Both plans are interrelated but also different from each other.

Ultimately, the end goal of both plans is to alleviate poverty, increase enterprise in the country, boost the national economy, and keep Nigerians healthy within the country.

It should be noted that this may still be an issue to contend with even where the LPG stoves are distributed at zero cost.

<https://www.energytransition.gov.ng/power/>

<https://www.energytransition.gov.ng/power/>

<https://www.energytransition.gov.ng/power/>

See the ETP Investor Deck.

<https://www.energytransition.gov.ng/wp-content/uploads/2022/05/Investing-in-Nigeria-Energy-Transition.pdf>

PART FOUR

WHAT LEGAL REFORMS SHOULD BE ADOPTED IN THE MINING SECTOR TO CREATE AN ENABLING ENVIRONMENT FOR NIGERIA TO BENEFIT FROM THE USE OF ITS CRITICAL MINERALS FOR CLEAN ENERGY DEVELOPMENT?

Critical Minerals and their Role in Achieving Nigeria's Clean Energy Development Objectives.

50. Nigeria's clean energy development objectives involve shifting the country's energy production away from fossil fuels and towards clean energy sources, such as solar and wind power. During the COP26 summit in Glasgow, President Buhari pledged that Nigeria would cut its carbon emissions and reach net zero by 2060. The efforts to reduce greenhouse gas emissions to net zero calls for the massive deployment of a wide range of clean energy technologies, many of which rely on critical minerals such as copper, lithium, nickel, cobalt and rare earth elements.

51. A critical mineral is a metallic or non-metallic element that is essential for modern technologies, economies, or national security, and has a supply chain at risk of disruption. These minerals are called critical because they are rare and difficult to find, making them valuable. Nigeria has been identified as a country with significant deposits of some critical minerals. Lithium and tantalite are found in parts of the extensive pegmatite belts of Nigeria. Lithium is mined by artisanal miners in Kogi, Kwara, Ekiti and Cross River States; tantalite, tin and nickel are found in Plateau, Nasarawa, Kogi, and several other states. A large amount of rare earth minerals was discovered in pegmatite and granites in Nigeria. Graphite is also found in Kaduna State.

52. Critical minerals play an essential role in achieving Nigeria's clean energy development objectives as they are needed for making technology used in clean energy production, such as solar panels, wind turbines, and batteries for electric vehicles and energy storage. In the absence of critical minerals, it would be difficult to develop clean energy technology, which would hinder Nigeria's efforts to transition to clean energy.

53. Furthermore, critical minerals, particularly lithium, cobalt, and rare earth elements, are vital for the production of high-performance batteries used in energy storage systems. Rare earth elements are crucial in producing powerful magnets essential for wind turbines and electric vehicles (EVs). Copper and aluminium are in high demand for electricity networks. Nickel or platinum group metals are required for hydrogen electrolyzers and fuel cells, depending on the technology used. Copper is an indispensable element for nearly all electricity-related technologies.

54. Nigeria can achieve sustainable economic growth and its energy transition goals by harnessing its critical mineral resource towards the manufacture of renewable energy component, thereby reducing the country's reliance on importation of these components. In addition, exploitation of Nigeria's critical mineral resources will contribute to job creation, export potential, economic diversification, and foreign investment.

Proposal for Legal Reforms to be Adopted in the Nigerian Mining Sector: Australia as a Case Study

55. Australia is known for its rich reserves of critical minerals and has implemented various strategies to leverage its resources and benefit from their use. With approximately half of the world's lithium production and ranking as the second-largest producer of cobalt and the fourth-largest producer of rare earth, Australia has positioned itself as a global leader in critical minerals.

56. The Australian government has been proactive in transforming the country into a critical minerals powerhouse by capitalizing on its robust resources sector, mineral processing expertise, and highly skilled workforce. It is also committed to growing Australia's critical minerals resources and industries which will be crucial to enabling Australia and the world to meet its commitments to net zero emissions by 2050.

57. One notable initiative is the Critical Minerals Accelerator Initiative (CMAI), which received a commitment from the Australian Government in the sum of \$200 million. The CMAI aims to support strategically significant projects throughout their development stages, enabling the establishment of new supply sources. This initiative plays a crucial role in building robust global supply chains, strengthening Australia's sovereign capability, and creating high-paying regional jobs. The CMAI will help projects overcome technical and market barriers by supporting activities such as feasibility studies, engineering design work, pilot testing, and building demonstration plants to help proponents improve the quality of their products and secure contracts with customers.

58. Recognizing the importance of research and development, the Australian government allocated \$50million over three (3) years to establish the virtual National Critical Minerals Research and Development Centre.

This center brings together the expertise of renowned research organizations, including the Commonwealth Scientific and Industrial Research Organisation (CSIRO), Geoscience Australia, and the Australian Nuclear Science and Technology Organisation (ANSTO). These organisations' research partnerships and technical services have contributed innovative, safe, and efficient ore processing and purification techniques.

59. To provide policy guidance and strategic advice while promoting sector development, the Australian government established the Critical Minerals Facilitation Office in 2019. Since its inception, the country has witnessed substantial growth in the critical minerals sector and expedited progress of various projects.

60. Australia's overarching strategy for critical minerals is reflected in its Critical Minerals Strategy, first introduced in 2019 and subsequently updated in 2022. The strategy aims to position Australia at the forefront of meeting global demand for critical minerals. It emphasizes the importance of reliable, secure, and resilient supplies of critical minerals, not only for the prosperity and security of Australia but also for the Indo-Pacific region. The strategy outlines a long-term plan to foster the development of a thriving and durable Australian critical minerals sector.

61. To address financing challenges, the Australian government established the \$2 billion Critical Minerals Facility in 2021. Administered by Export Finance Australia, this facility supports projects aligned with the Critical Minerals Strategy by bridging gaps in private finance. By doing so, it provides crucial support to the sector, preserving jobs, empowering communities, and bolstering the strategic significance of critical minerals within the Australian economy.

62. Recognizing the pivotal role of manufacturing in advancing critical minerals projects, the government's \$1.3 billion Modern Manufacturing Initiative (MMI) offers funding opportunities for mid-stage projects. This funding assists firms in piloting, demonstrating, and scaling up techniques and processes required for commercial viability.

63. Since the initial release of the Critical Minerals Strategy in 2019, Australia has made significant progress in strengthening relationships with commercial and government stakeholders in key markets. By building on these existing connections, Australia aims to further develop its strategic partnerships. This strategic focus is essential in positioning Australia as a preferred supplier of critical minerals, particularly in markets where countries

prioritize sourcing from ethical and Committed to the constant improvement of its critical minerals sector, Australia is reviewing its Critical Minerals Strategy, 2023 (the Strategy) and this Strategy will reflect the country's target of achieving net zero. The key themes that will be considered in the review include:

63.1 The role of critical minerals as essential inputs to the clean energy technologies required to achieve global emissions reduction targets.

63.2 The opportunity for Australia to play a significant, global role in the clean energy transition.

63.3 The continued importance of stable supply, particularly with the significant increases in demand forecast to 2040, through the development of new sources of supply and the establishment of robust, diverse supply chains.

63.4 The ongoing need to attract investment required to support critical minerals projects, including by further strengthening strategic and commercial international partnerships.

63.5 Key areas where government support (at all levels) would help grow the sector.

63.6 The government and industry's ongoing commitment to the highest Environmental Social and Governance Standards (ESG) and engagement with First Nations Australians.

63.7 Connections between the Critical Minerals Strategy and other government priorities, including Powering Australia, the Battery Strategy, the Electric Vehicles Strategy and the National Reconstruction Fund.

64. From the foregoing, Australia has implemented a range of effective strategies to ensure that it benefits from the use of its critical minerals. By capitalizing on its resources, fostering innovation, and establishing strategic partnerships, Australia aims to position itself as a global leader in meeting the growing demand for critical minerals.

65. Nigeria can adopt a similar approach by capitalizing on its own strengths and fostering innovation within its mining sector. The following are reforms Nigeria could implement in its mining sector to ensure it benefits from the use of its critical minerals:

65.1 Establishment of a Critical Minerals Strategy: Developing a comprehensive Critical Minerals Strategy that aligns with its clean energy development objectives is vital for Nigeria. This strategy should outline a long-term plan to leverage critical minerals for clean energy



technologies, ensuring reliable and sustainable supplies while contributing to the country's economic prosperity. The strategy should also be subject to periodic review as is done in Australia.

65.2 Establishment of Supportive Initiatives: Nigeria can establish a comparable program to Australia's CMAI that focuses on providing support for early and mid-stage projects within the critical minerals sector. By assisting with feasibility studies, engineering design work, pilot testing, and building demonstration plants, Nigeria can enable project proponents to demonstrate the quality of their products and secure contracts with customers. This will contribute to building a robust supply chain and generating high-paying regional jobs.

65.3 Establishment of a Critical Minerals Agency: Nigeria could establish a dedicated agency or office, like Australia's Critical Minerals Facilitation Office, to provide policy guidance and strategic advice. This entity can facilitate the development of the critical minerals sector by coordinating efforts, streamlining regulatory processes, and promoting investment.

65.4 Financial Support: To address financing challenges, Nigeria can consider establishing financing mechanisms like Australia's Critical Minerals Facility and Modern Manufacturing Initiative. These initiatives bridge gaps in private finance and provide the necessary support to mid-stage projects. By facilitating access to funding and technical expertise, Nigeria can accelerate the commercialization and scale-up of critical minerals projects for clean energy development.

65.5 Foster International Partnerships: International engagement and partnerships should be prioritized. Strengthening collaborations with commercial and government stakeholders in critical mineral markets will enable Nigeria to leverage global expertise, technology transfer, and market opportunities.

66. Nigeria has the potential to benefit immensely from the use of its critical minerals for clean energy development. By implementing the foregoing legal reforms, Nigeria can unlock the economic and environmental advantages of its critical minerals. This will pave the way for sustainable clean energy development and position Nigeria as a leading player in the critical minerals sector.

Most gas power plants in Nigeria are open cycle turbines.
<https://www.energyforgrowth.org/memo/should-lower-income-countries-build-open-cycle-or-combined-cycle-gas-turbines/>
<https://www.energytransition.gov.ng/oil-and-gas-2-2/>
<https://www.energytransition.gov.ng/oil-and-gas-2-2/>

PART FIVE

WHAT POLICIES NEED TO BE PUT IN PLACE TO ENSURE MINERALS ARE MINED AND VALUE IS ADDED IN THE COUNTRY TO ENSURE EMPLOYMENT BENEFITS AND REVENUES REMAIN IN THE COUNTRY TO SUPPORT ECONOMIC GROWTH?

Introduction

67. The Nigerian mining sector holds significant potential for economic growth and diversification. The sector is rich in mineral resources, including solid minerals such as gold, limestone, coal, tin and columbite. However, the sector faces various challenges and constraints in promoting and protecting local content and value retention. This section of the report aims to provide an analysis of the current challenges and constraints in the Nigeria mining sector, focusing on the promotion and protection of local content and value retention.

68. Organised mining in Nigeria commenced in 1903 with the mining of minerals such as tantalite, columbite and coal. The growth in mining activities necessitated regulation and as such in 1946 the Minerals Ordinance was passed, followed by the Coal Ordinance of 1950.

69. Recent information from the Ministry of Mines and Steel Development indicates that about 38 foreign investors holding 421 exploration licenses have commenced mining exploration activities in Nigeria. Some of these investments include investments made by Australian stock exchange-listed companies such as Energio Limited, which is developing the Agbaja Iron Ore Project, and Australian Mines Limited, which is developing gold projects in the Yargarma and Kasele areas, located in the gold province of north-west Nigeria. There are other notable agreements signifying intent to invest in Nigeria's solid minerals sector such as the recent memorandum of understanding executed between the federal government and Glencore International plc for Glencore to invest \$1 billion in the Nigerian mining industry. In addition, China-based Shenzhen Investment and some private investors are looking at injecting approximately 7 billion naira into the Zamfara Minerals Processing factory, in Zamfara State, northern Nigeria.

Current Challenges and Constraints

70. Insufficient infrastructure development, encompassing transportation networks and power supply, severely impedes the mining sector's expansion. It amplifies operational expenses and effectively discourages local enhancement and preservation of value. This lack of adequate infrastructure obstructs the sector's growth potential and hinders efforts to promote value-added activities within Nigeria.

71. Limited availability of funding for mining projects, especially for local companies, presents a persistent challenge. Financial institutions often exhibit reluctance to provide loans due to perceived risks associated with the sector, consequently making it arduous for local players to invest in value-added activities. This dearth of financial support hampers the sector's growth potential and restricts the involvement of local entities.

The capacity of government agencies tasked with regulating and promoting the mining sector often falls short of requirements. Inadequate technical expertise, limited monitoring and enforcement capabilities, and prevalent corruption undermine the effective implementation of local content and value retention initiatives. Insufficient governmental capacity hampers the sector's development and obstructs the achievement of sustainable practices.

72. The mining sector in Nigeria predominantly witnesses the dominance of foreign companies in exploration and extraction activities, resulting in limited local participation. This lack of local involvement restricts the transfer of crucial technology, knowledge, and skills to domestic players and impedes the progression of value-added endeavours within the sector.

73. Mining activities can engender adverse environmental and social impacts, potentially leading to conflicts with local and host communities. Inadequate environmental regulations and insufficient community engagement measures pose formidable challenges in ensuring sustainable mining practices and promoting the incorporation of local content and value retention strategies. Addressing these challenges is imperative for fostering responsible mining practices and effectively benefiting locals.

74. The prevailing level of insecurity across the nation poses a significant threat to the growth and development of the mining sector. These security concerns exert a detrimental impact on the sector's progress, resulting in sluggish growth and delayed realization of the potential benefits associated with the mining industry. Overcoming these security challenges is vital to unlocking the sector's true potential and facilitating its growth and prosperity.

Strategies to Promote and Protect Local Content and Value Retention

75. The government should establish a stable and predictable policy framework for the mining sector. Long-term policies that promote local content, value addition, and technology transfer need to be developed and consistently enforced.

76. Investment in critical infrastructure, such as roads, rail networks, and power supply, is essential to support mining operations. Improved infrastructure will reduce costs, enhance competitiveness, and facilitate local value retention.

77. The government should collaborate with financial institutions to create specialized funding mechanisms, such as mining development funds or loan guarantees, to facilitate access to capital for local mining companies interested in value-added activities.

78. Enhancing the technical skills and knowledge of local players through training programs, partnerships with international mining companies, and technology transfer initiatives can promote local content and value retention. The government should prioritize initiatives that encourage knowledge sharing and collaboration.

79. Building the capacity of regulatory institutions responsible for overseeing the mining sector is crucial. This includes improving monitoring and enforcement capabilities, reducing corruption risks, and streamlining bureaucratic processes.

80. Stringent environmental regulations should be established and enforced to ensure responsible mining practices. Mining companies should engage in proactive community development initiatives, including job creation and infrastructure development.

Analysis of the extant Mining Laws and Regulations in Nigeria.

81. The Nigerian mining sector is governed by a range of laws and regulations, including the Nigerian Minerals and Mining Act, the Minerals and Mining Regulations 2011, the 1999 Constitution as amended and other relevant legislation. These laws aim to provide a legal framework for mining operations, promote transparency, attract investment, protect the environment, and ensure social and economic benefits for local communities.

82. The Nigerian Minerals and Mining Act 2007 (the Mining Act) serves as the primary legislation governing mining activities. It provides for the exploration, exploitation, and processing of mineral resources, as well as the rights and obligations of mining title holders.

Section 4 of the Mining Act provides for a plethora of duties the Minister for Mines and Steels' development is to carry out in pursuance of the Mining Act, some of which includes; ensuring the orderly and sustainable development of Mineral resources in Nigeria, developing a well-planned and coherent program of mineral resource exploitation that takes into account economic development and ecological factors, establishing the procedure for monitoring development in the solid minerals sector, and encouraging private sector investment in mineral resources development etc.

83. The Minerals and Mining Regulations (the Mining Regulations) generally covers the following aspects; the processes and procedure for the regulation of exploration and mining operations generally, including the acquisition of the titles to engage in such operations; the safeguards to protect and ensure the safety of mining workers, the general public and mining environments; the forms prescribed for use in applying the Regulations to any matters covered by them; the processes and procedures for enforcing and complying with the provisions of the Mining Act.

84. Section 44 (3) of the 1999 constitution provides that “Notwithstanding the foregoing provisions of this section, the entire property in and control of all minerals, mineral oils and natural gas in under or upon the territorial waters and the Exclusive Economic Zone of Nigeria shall vest in the Government of the Federation and shall be managed in such manner as may be prescribed by the National Assembly”.

85. Furthermore, the Constitution which is the grundnorm segmented mining in the Exclusive Legislative List of the Constitution; that is, only the Federal Government of Nigeria has the power and authority to regulate and collect revenues from the industry.

86. The current framework requires mining companies to obtain various licenses and permits, including exploration licenses, mining leases, and quarry leases. However, the process is often characterized by bureaucratic delays, lack of transparency, and inconsistencies, leading to challenges for investors and potential gaps in effective regulation.

87. There are sets of rules and laws enacted in Nigeria for a healthy environment through the implementation of preventive and predictive measures that forestall environmental pollution in the activities of extractive industries, in their quest to engage in economic activities by resource exploitation. As desirable as development is for humanity, it comes with its side effects some of which are environmental in the form of disruption of landscape, loss of biodiversity, pollution etc.

88. In order to reduce the impact of these developmental projects, environmental planning tools such as the Environmental Impact Assessment (EIA) report are introduced to provide information to decision-makers, that will help them factor environmental protection into their decision-making process "prior to approval, rejection or modification of proposed project plans or activities".

89. Hence, the enactment of the Environmental Impact Act (the EIA Act) as part of the governance regime that regulates extractive industry activities, is aimed at achieving sustainable development in the natural resource sector of a country's economy.

90. Additionally, the Mining Act 2007 made it an implied condition for the maintenance of a Mining Lease, that lessees shall take due precautions in matters concerning pollution and environmental degradation, including the prevention of pollution of water or watercourses in the mining area in the course of mining or prospecting for minerals. Failure to comply with these requirements amongst other consequences will require the payment of compensation to the owner or occupier of land for damage, and pollution caused to the land or to water sources.

In addition, the holder of a Mining Lease may be required by the Minister to restore any area in which mining operation has been carried out to its original position, by such methods as the replacement of the surface soil, filling of worked areas, removal of tailings, dumps and heaps caused by mining operations.

91. Also, the Minister shall establish an Environmental Protection and Rehabilitation Fund, to guarantee the environmental obligations of Holders of Mineral titles as provided under the Mining Act. The trustees appointed by the Minister shall operate the fund in accordance with the provisions of the Trustees Investment Act or amendments thereof.

92. More so, the Mining Act prohibits pollution of watercourse, alterations in water supply and provides that everyone who uses water in connection with mining operations, shall ensure that the water in use does not contain injurious substances in quantities likely to prove detrimental to animal or vegetable life. Also, no person shall, in the course of Exploration or mining, carry out operations, in or under any area held to be sacred or permit injury or destruction of any tree or other thing which is the object of veneration.

Identifying Gaps in the Nigerian Mining Sector

93. The Nigerian mining sector has undergone several reforms in recent years to attract investment and promote sustainable development.

However, challenges persist, and it is essential to identify the gaps in the legal and regulatory framework governing the mining industry. We shall highlight areas that require improvement to enhance the sector's effectiveness and competitiveness.

94. One of such is simplifying and streamlining the licensing and permitting processes which will in turn reduce bureaucratic bottlenecks and enhance the ease of doing business in the mining sector.

95. The legal framework contains provisions for environmental protection, including the requirement for EIAs and the establishment of the Environmental Protection and Rehabilitation Fund. However, there is a need for stricter enforcement of environmental regulations, particularly in mitigating the environmental impacts of mining activities and ensuring environmental rehabilitation and restoration.

96. Strengthening the enforcement of existing environmental regulations and introducing new regulations, including robust monitoring and compliance mechanisms, will mitigate the environmental impacts of mining activities and ensure sustainable development.

97. Further, developing clear guidelines and regulations for community engagement, including mechanisms for revenue sharing and community development agreements, will promote greater community participation and ensure equitable benefits for affected communities.

98. Additionally, establishing specific measures, such as local content quotas, technology transfer requirements, and incentives for value-added activities, will promote local participation and maximize the retention of economic benefits within Nigeria.

Canada as a case study: Policies Enacted in Canada's Mining Sector that Boosted Economic Growth.

99. Canada's mining sector has been a significant contributor to the country's economic growth and contributes nearly 5% of the country's GDP. The contribution of the mining sector is essential in many territories and in particular for local communities. It is estimated that proportionally, the industry is the largest private sector employer of indigenous people.

100. Several policies enacted at the federal level have played a crucial role in boosting economic growth in the mining sector. On the 15th of December 2022, Bill C-32 providing for the non-refundable "30% Critical Mineral Exploration Tax Credit" (30% CMETC) proposed by the Government of Canada in the 2022 budget received Royal Assent.

CMETC allows investors in flow-through shares to claim a tax credit for eligible exploration expenses. This incentive encourages investment in exploration projects, stimulates mineral discoveries, and attracts capital to the mining sector, leading to economic growth and job creation.

101. The federal government has implemented initiatives to support economic development in Canada's northern regions, which are rich in mineral resources. Programs such as the Strategic Investments in Northern Economic Development (SINED) aim to invest in critical infrastructure, research and development, and capacity-building projects in the mining sector. These investments promote mining activity, create employment opportunities, and foster economic growth in northern communities.

102. The Canadian government has implemented measures to improve regulatory efficiency and streamline processes in the mining sector. This includes reducing duplicative regulatory requirements, harmonizing environmental assessments, and enhancing coordination among federal, provincial, and territorial regulatory bodies. Streamlining regulations reduces delays and administrative burdens for mining companies thereby enabling more efficient project development and contributing to economic growth.

103. Further, Canada places significant importance on engaging indigenous communities in the mining sector. The government has enacted policies that promote meaningful consultation, collaboration, and partnership agreements with indigenous groups. These initiatives ensure that indigenous communities have a voice in mining projects, share in economic benefits, and participate in employment and business opportunities. Indigenous engagement fosters positive relationships, reduces conflicts, and contributes to sustainable economic growth in mining regions.

104. The Canadian government provides funding for research and innovation in the mining sector. Initiatives such as the Strategic Innovation Fund and the Natural Resources Canada's Clean Growth Program to support research and development, technological advancements, and the adoption of sustainable practices in mining. This funding encourages innovation, improves productivity, and enhances competitiveness.

105. The Canadian government actively promotes trade and investment in the mining sector. It engages in international trade agreements, supports trade missions and delegations, and provides export assistance to mining companies.

These efforts attract foreign investment, open new markets, and expand opportunities for Canadian mining products and services, contributing to economic growth and job creation.

106. Canada has also implemented robust environmental regulations and sustainability standards for the mining sector. These regulations promote responsible mining practices, environmental protection, and the reclamation of mine sites. By ensuring sustainable and environmentally sound mining operations, Canada maintains its reputation as a global leader in responsible resource development, enhancing investor confidence and contributing to long-term economic growth.

107. These policies, among others, have played a significant role in fostering economic growth in Canada's mining sector. Their implementation demonstrates the government's commitment to supporting a sustainable and prosperous mining industry, generating employment, and driving economic development in mining regions across the country.

United States of America (USA) as a case study: Policies Enacted in USA's Mining Sector that Boosted Economic Growth.

108. The USA has a diverse and significant mining sector that contributes to the country's economic growth. Various policies and initiatives have been enacted to support and promote the mining industry.

109. The US government has implemented policies to streamline permitting processes for mining projects. These efforts aim to reduce regulatory burdens and expedite the approval of mining permits, thereby facilitating timely project development, and attracting investment. In September 2022, Congressman Pete Stauba, a ranking member of the Energy and Mineral Resources Subcommittee, introduced the Permitting for Mining Needs Bill, which creates certainty for the mining community, limits frivolous litigation, and requires agency coordination across the Federal government. Streamlined permitting processes contribute to economic growth by reducing project delays and increasing investor confidence.

110. The US government has pursued policies to promote domestic energy production and resource development, including in the mining sector.

This includes initiatives to expand access to federal lands for mining activities, encourage responsible extraction of minerals and energy resources, and support technological advancements in resource extraction. The US implemented a Critical Minerals Strategy to ensure a reliable and secure supply of critical minerals, which are essential for various industries, including technology, defense, and renewable energy. This strategy involves identifying and developing domestic sources of critical minerals, reducing reliance on imports, and supporting the responsible extraction and processing of these minerals.

111. In addition, laws such as the Infrastructure Investment and Jobs Act, 2021 in the US focus on improving transportation networks, including roads, bridges, and ports. Upgraded infrastructure enhances access to mining areas, reduces transportation costs, and increases the efficiency of mineral exports, thereby supporting economic growth in the mining sector.

112. As part of its initiatives to promote research and development (R&D) in the mining sector, programs such as the Advanced Manufacturing Office and the Critical Materials Institute were established by the US government to support R&D efforts to improve mining technologies, develop innovative extraction methods, and enhance environmental sustainability. Funding for mining-related R&D fosters technological advancements, increases productivity, and promotes economic growth through enhanced competitiveness.

113. From the perspective of workforce development and training programs in the mining sector, the US government introduced initiatives such as the Workforce Innovation and Opportunity Act aim to enhance skills development, promote job training, and provide resources for retraining and reskilling workers. These programs help meet the industry's evolving needs, address labour shortages, and support economic growth by ensuring a skilled and qualified workforce.

114. Although the regulatory landscape of the Nigerian mining sector appears to be a developing one, there are existing regulations governing the sector but there has not been a clear and smooth implementation of those regulations. For instance, the EIA Act provides that entities must consider in advance the environmental effects of any public or private projects and are required to make an environmental impact assessment, especially where the extent, nature or location of a proposed project or activity is such that is likely to significantly affect the environment (mining activities inclusive).

Where a person fails to comply with these provisions, he commits an offence and is liable on conviction to a fine or to a term of imprisonment of up to five years. However, there are only a few instances of the effective implementation of this provision. It could also be said that the EIA Act aids non-compliance because an offending individual is liable to a fine of NGN 10,000 (Ten Thousand Naira) and Firms and corporations can be fined between NGN 50,000 (Fifty Thousand Naira) and NGN1,000,000 (One Million Naira). These penalties are too low to compel compliance and they are hardly ever imposed on offenders. Therefore, the government needs to devise and adopt means of enforcing the provisions of the law with stern implementation of the applicable penalties.

115. On the other hand, the legal framework regulating the mining sector can be regarded as inadequate, considering the regulatory gaps in the sector. A good example is the challenge of exploitation of mineral resources and legal assistance to artisanal and small-scale miners with regard to the formalization of their mining operations. These people are not well-informed or are far removed from the capacities and facilities that are needed for registration of their businesses. Although, legal and structural frameworks for assistance to artisanal and small-scale miners already exist as provided in the Mining Act, however, there is a need to bring the bureaucracy and formal institutions closer to the grassroots to capture unregistered and unregulated activities. From the foregoing, Nigeria can take a cue from these forward-looking policies from the case studies and consider its local challenges in order to improve the value of its mining sector which will in turn trigger economic growth and employment opportunities.

116. Notably, a new bill to replace the Nigerian Minerals and Mining Act is currently before the National Assembly. The proposed Act is geared towards bringing the provisions in line with modern realities and boosting private investment in the mining sector. The legislative process is an opportunity for the central legislature to consider some of the identified regulatory gaps in the mining sector.

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PART SIX

DOES THE MINING SECTOR HAVE A STRONG DECOMMISSIONING AND ABANDONMENT FRAMEWORK? HOW CAN THAT BE STRENGTHENED?

The Concept of Decommissioning and Abandonment and its Impact on the Environment

117. Decommissioning and abandonment are interrelated concepts which are typically treated together, and they relate to the cessation of operations and the permanent closure of industrial facilities. Such as oil and gas fields. They also come into play during the final stage of energy projects.

118. Decommissioning relates to the physical removal and disposal of obsolete installations at the end of their working life. Abandonment, on the other hand, refers to the act of stopping an activity with no intention of returning to it. Abandonment is typically carried out once all decommissioning activities have been completed.

119. Decommissioning and abandonment can result in significant and long-lasting negative environmental consequences, impacting not only the present but also future generations. It is adjudged to be critical to the safety and sustainable management of the environment, which consists of land, water, air, man, animals and plant life or flora and fauna. Hence, proper management of decommissioning and abandonment is crucial to avoid causing environmental damage. It should be noted that site decommissioning involves but is not limited to engineering and safety practices.

120. After the life of an asset, the facilities need to be recycled, relocated or safely put away to an environmentally acceptable place through an acceptable means in line with best industry practices. The selected decommissioning option should minimize harmful impacts on the environment and risks to public health. It should also take into consideration, the safety of workers and the public as well as ensure compliance with all environmental laws and regulations.⁶⁷

Overview of the Decommissioning and Abandonment Regime in the Mining Sector

121. Nigeria does not have a robust decommissioning and abandonment regime in place for the mining sector, unlike the oil and gas industry which has the Upstream Decommissioning and Abandonment Regulation and the Midstream and Downstream Decommissioning and Abandonment Regulations. There are, however, provisions on decommissioning, abandonment, and mine closure in the following statutes:

The Nigerian Minerals and Mining Act 2007

122. The Minerals and Mining Act (the Mining Act) contains certain provisions on abandonment but none on decommissioning. Section 159 of the Mining Act provides for abandonment or permanent cesser of production and it essentially provides that a holder of a mining lease, small scale mining lease and quarry lease intending to abandon or permanently cease production from the lease area shall provide a written notice to the relevant departments three months before such intended abandonment or cessation of production and also give a copy of such notice to the Mining Cadastre Office. The notification shall be accompanied by a report outlining details of the intended abandonment and the reasons thereof, together with a plan showing the workings of the mine up to the time of the notice.

123. Upon receipt of the notice, the relevant department shall make appropriate recommendations to the Minister with regard to the abandonment plan. The Minister upon receipt of the recommendation is required to within ten days, cause the matter to be investigated to determine the circumstance leading to the plan for the cessation or abandonment of production to advise the mineral title holder appropriately. After investigation of the abandonment or permanent cessation of production, the Mining Cadastre Office shall take note of the abandonment.

124. In case of abandonment or permanent cessation of production within the title area, the mineral title holder shall be required to securely seal, fence or cover every mine shaft, make safe all tailings and water retention areas; and demolish, fence or lock potentially hazardous buildings, structures, plants and equipment.

125. The Mining Act also provides environmental obligations for holders of a mineral title. Section 118 of the Mining Act requires such holders as far as it is reasonably practicable to: (a) minimize, manage and mitigate any environmental impact resulting from activities carried out under the Mining Act; and (b) rehabilitate and reclaim where applicable, the land disturbed, excavated, explored, mined or covered with tailings arising from mining operations to its natural or predetermined state or to such state as may be specified in the Mining Act, its regulations and other pertinent laws in force, and in accordance with established best practices.

126. The above provision is quite similar to the decommissioning and abandonment regime provided by the Petroleum Industry Act 2021. The Mining Act makes it mandatory for installations and structures on the land to be completely removed and also states that the environment must be restored to its original condition, except for buried transportation pipelines and gathering lines.

127. The Mining Act also contains some provisions relating to mine closure. Mine closure can be defined as the period of time when the operational stage of a mine is ending or has ended, and the final decommissioning and mine rehabilitation is being undertaken. Mine completion is the goal of mine closure. A completed mine has reached a state where mining lease ownership can be relinquished and responsibility accepted by the next land user. If mine closure and completion are not undertaken in a planned and effective manner, a site may continue to be hazardous and a source of pollution for many years to come.

128. Section 18 of the Mining Act makes mention of mine closure stating that the Mines Environmental Compliance Department (MECD) shall in addition to any other function prescribed by the Mining Act and subject to the direction of the Minister, liaise with relevant agencies of Government with respect to the social and environment issues involved in mining operations, mine closure and reclamation of land. Mine closure is more extensively dealt with in the *Nigerian Minerals and Mining Regulations 2011* ("Mining Regulations") below. Furthermore, Section 30 of the Mining Act provides that a tax- deductible reserve for mine closure costs among other things, shall be established by companies engaged in the exploitation of mineral resources.

The Mining Regulations

129. The Regulations replicate the provisions of the Mining Act on abandonment or permanent cesser of production and go ahead to define the requirements to be met and the procedure to follow in case of abandonment, permanent cessation, or suspension of production by a titleholder. The Regulations also contain further provisions on abandonment and mine closure.

130. Regulation 225 states that a mineral title holder who intends to close or abandon a mineral title area shall apply in writing not less than three (3) months before the intended closure or abandonment to the MECD for a partial or complete closure or abandonment of such are and send copies to the Mines Inspectorate and Mining Cadastral Office.

The application shall include an independent audit report on the environment surrounding the mine site. The applicant shall ensure that all conditions specified in the Environmental Impact Assessment Statement and the Environmental Protection and Rehabilitation Plan of the Mining Act and these regulations are strictly adhered to.

131. Mineral title holders shall: (a) have provisions for addressing the potential social issues and benefits associated with environmental quality and potential future land use alternatives for the site; (b) establish risk analysis methods in the closure plan development and to address design criteria for disasters and other emergency situations such as earthquake, flooding or drought; and (c) provide a clearly identified sequence and schedule of closure activities.

132. The MECD is required to issue a closure certificate for any mine closed and the mining right or permit or part of it shall be cancelled by the Minister.

133. Unlike the Mining Act, the Regulations make mention of decommissioning alongside mine closure in Regulation 160. This essentially provides that in order to commence any development or extraction of mineral resources on the lease area, mineral title holders are to submit an Environmental Impact Assessment Report to the MECD which shall contain a brief description of the project or the process which should include mine closure and decommissioning amongst other things. The Regulations also provide for a decommissioned dump defined in Regulation 2 as a dump where dumping operations have ceased but the dump has not been closed.

134. Given the potential harm that decommissioning and abandonment could cause to the environment, an EIA is required of a holder of a mining lease both under the Mining Act and the Mining Regulations. The EIA shall be carried out by experienced and qualified multi-disciplinary personnel and must be done in accordance with the provisions of the EIA Act and the Environmental Impact Assessment Sectoral Guidelines (the Guidelines) for the mining of solid minerals.

The Environmental Impact Assessment Guideline for Decommissioning

135. The Federal Ministry of Environment, being the apex environmental regulatory authority developed this guideline to guide facility owners on the appropriate processes to follow for the successful decommissioning of a facility and rehabilitation of the surrounding environment.

136. The objectives of the Guidelines are to: (i) Ensure that proper closure and decommissioning principles and processes are followed; (ii) Develop a comprehensive framework for assessing the applicability of decommissioning and reclamation plans; (iii) Render assistance to industries in planning and implementing safe and environmentally friendly decommissioning procedures/plans; and (iv) Establish safety requirements for all aspects of decommissioning, from the siting and design, of a facility to the termination of the authorization for decommissioning.

137. Paragraph 4 lists the basic requirements for decommissioning and they are as follows:

137.1 Removal of structures on or beneath the ground;

137.2 Disposal or secure isolation and/or treatment of contaminated equipment in-situ or offsite;

137.3 Remediation of aesthetics (backfillings, stained soil removal, waste disposals, etc.) and containment control of contaminant and general site clean-up;

137.4 Access controls for physical structures remaining on-site that are unsafe or hazardous to humans or animals;

137.5 Remediation of aesthetically unacceptable portions of the site (filling of pits, removal of stained soil and odorous material, levelling of mounds, disposal of waste rock);

137.6 Clean-up of the site to a level which will provide long-term environmental protection and will be safe for the intended future use;

137.7 Registration on title to the property of any contaminants, wastes or structures left on site that restricts future land use or that require periodic monitoring to ensure continued integrity; and

137.8 Submission to the applicable regulatory agency and other required jurisdictions of a report confirming that decommissioning and clean-up have been completed.

Review of Decommissioning and Abandonment Frameworks in the Mining Sector: Canada as a Case Study

138. Mine closure, decommissioning, abandonment and reclamation are critical aspects of responsible mining practices in Canada. This part provides an overview of the key regulations, guidelines, and initiatives governing mine closure and reclamation in the country.

139. Canada has a robust regulatory framework in place to ensure effective mine closure and reclamation. Several key regulations are instrumental in this process. The Metal and Diamond Mining Effluent Regulations under the Fisheries Act require mine operators to report any stoppage of commercial operations of the mine. The Canadian Environmental Protection Act administered by Environment and Climate Change Canada (ECCC), establishes guidelines and standards for the treatment, storage, and release of deleterious elements, substances considered toxic if released into the environment in certain quantities and under certain conditions. These standards are incorporated in the terms and conditions of licences, permits, and other project approvals from regulators. The Uranium Mines and Mills Regulations administered by the Canadian Nuclear Safety Commission, govern the suspension, cessation, and decommissioning of uranium or thorium mines and require such operators to obtain a licence for these activities.

140. Additionally, the Territorial Lands Regulations (TLR) under Federal Land Use Regulations emphasize the importance of surface reclamation and stability. Workers' Safety and Compensation Commission (WSCC) inspectors may require all mine openings to be filled, fenced, kept stable or otherwise made safe on temporary closure or final abandonment of works. This is to secure public safety and to prevent any deposit of waste through ongoing seepage.

141. Within the Canadian federal system, the provinces and territories have jurisdiction over mining matters and have adopted requirements with respect to mine reclamation and closure, these are generally administered by provincial or territorial ministries responsible for mines or natural resources. In British Columbia, specific legislations govern the mine closure process, such as the Mines Act of 1989, the Environmental Assessment Act of 1995, and the Contaminated Site Regulation of 2011. In addition to legislative measures addressing mine closures, each province in Canada provides guidelines that offer detailed provisions for mine closure. For instance, Manitoba has established the General Closure Plan Guidelines (2006) as a resource for mine closure procedures (Industry, Trade & Mines 2006).

142. There are some key features of the mine closure process in Canada one of which is mine closure planning. In the past, mines were abandoned because there were no regulations holding mine owners accountable for the entire lifecycle of a mine.

This lack of accountability resulted in physical and environmental hazards when companies simply abandoned their sites. Presently, Canadian mining legislation requires mine developers to submit mine closure plans that outline the progressive rehabilitation and eventual decommissioning of the site once mining activities end.

143. Mine owners and operators are required by law to develop and maintain mine closure plans which are initiated during the design phase of a mine and are regularly updated throughout its lifecycle usually after every three to five years. The mine closure plan is submitted alongside an application for mining development as well as Environmental Impact Assessment and Social Impact Assessment reports. A federal environmental assessment is required for the decommissioning and abandonment of projects that meet the designated project thresholds under the Canadian Environmental Assessment Act (CEAA) 2012. The closure plan is reviewed and approved by the relevant government agency. Approval of mine closure plans to rehabilitate and restore properties after the completion of mining operations is provided for in the mining legislation of most Canadian jurisdictions. The closure plan encompasses a range of considerations, including post-closure activities and site conditions, ensuring that closure and reclamation efforts are well-documented and effectively implemented.

144. In Canada, the reclamation of land and decommissioning are also crucial components of mine closure. As part of the mine closure plan, an impact management plan is prepared, which encompasses the reclamation of land, re-vegetation, and remediation of other environmental impacts. It also includes efforts to rehabilitate affected communities and employees on social and economic levels. A monitoring program is established to track the progress of implementation activities and assess the accuracy of predicted impacts.

145. Relinquishment is yet another key feature of the mine closure process. An application for relinquishment is required to be submitted by mine owners and operators upon the implementation of closure activities. Site assessment is required in this regard as part of the acceptance procedure. Land used for mining activities is returned to the Crown after mine closure takes place, under the authority of an Act.

146. Financial assurance for mine closure is also an essential part of Canada's mine closure process. All of the ten Canadian provinces, Northwest Territory (NWT) and the Yukon have in place legislations that require mining companies to specifically set aside funds to be used for reclamation following mine closure.

Companies are required to secure the necessary funding by providing guarantees for mine closure funds prior to mine construction and operation. To ensure that mine closure and reclamation activities are adequately funded, companies are required to provide financial assurance prior to the construction and operation of a mine. The forms of financial funds include bonds, insurance, and trust funds among others. The calculation of financial cost is undertaken by the proponents and tools for calculation may vary across the jurisdictions.

147. The mining industry in Canada is committed to continuous improvement and innovation in mine closure and reclamation practices. This includes the adoption of new technologies and techniques to enhance the effectiveness and efficiency of closure plans. Ongoing research and innovation are crucial for addressing potential risks and challenges associated with mine closure, as well as for developing advanced monitoring technologies and remediation approaches.

148. The National Orphaned and Abandoned Mines Initiative (NOAMI) was established in 2002 by the Federal, Provincial, and Territorial Mines Ministers, following a multi-stakeholder workshop in 2001 to address the problems brought on by orphaned or abandoned mines which include environmental, health, safety, and economic issues for communities, the mining industry, and governments. NOAMI focuses on addressing neglected mineral sites that have no responsible owner, commonly referred to as abandoned or orphaned mineral sites. Over the past two decades, significant progress has been made in Canada to clean up these sites and establish policies to ensure that new and existing mining operations have proper reclamation and closure plans in place.

149. NOAMI has several task groups working on different aspects related to abandoned mines. The information gathering/inventory task group aims to develop a national inventory of these sites by combining inventories from each province and territory into a web-based interactive platform. The Community involvement task group focuses on fostering community participation in decision-making regarding closure and reclamation standards. The legislative and institutional barriers and collaboration task group examines the legal and institutional obstacles to collaboration in clean-up activities, while the funding approaches task group identify funding options for mine remediation. Finally, the Jurisdictional legislative reviews task group assesses the legislative, regulatory, and policy frameworks related to collaboration, liability, and funding in each jurisdiction.

150. Recommendations derived from these initiatives include the need for legislation and regulations mandating mine closure plans for the entire mining lifecycle, the establishment of financial assurance regimes, improvement in estimating costs and increasing financing options, the inclusion of major mineral exploration activities in closure plans, implementation of baseline data collection and testing for environmental contaminants, and the development of inspection and enforcement programs.

151. Overall, Canada has made significant strides in addressing orphaned and abandoned mines, implementing policies to ensure responsible mining practices, and involving various stakeholders in the decision-making process. However, ongoing efforts are needed to improve closure planning, financial security, collaboration, and long-term management of these sites.

152. Also worthy of mention is the Towards Sustainable Mining (TSM) Mine Closure Framework, a guiding principle of the Mining Association of Canada (MAC). This Framework outlines the commitments of MAC members regarding mine closure planning and implementation. The key commitments include:

152.1 Development and Maintenance of Mine Closure Plans: MAC members commit to developing and maintaining comprehensive mine closure plans, including post-closure activities, for both new and existing projects.

152.2 Consultation and Reclamation Objectives: MAC members are to engage in consultation with Communities Of Interest (COI) to identify their values and incorporate them into reclamation objectives. They evaluate various potential end land uses that address the needs of users, striving to restore mine sites to viable and diverse ecosystems that serve post-mining purposes.

152.3 Socio-Economic Impact Mitigation: MAC members collaborate with communities to develop closure plans and strategies to mitigate the socio-economic impacts of mine closure. This includes assisting communities in long-term economic development planning beyond mining.

152.4 Financial Assurance: MAC members establish financial assurance for closure in compliance with applicable laws. In the absence of such laws, financial assurance may be provided through bonds, letters of credit, self-insurance, self-guarantee, or other financial instruments.

152.5 Continual Improvement and Innovation: MAC members commit to continual improvement of their closure plans through regular reviews and updates. They consider new technologies and closure techniques to enhance the effectiveness and efficiency of closure activities.

152.6 Research, Innovation, and Risk Assessment: MAC members foster a culture of research and innovation, driven by identified risks, to improve closure and monitoring technologies. They prioritize identifying and addressing potential risks associated with closure and reclamation.

152.7 Monitoring Programs: Monitoring programs are implemented during progressive reclamation, closure, and post-closure phases, aligned with the objectives of the closure plan. These programs assess human health and ecological risks, providing comprehensive information on the progress and success of reclamation efforts.

By adhering to these commitments, MAC members aim to ensure responsible and sustainable mine closure, incorporating environmental, social, and economic considerations.

153. Conclusively, mine closure and reclamation in Canada are guided by a comprehensive regulatory framework that emphasizes responsible mining practices and environmental protection. Through community engagement, financial assurance, and ongoing innovation, the mining industry is committed to ensuring the effective closure and reclamation of mining sites. By adhering to these practices, Canada demonstrates its commitment to sustainable mining operations and the preservation of the environment.

A Comparative Analysis of the Decommissioning and Abandonment Framework of the Mining Sectors of Canada and Nigeria

154. There are some similarities between the legal framework of both jurisdictions such as the existence of laws regulating mine closure, decommissioning and abandonment, and the emphasis on the importance of responsible mining practices and environmental protection. However, there are some key differences, and they are discussed as follows:

154.1 Decentralisation: In Canada, the regulatory framework for mine closure and reclamation is primarily administered at the provincial or territorial level, with ministries responsible for mines or natural resources overseeing the process. In Nigeria, the federal government through the Ministry of Mines and Steel Development, has more centralized control over mining operations, including closure and reclamation.

154.2 Legal Framework: Canada has a robust regulatory framework in place, with specific regulations and acts governing mine closure and reclamation, such as the Metal and Diamond Mining Effluent Regulations, Canadian Environmental Protection Act, and Uranium Mines and Mills Regulations. In contrast, Nigeria has fewer specific Regulations and Acts dedicated to mine closure and reclamation, which can impact the enforcement and accountability of responsible mining practices.

154.3 Technology and Innovation: Canada's mining industry is committed to continuous improvement and innovation in mine closure and reclamation practices. Ongoing research and development of new technologies and techniques are prioritized to enhance the effectiveness and efficiency of closure plans. Nigeria may have a less advanced adoption of innovative technologies in the mine closure and reclamation process.

154.4 Mine Closure Planning: Canada emphasizes the requirement for mine developers to submit comprehensive mine closure plans, outlining progressive rehabilitation and decommissioning. Nigeria's framework does not explicitly mention this aspect.

154.5 TSM Mine Closure Framework: Canada's MAC has the TSM Mine Closure Framework, outlining commitments for mine closure planning and implementation. The Miners Association of Nigeria does not have a similar framework.

154.6 Financial Assurance: Canada emphasizes the importance of financial assurance for mine closure. Mining companies are required to set aside funds specifically for reclamation following mine closure, and various financial instruments like bonds, insurance, and trust funds are used to secure these funds. In Nigeria, the regulations and practices around financial assurance for mine closure may be less developed or enforced, potentially leading to challenges in adequately funding reclamation activities.

154.7 Stakeholder Engagement: Canada places significant importance on community involvement and consultation during mine closure and reclamation planning. Mining companies are encouraged to engage with communities of interest and incorporate their values into reclamation objectives. This is not the case in Nigeria.

154.8 Initiatives for Orphaned Mines: Canada has the NOAMI, to address the issues associated with orphaned or abandoned mines.

Nigeria's framework does not mention a similar national initiative specifically for orphaned or abandoned mines.

155. Based on the comparison between Canada and Nigeria in terms of mine closure and reclamation practices, the following are some recommendations to strengthen the decommissioning and abandonment framework for Nigeria's mining sector:

155.1 Strengthen Regulatory Framework: Nigeria should consider developing and implementing comprehensive Regulations and Acts specifically dedicated to mine closure and reclamation. This would provide a clear legal framework for responsible mining practices, ensuring environmental protection and accountability throughout the mining lifecycle.

155.2 Enhance Financial Assurance: Nigeria should establish regulations that require mining companies to set aside funds for mine closure and reclamation. This would ensure that sufficient financial resources are available to carry out effective reclamation activities after mining operations cease. Utilizing financial instruments like bonds, insurance, or trust funds can help secure these funds.

155.3 Promote Stakeholder Engagement: Nigeria should encourage and facilitate meaningful engagement with local communities and other stakeholders throughout the mine closure and reclamation process. This includes involving communities of interest in decision-making, incorporating their values and concerns into reclamation objectives, and fostering collaboration to mitigate socio-economic impacts and ensure long-term development beyond mining.

155.4 Embrace Technological Advancements: Nigeria should focus on adopting and promoting innovative technologies and techniques for mine closure and reclamation. Research and development efforts should be encouraged to identify and implement advanced monitoring technologies, remediation approaches, and best practices that can enhance the efficiency and effectiveness of closure plans.

155.5 Address Abandoned Mines: Nigeria should develop a comprehensive strategy to address the challenges posed by abandoned mines. This includes conducting thorough assessments and inventorying abandoned mine sites, establishing policies and mechanisms for their clean-up and reclamation, and implementing measures to prevent the creation of new abandoned mines in the future.

PART SEVEN

WHAT POLICIES AND LAWS ARE NEEDED TO STRENGTHEN THE BLUE HYDROGEN SECTOR TOWARDS THE DECARBONIZATION OF THE INDUSTRIAL SECTOR?

Brief Overview of the Blue Hydrogen Sector

156. The Federal Government of Nigeria has expressed general interest in the development of hydrogen to supplement the country's energy demand through the National Energy Policy 2018, which details a short, medium and long-term strategy towards the incorporation of hydrogen in the country.

157. Hydrogen is considered a critical fuel of the future and interest in the low-carbon alternative is gaining momentum as the world explores its potential for the industrial, power generation and transportation sectors to cut emissions and meet their global targets of carbon neutrality. Hydrogen, which is being tested as an alternative to fossil fuels in the transport sector, can help slash greenhouse gas emissions from the hydrocarbons sector by 34 per cent, according to Bloomberg NEF.

158. Globally, the hydrogen industry is expected to grow to \$183bn by 2023, from \$129bn in 2017, according to Fitch Solutions. French investment bank Natixis has estimated that investments in hydrogen will exceed \$300bn by 2030.

159. Blue hydrogen refers to hydrogen produced from natural gas or other fossil fuels using Carbon Capture and Storage (CCS) technology to mitigate greenhouse gas emissions. In the context of Nigeria, there are several potential applications for blue hydrogen due to the country's significant natural gas reserves and its commitment to reducing carbon emissions while harnessing its energy resources.

160. The blue hydrogen sector is an emerging industry focused on the production and utilization of hydrogen generated from natural gas or other fossil fuels with CCS technology. Blue hydrogen is produced through a process called Steam Methane Reforming (SMR) or Auto Thermal Reforming (ATR), where natural gas is reacted with steam or a combination of oxygen and steam to produce hydrogen and Carbon dioxide (CO₂). CO₂ is then captured, transported, and stored underground, preventing it from being released into the atmosphere.

161. The development of the blue hydrogen sector is driven by several factors. Firstly, hydrogen is considered a versatile and clean energy carrier that can be used in various sectors, including industry, transportation, and power generation, as a low-carbon alternative to fossil fuels.

Blue hydrogen offers a transitional solution by leveraging existing natural gas infrastructure while reducing carbon emissions through CCS.

162. The sector has gained attention due to its potential to contribute to global decarbonization efforts. Blue hydrogen production significantly reduces CO₂ emissions compared to traditional hydrogen production methods. It allows for the continued use of natural gas resources while capturing and storing the resulting CO₂, thereby helping to mitigate climate change.

163. The growth of the blue hydrogen sector requires substantial investments in infrastructure and technology. This includes the development of hydrogen production facilities, CCS infrastructure for CO₂ capture and storage, and the establishment of hydrogen transportation and distribution networks. These investments are essential to create a comprehensive and reliable hydrogen value chain.

164. Key stakeholders in the blue hydrogen sector include energy companies, industrial players, government entities, research institutions, and technology providers. Collaboration between these stakeholders is crucial to drive innovation, develop cost-effective technologies, and establish supportive policies and regulations.

165. Several countries and regions around the world are actively investing in the development of blue hydrogen. These efforts include pilot projects, demonstration plants, and the establishment of hydrogen hubs or clusters. Governments are implementing supportive policies, financial incentives, and regulatory frameworks to accelerate the growth of the sector and attract private investments.

166. The future of the blue hydrogen sector depends on various factors, including advancements in CCS technology, cost reduction through economies of scale, and the availability of renewable energy sources for hydrogen production. As renewable energy becomes more affordable and abundant, green hydrogen (produced through electrolysis powered by renewable energy) is also gaining traction as a long-term sustainable option alongside blue hydrogen.

167. It is noteworthy that the blue hydrogen sector in Nigeria is still in its nascent stages. While Nigeria is known for its significant natural gas reserves, which can serve as a feedstock for blue hydrogen production,

the country is yet to fully exploit the potential of this sector. However, there is growing interest and recognition of the opportunities that blue hydrogen can offer in Nigeria's energy transition.

Industrial Decarbonization and the Role of Blue Hydrogen

168. Blue hydrogen, produced from natural gas with CCS, holds great potential for various applications in Nigeria's industrial sector. It can serve as a cleaner alternative to conventional fossil fuels in the petrochemical industry. It can be used as a feedstock to produce chemicals, such as ammonia, methanol, and other hydrogen-based compounds. By utilizing blue hydrogen, the sector can reduce its carbon emissions while maintaining its industrial processes.

169. Interestingly, blue hydrogen has the potential to decarbonize the steel manufacturing process. In traditional steel production, coal and other carbon-intensive fuels are used for heating and reducing iron ore. By substituting these fuels with blue hydrogen, the carbon emissions associated with steel production can be significantly reduced.

170. Nigeria's oil refining and processing sector can benefit from the adoption of blue hydrogen. Blue hydrogen can be utilized as a low-carbon source of energy for various refining processes, such as desulfurization, hydrocracking, and hydrogenation. This substitution can lead to a reduction in greenhouse gas emissions and help the sector meet environmental targets.

171. Furthermore, blue hydrogen can contribute to cleaner power generation in Nigeria's industrial sector. It can be used in gas turbines or fuel cells to generate electricity with lower carbon emissions compared to traditional fossil fuels. This application can help industries meet their power demands while aligning with sustainability goals.

172. Moreover, it can be employed as a clean energy source for heat and steam generation in industrial processes. It can replace natural gas or coal-fired boilers, reducing the carbon footprint associated with these activities. Industries that require high-temperature processes, such as cement production and glass manufacturing, can benefit from this transition.

173. Implementing blue hydrogen in Nigeria's industrial sector would require investment in CCS infrastructure, supportive policies, and technological advancements. Collaboration between industry stakeholders, government agencies, and international partners can help accelerate the adoption of blue hydrogen and foster a more sustainable and low-carbon industrial landscape in Nigeria.

Advantages of the Utilisation of Blue Hydrogen in Nigeria's Industrial Sector

174. The utilization of blue hydrogen in Nigeria's industrial sector offers several advantages. By adopting blue hydrogen, industries in Nigeria can contribute to national and global efforts to mitigate climate change and reduce carbon footprints.

175. Nigeria has abundant natural gas reserves, which can be utilized for blue hydrogen production. By diversifying the energy mix and leveraging these resources, Nigeria can enhance its energy security by reducing dependence on traditional fossil fuels and exploring cleaner energy options for industrial processes.

176. Implementing blue hydrogen in the industrial sector can enhance Nigeria's competitiveness on a global scale. As international markets transition towards decarbonization, industries that adopt cleaner energy solutions, such as blue hydrogen, are likely to gain a competitive advantage, attract investment, and access markets that prioritize sustainable practices.

177. The adoption of blue hydrogen in the industrial sector can create employment opportunities across the value chain, from hydrogen production and infrastructure development to the manufacturing and deployment of hydrogen-based technologies. Additionally, it can attract investments and stimulate economic growth by positioning Nigeria as a player in the emerging hydrogen economy.

178. Blue hydrogen offers a pathway towards more sustainable industrial practices. By reducing carbon emissions, industries can mitigate air pollution, improve local environmental conditions, and contribute to sustainable development goals.

179. The application of blue hydrogen in Nigeria's industrial sector can drive technological advancements and foster innovation. It can stimulate research and development activities in areas such as carbon capture and storage, hydrogen production, and utilization technologies. This can lead to the growth of a skilled workforce, promote knowledge transfer, and position Nigeria as a hub for clean energy technologies.

Risks Associated with the Utilisation of Blue Hydrogen in Nigeria for Decarbonization of Industries.

180. While the application of blue hydrogen in Nigeria's industrial sector holds promise, there are several risks and challenges that need to be considered. Blue hydrogen production, particularly with CCS technology, can involve high capital costs and operational expenses.

Establishing the necessary infrastructure and implementing CCS technologies can require significant upfront investments. This financial burden may pose challenges for industries, especially small and medium-sized enterprises, hindering widespread adoption.

181. CCS technology, which is crucial for blue hydrogen production, is still evolving and is not widely commercially available or matured in Nigeria. There may be uncertainties and risks associated with the scalability, efficiency, and reliability of the technology. Dependence on emerging and evolving technologies introduces risks of technical challenges, operational issues, and potential delays in project implementation.

182. The effective and secure long-term storage of captured carbon dioxide is essential to mitigate environmental risks. Inadequate storage capacity or potential leakage from storage sites can have detrimental environmental impacts. Proper monitoring, maintenance, and regulatory oversight are necessary to prevent adverse effects on ecosystems, groundwater, and public health.

183. The development and deployment of blue hydrogen requires a supportive regulatory framework and clear policies. The absence of well-defined regulations, incentives, and market mechanisms can create uncertainty for investors and hinder the growth of the blue hydrogen industry. Stable and consistent policies are crucial to attract investments and provide a conducive environment for long-term planning and project execution.

184. Establishing a comprehensive hydrogen infrastructure, including production, storage, and distribution networks, is vital for the widespread adoption of blue hydrogen. The development of infrastructure may require significant investments and coordination among multiple stakeholders. Lack of infrastructure and supply chain challenges can impede the growth and accessibility of blue hydrogen in Nigeria.

185. Blue hydrogen faces competition from other low-carbon alternatives, such as green hydrogen (produced through renewable energy electrolysis). The relative cost-effectiveness, market demand, and evolving preferences of international buyers can impact the competitiveness and market potential of blue hydrogen. Balancing cost competitiveness and environmental sustainability is critical to ensure market viability and demand.

186. Furthermore, blue hydrogen, being derived from fossil fuels, may face scrutiny from environmental activists and communities concerned about

the long-term implications of continued fossil fuel use. Public perception and social acceptance of blue hydrogen can influence regulatory decisions, project approvals, and public support, potentially impacting the development and expansion of the industry.

187. Addressing these risks requires comprehensive risk management strategies, collaboration among stakeholders, robust regulatory frameworks, and long-term planning. Engaging relevant stakeholders, conducting thorough environmental and social impact assessments, and ensuring transparent communication can help mitigate risks and foster a sustainable and responsible deployment of blue hydrogen in Nigeria's industrial sector.

Policy Recommendations for Leveraging Blue Hydrogen in Nigeria's Energy Transition

188. To effectively leverage blue hydrogen in Nigeria's energy transition, the following policy recommendations can be considered. Nigeria needs to establish a comprehensive and well-defined hydrogen roadmap that outlines the government's vision, targets, and strategies for the integration of blue hydrogen into Nigeria's energy mix. This roadmap should provide guidance to stakeholders, set milestones, and create a supportive framework for investments and project implementation.

189. Implement policies and regulations that incentivize the production, deployment, and consumption of blue hydrogen. This includes providing financial incentives, tax breaks, grants, and subsidies to attract private sector investments in blue hydrogen infrastructure and technologies. Regulatory frameworks should also facilitate the smooth integration of blue hydrogen into the existing energy system.

190. Allocate resources for research and development activities focused on blue hydrogen technologies, including CCS, hydrogen production, storage, and distribution. Encourage collaboration between research institutions, universities, and industry to drive innovation, improve efficiency, and reduce the costs associated with blue hydrogen production.

191. Invest in the development of a robust hydrogen infrastructure, including production facilities, storage facilities, and a distribution network. Provide financial support and incentives for the establishment of CCS infrastructure to enable the capture and storage of carbon emissions. Collaborate with private sector partners to develop a comprehensive hydrogen supply chain across the country



192. Foster collaboration between the government, private sector, and international partners to accelerate the deployment of blue hydrogen projects. Facilitate public-private partnerships to share expertise, technology transfer, and financial resources. Develop frameworks that enable private sector participation in blue hydrogen projects, including power purchase agreements (PPAs) and off-take agreements.

193. Establish training programs and skill development initiatives to build a skilled workforce capable of supporting the development and operation of blue hydrogen projects. This includes training in areas such as hydrogen production, CCS technologies, hydrogen infrastructure maintenance, and safety protocols. Collaborate with educational institutions and industry stakeholders to develop curriculum and training programs.

194. Engage in international collaborations and partnerships to leverage global expertise and best practices in blue hydrogen development. Participate in international hydrogen initiatives, share knowledge, and establish strategic partnerships with countries that have advanced hydrogen economies. This can facilitate technology transfer, market access, and knowledge sharing, accelerating Nigeria's transition to a hydrogen-based economy.

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195. Launch public awareness campaigns to educate citizens about the benefits of blue hydrogen and its role in reducing carbon emissions. Engage local communities, environmental organizations, and stakeholders to ensure transparency, address concerns, and build social acceptance for blue hydrogen projects. Encourage public participation in decision-making processes related to blue hydrogen deployment. By implementing these policy recommendations, Nigeria can create an enabling environment for the successful integration of blue hydrogen into its energy transition, fostering sustainable economic growth, and reducing carbon emissions.

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PART EIGHT

THE REGULATORY GAPS IN THE MIDSTREAM AND DOWNSTREAM INFRASTRUCTURE FUND FOR GAS EXPECTED TO SUPPORT NIGERIA'S DECADE OF GAS DECLARATION

Overview of the Legal Framework for Gas in Nigeria

196. The Petroleum Industry Act, 2021 (PIA) is the main piece of legislation for the regulation of the industry. It provides the legal framework for the administration of natural gas operations in Nigeria and regulates the entire gas value chain, from licensing, exploration, production and processing to distribution of gas in Nigeria or exportation of gas from Nigeria. The PIA also establishes two principal regulators – the Nigerian Upstream Petroleum Regulatory Commission (NUPRC) which regulates commercial, technical, and operational upstream petroleum operations, and the Nigerian Midstream and Downstream Petroleum Regulatory Authority (NMDPRA, or the Authority) which regulates commercial, technical and operational activities in the midstream and downstream sector.

197. To operate within the midstream and downstream gas sector in Nigeria, an operator is required to obtain licences from the NMDPRA. Some of these licences include gas processing licence; bulk gas storage licence; gas transportation pipeline licence; gas transportation network operator licence; wholesale gas supply licence; retail gas supply licence, gas distribution licence; domestic gas aggregation licence, etc.

198. The PIA also provides for open access and third-party access rights to gas pipelines or related gas infrastructure as may be provided in a license or designated by the Authority by regulation. Third-party access requires a licensee to grant access to its facilities to other parties (including competitors) for uncommitted capacity, and open access is a non-discriminatory access for all users under conditions where the licensee does not have any preferential rights to the facilities.

199. In addition to the PIA, other regulations applicable to the Nigerian gas sector include:

199.1 Gas Pricing and Domestic Demand Regulations 2023 – this regulation categorizes the gas market into a regulated domestic market and unregulated market. It designates the power sector, gas-based industries, and the commercial sector as the strategic sectors, as well as provides the applicable pricing for each sector. It also introduces the concept of a regulated and unregulated market allowing sellers and buyers to voluntarily negotiate gas prices, especially in unregulated markets.

199.2 Midstream Gas Flare Regulations 2023 – the objectives of the Midstream Gas Flare Regulations include the reduction of the environmental impact of excessive gas flaring; the protection of the environment and the prevention of waste of natural resources. Notably, it sets the criteria for gas flaring in midstream petroleum operations for safety purposes.

199.3 Gas Trading and Settlement Regulations 2023: the Gas Trading and Settlement Regulations 2023 aims to regulate the establishment and operations of gas trading and settlement exchange platforms in order to promote and sustain efficient, robust gas trading, exchange and settlement of natural gas and other gas commodities. It does this by setting out the principles for the secure, reliable, and efficient trading and settlement of natural gas and other gas commodities.

199.4 Natural Gas Pipeline Tariff Regulations 2023: this regulation sets the framework for charging tariffs for new and existing gas transportation pipelines or a gas transportation network, operated for licensee's own account or on an open access basis. It establishes the methodology as well as structure for tariffs in open access facilities.

The Decade of Gas Declaration

200. As of 2023, Nigeria possesses an estimated 206.5 trillion cubic feet (Tcf) of proved natural gas reserves with dry natural gas production averaging about 1.5 Tcf between 2012 and 2021, while consumption averaged 649 billion cubic feet (Bcf) over the same period. On the 29th of March 2021, President Muhammadu Buhari declared 2021 – 2030 as the “Decade of Gas”. This is an ambitious initiative aimed at leveraging the country's vast gas reserves to achieve industrialisation, economic prosperity and energy sufficiency in Nigeria. The Decade of Gas Declaration

201. The Nigerian government is relying on various initiatives to drive this agenda. Worthy of mention are the following:

201.1 The recognition and adoption of the existing Nigerian Gas Transportation Network Code, under the PIA

O.M Atoyebi, 'An Overview of the Legal and Regulatory Framework of the Nigerian Gas Market' (11 October 2022) <<https://omaplex.com.ng/an-overview-of-the-legal-and-regulatory-framework-of-the-nigerian-gas-market/>> accessed 12 May 2023.

201.2 the relaunch of the Gas Flare Commercialisation Programme, in 2022 to drive the attainment of zero gas flaring and ramp-up the utilization of flared gas for household, industry, or export purposes;

201.3 the unveiling of the framework for the Implementation of Intervention Facility for the National Gas Expansion Programme (NGEP); According to industry thought leaders and from an implementation perspective, the Decade of Gas would require three sets of enablers: (x) infrastructure for gas; (y) regulatory framework for pricing and security, and lastly (z) human capacity.

Infrastructure

202. A range of projects (new and existing) which may be geared towards the achievement this gas initiative, include (x) the 614kilometre long Ajaokuta-Kaduna-Kano (AKK) pipeline; (y) the construction of the \$10 billion Nigeria Liquefied Natural Gas Train 7; (z) the Nigeria/Morocco Pipeline project; (xx) the Nigeria Liquefied Natural Gas Train 8 project; (yy) and the establishment of gas processing facilities.

203. These projects where implemented, are expected to spur the development of other critical projects like the Obiafu-Obrikom-Oben Gas pipeline designed to transport gas from the Obiafu-Obrikom gas plant in Rivers State to the Oben gas plant in Edo State (OB-OB-OB pipeline), and the Escravos Lagos Pipeline System Phase II: an expansion project for the existing Escravos Lagos pipeline system that transports gas from the western Niger Delta to Lagos State and other cities in the South-West. This \$20 billion dollar initiative is expected to increase gas demand at a compound annual growth rate of 16.6% annually up until the year 2030.

204. So far, only a fraction of projects highlighted above have seen the light of day while others encounter significant challenges and setbacks. For instance, the \$2.8 billion dollar AKK pipeline project (currently projected downwards to \$2.5 billion) has been reported to have reached 43% (forty-three percent) completion. On the other hand, gas transmission lines which ensure delivery of gas from natural gas evacuation sites to off-takers in the Nigerian domestic market remain fragmented.

Regulatory Framework

205. The enactment of the PIA and establishment of the regulatory and fiscal framework to support the growth of the gas industry are key steps towards achieving the objectives of the decade of gas.

Notably, the PIA also establishes the Midstream and Downstream Gas Infrastructure Fund, which will be discussed in more detail below. The third aspect, which relates to human capacity demands an interplay of expertise and financial investment for significant impact.

The Midstream and Downstream Gas Infrastructure Fund and Its Role in Achieving the Decade of Gas

206. The Midstream and Downstream Gas Infrastructure Fund (the Fund) was established under the PIA with the objective of government making equity investments (government or shareholder interests) in midstream and downstream infrastructure projects. This is aimed at increasing the domestic natural gas consumption in Nigeria through projects financed partly by private investment; encouragement of private investment by sharing risks through initial participation in selected high- risk projects and other equity investments that incentivize investments in midstream and downstream gas infrastructure and reducing or eliminating gas flare. The Fund is domiciled as a directorate of the NMDPRA. The Midstream and Downstream Gas Infrastructure Fund and Its Role in Achieving the Decade of Gas

207. The Fund is to be financed from a 0.5% levy on the wholesale price of petroleum products and natural gas sold in Nigeria, funds and grants from Multilateral and Bilateral Institutions and other related sources, Income interest earned on the funds held in the Fund, gas flaring penalties, donations and other accrued sums. The Fund is expected to contribute to the actualization of the decade of gas in some of the following ways:

207.1 Investment in Infrastructure: the Fund will support the development of midstream and downstream gas infrastructure, through investments in pipelines, gas processing facilities, bulk gas storage facilities, and distribution networks, thereby making gas accessible to the general public and increasing the domestic consumption of gas.

207.2 Investment in gas utilization projects: the Fund can enhance utilization of natural gas, by promoting the utilization of gas in power generation, industrial applications, transportation, and residential and commercial sectors which will help to reduce reliance on more polluting energy sources and contribute to a cleaner energy mix thereby promoting transition to a more sustainable energy future.

Most gas power plants in Nigeria are open cycle turbines.
<https://www.energyforgrowth.org/memo/should-lower-income-countries-build-open-cycle-or-combined-cycle-gas-turbines/>
<https://www.energytransition.gov.ng/oil-and-gas-2-2/>

207.3 Enhanced Gas Supply: by supporting projects that promote production and development of upstream gas reserves, the Fund can increase the availability and supply of natural gas.

207.4 Promoting economic development: the cumulative effect of the above would be increased domestic and foreign investments, job creation in the areas of construction, operation, and maintenance, as well as economic growth.

To further drive the implementation of the Fund, the NMDPRA issued the draft Midstream and Downstream Gas Infrastructure Fund Regulations dated 10 June 2022 (the Regulations). The Regulations sets out guidelines for the management and operation of the Fund. The Regulations also defines the roles and responsibilities of the relevant stakeholders involved in the administration of the Fund, specifies eligibility criteria for accessing and investing the Fund, and outlines the procedures for disbursing and monitoring the Fund, to foster transparency, accountability, and efficiency in the management of the Fund. Gaps in the Midstream and Downstream Gas Infrastructure Fund and the Way Forward

208. While the establishment of the Fund is expected to boost investments in midstream and downstream gas projects, there are a few areas where the implementation of the Fund that can be optimized even further:

208.1 Autonomy and Independence of the Fund: Under the PIA and the Regulation the Fund is a directorate within the Authority and the Authority exercises oversight powers over the Fund. The Authority is therefore able to monitor and supervise the implementation of the Fund as well as matters such as eligibility criteria of the projects in addition to the role of the transaction advisor, this raises concerns about the level of independence of the Fund.

208.2 Limitations on the Applicability of the Fund: there is a limitation on the application of the Fund to only equity investments namely shareholding or similar ownership stake in entities or infrastructure related to midstream and downstream operations, the implication being that the Fund cannot engage in debt investments and can only be used to fund government owned equity investment and not of the project as a whole. While this limits the scope of investments, on the other hand, most projects are likely to be funded with a combination of equity and debt which often ranges between a 20/80 to 40/60 split hence the Fund will provide the government with the resources to fund midstream and downstream projects but only to the extent of its own equity contribution.

209. For better optimization of the Fund, it may be necessary to expand the horizon of the Fund to allow for investment in not only government owned equity interest in the project but also in second layer equity investment. Also, the Fund will achieve greater purpose, if its scope can be expanded to allow for the funded government owned equity contribution to be used as security to borrow debt to fund the particular project or others, thereby enhancing not only equity investment but also debt investment.

210. Conclusively, the government's recognition of the poor utilization of gas in Nigeria has led to significant efforts in promoting its development. These efforts include declaring the Decade of Gas and enacting the PIA which among other things, establishes the Fund. Despite the challenges, the government's commendable actions in establishing the fund demonstrate their commitment to advancing the gas sector.

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Ibid

Regulation 1 of the Gas Trading and Settlement Regulations 2023

Ibid.

<https://www.eia.gov/international/analysis/country/NGA>

PART NINE

HOW DOES THE CLIMATE CHANGE ACT ALIGN WITH NIGERIA'S ETP TOWARD THE OBJECTIVE OF ACHIEVING NET ZERO BY 2060?

Overview of the Climate Change Act (CCA) and its Potential to Achieve the Core Objectives of the ETP.

211. Following the Conference of the Parties 26 (COP26) the Climate Change Act (the CCA) was passed into law on 18th November 2021 and the ETP was subsequently unveiled. The ETP was launched in August 2022 as a commitment to achieving carbon neutrality, energy poverty eradication and economic development.

212. The provisions of the CCA align with the ETP towards the objective of achieving Net Zero by 2060. The CCA provides a framework for achieving low greenhouse emissions, inclusive growth and sustainable economic development and is applicable to the Ministries, Departments and Agencies of the FGn, and to public and private entities within the territorial boundaries of Nigeria for the development and implementation of mechanisms geared towards fostering low carbon emission, a sustainable environment and a climate resilient society.

213. The CCA established a National Council on Climate Change (the Council) which will coordinate the implementation of sectoral targets and guidelines for the regulation of greenhouse gas emissions and other anthropogenic causes of climate change. The CCA also establishes a Secretariat, the administrative, scientific and technical arm of the Council which will prepare and serve on Ministries, Departments and Agencies (MDAs), and private and public entities, guidelines necessary for the actualization of climate change targets. The Secretariat has the power to visit the premises of MDAs, and private and public entities for the purposes of monitoring, verifying and reporting emission profiles or the collection of any other data necessary to undertake the functions prescribed in the Act. This provision encourages governmental and corporate compliance with actions that keep the environment safe, which is also the goal of the ETP.

214. Furthermore, Section 19 and 20 of the CCA provides for a carbon budget. The Federal Ministry of Environment in consultation with the Federal Ministry of National Planning is to set a carbon budget for Nigeria, to keep the average increase in global temperature within 2°C and pursue efforts to limit the temperature increase to 1.5°C above pre-industrial levels.

The Secretariat, in consultation with the Federal Ministries responsible for National Climate Environment, and Budget and National Planning, respectively is to formulate an Action Plan every five-year cycle, which will serve as a basis for identifying the activities aimed at ensuring that the national emissions profile is consistent with the carbon budget goals and prescribes measures and mechanisms for (i) setting out actions for mainstreaming climate change responses into sector functions (ii) identifying actions and mitigation against climate change and one of the components of the Action Plan includes proposed incentives for private and public entities, which achieve Greenhouse Gas emission reduction.

215. The CCA also imposes obligations relating to climate change on MDAs, public and private entities geared towards reduction of greenhouse gas emission. Some of the provisions include (i) MDAs to establish a climate change desk to be supervised by an officer not below a Directorate cadre, who shall be responsible for ensuring integration of climate change activities into their core mandate (ii) adherence to the annual carbon emission reduction targets BY MDAs (iii) the Council may by regulations impose obligations relating to climate change on any public entity (iv) private entities with employees numbering 50 and above must put in place measures to achieve the annual carbon emission reduction target, designate a climate change officer or an environmental sustainability officer, who will submit to the Secretariat annual reports on the entity's efforts at meeting its carbon emission reduction and climate adaptation plan. Where a private entity fails to meet its target, it will be liable to a fine to be determined by the Council. The foregoing provisions, where implemented, have a great potential to reduce greenhouse gas emissions, which avoids disastrous climate change and leads to a cleaner environment. In order to comply, these organizations will be compelled to adapt cleaner alternative energy sources in order to reduce their carbon emissions, thereby aligning with the key objectives of the ETP.

216. From the various provisions of the CCA, it goes without saying that the CCA is the oil that lubricates the engine of the ETP in Nigeria. The ETP is centered around reducing energy-related greenhouse gas emissions through various forms of decarbonization; the Act presents the main statutory framework for Nigeria's energy transition trajectory



as it prescribes sectoral and cross-sectoral strategic actions for the management of climate change activities within the country and seeks to provide a plan for achieving low GHG emissions, inclusive of green growth, and sustainable economic development.

Challenges with the implementation of the CCA and its Impact on the ETP Objectives.

217. Since the CCA came into force in November 2021, there have been positive comments on its potential to tackle the climate change problem in Nigeria. However, certain fundamental challenges in relation to the implementation of the Act have been identified and a review of the Act is being considered by the Federal Government of Nigeria based on these challenges.


218. Prior to the enactment of the Act and the consequential establishment of the Council, the Department of Climate Change under the Ministry of Environment (the Department) was in charge of climate change on a national and international scale. One of the challenges with the implementation of the Act is the absence of transitional provisions in relation to the functions of the Council and the Department. This challenge creates a duplicity of regulators on climate change which may clog the administrative wheel and affect the implementation of the CCA. Where the implementation of the CCA is impracticable, the CCA cannot effectively foster Nigeria's ETP. It is recommended that the Department be either dissolved or subsumed in the Council for clarity and efficiency.

219. The implementation of the CCA has also been challenged by the significant bureaucracy in the CCA which manifests in the establishment of state and zonal offices. Section 11 of the CCA empowers the Council to appoint (i) six zonal coordinators from the six geopolitical zones of Nigeria (ii) State Directors for each for each state of the Federal Republic of Nigeria and (iii) such other persons, as may be required to pursue the objectives of the Act. The zonal and state arrangement increases operational cost of the Secretariat and causes bureaucracy in the implementation of the Act.

220. Other challenges with the implementation of Act include paucity of experts in climate change to occupy the relevant offices in the Council and inevitable delay in setting up the action plan contemplated in the CCA as the management of the Council is in the hands of top government officials who are already saddled with enormous responsibilities in other equally important sectors of the economy and governance of the Country.

221. These challenges highlighted above, if not effectively managed, may have a significant negative impact on the attainment of ETP's objectives, given how important the implementation of the CCA is to the success of the ETP.



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