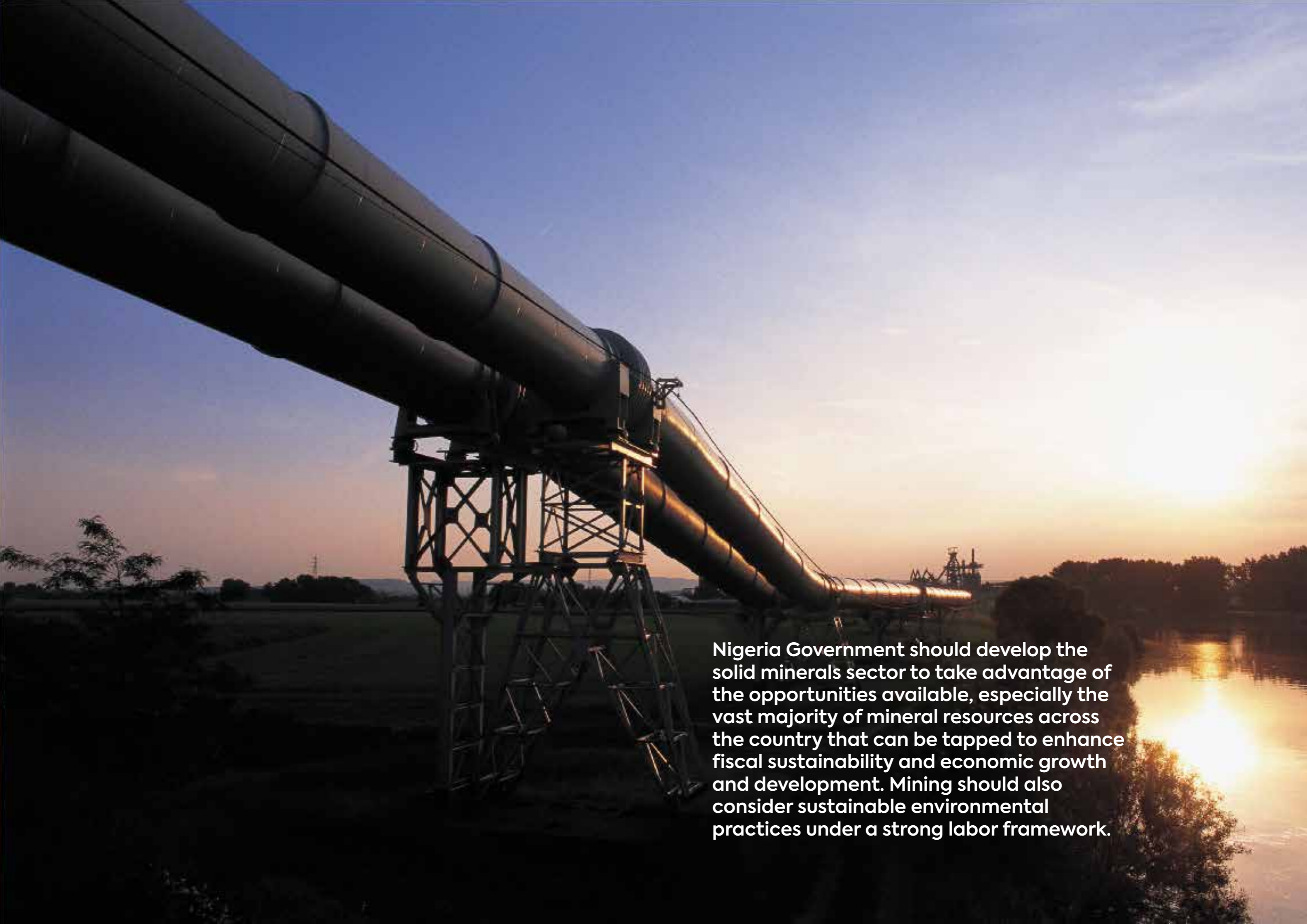


Energy Transition

Realities & Pathways
for Nigeria



Nigeria Government should develop the solid minerals sector to take advantage of the opportunities available, especially the vast majority of mineral resources across the country that can be tapped to enhance fiscal sustainability and economic growth and development. Mining should also consider sustainable environmental practices under a strong labor framework.

About BudgIT

BudgIT is a civic organisation that uses creative technology to simplify public information, stimulating a community of active citizens and enabling their right to demand accountability, institutional reforms, efficient service delivery and an equitable society.

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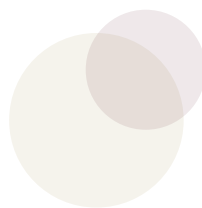
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1.0

Introduction





50%

According to the country's National Bureau of Statistics, with a median age of 18 years, 50% of Nigeria's population is very young, while over 60% is within the active and productive age bracket of 15 to 65 years.

Energy transition (ET) is the migration of energy production and consumption from fossil fuels to cleaner energy sources. The call for energy transition is not new. However, the drive to shift to more sustainable energy consumption and usage increased due to the glaring adverse consequences of using dirty fuels. While many arguments have been made about adopting cleaner energy sources and the urgency they should attract, this article focuses on the implications of the impending shift on petro-dependent states, and developing economies like Africa, particularly Nigeria.

Nigeria is Africa's most populous nation and arguably controls the

largest economy on the continent based on GDP size. According to the country's National Bureau of Statistics, with a median age of 18 years, 50% of Nigeria's population is very young, while over 60% is within the active and productive age bracket of 15 to 65 years. Such a teeming population requires a thriving economy capable of stimulating and sustaining wealth and jobs, ideally across diverse industries and sectors. However, the country operates, to a large extent, a mono-product economy.

Like many other developing countries, the Nigerian economy depends on natural resources, in this case, oil and gas. The country began commercial oil production in 1956 and has discovered more oil reserves, placing it among the world's top 10 countries with the largest reserves. The country has been described as more of a gas than an oil-dominated province with proven gas reserves amounting to 180tcf. Judging from the fact that existing gas resources were discovered while prospecting for oil, it is estimated that its actual gas reserves could triple the current quantity.

Oil and gas revenue accounts for most



Q4, 2022

Oil and gas revenue accounts for most of Nigeria's income and foreign exchange. In Q4 2022, oil accounted for almost 80% of total exports and, at the end of 2021, was responsible for 41% of federally collected revenue.

of Nigeria's income and foreign exchange. In Q4 2022, oil accounted for almost 80% of total exports¹ and, at the end of 2021, was responsible for 41% of federally collected revenue.² This leaves the country susceptible to shocks in the international crude oil market. The country's dependence on oil and gas has persisted for decades despite cries to diversify the economy to broader income streams. The need for diversification has never been more pertinent and urgent, especially in view of the inevitable energy shift in the coming decades.

As a result of energy transition policies in major world economies, including the US, Europe, and China, the landscape of energy consumption is set to evolve over the next three decades, with implementation results projected to manifest as early as the end of this decade. According to the International Energy Agency (IEA), transportation accounts for more than 53% of global oil demand, of which road transport is responsible for over 80% share. As a result of this and as part of the overall climate change response, major policy directions aim to reduce and eventually eliminate the use of internal combustion engines (ICE) for road transportation, mainly passenger and freight vehicles, and replace them with electric vehicles (EVs). ICE consumes petrol and

diesel, which constitute the bulk of road transport fuels. For instance, in 2021, road transportation accounted for nearly 70% of petroleum consumption in the US, of which 86% was gasoline and diesel. In the same year, the US averaged daily consumption of 19.8 million bpd of refined petroleum products (EIA, 2022).³

Doubtless, when EV policies fully kick in, global energy demand is likely to receive a significant shock. When this will happen may be cumbersome to predict, especially amidst prevailing global geopolitical and economic challenges. The war between Russia and Ukraine, with its impact on the energy outlook across Europe, persists. One direct impact of the war is stalling some pro-energy transition policies in Western Europe in favor of resuming dirty fuels use due to energy security concerns. The UK plans to resume in-country natural gas production while countries like Germany, which were the vanguard of clean energy adoption, have reopened coal plants. With such factors, the timelines for complete adoption will be affected. However, the shift is inevitable. Therefore, analyzing the impending dent in oil demand and, consequently, oil revenue is still crucial, and petro-dependent states are better prepared to mitigate its impacts.

1. National Bureau of Statistics. Q4 2022 foreign trade statistics
 2. Central Bank of Nigeria. 2021 Statistical bulletin- Public Finance
 3. <https://www.eia.gov/energyexplained/oil-and-petroleum-products/use-of-oil.php>

This document introduces a series that intends to interrogate Nigeria's choices, risks, financing options, and investment opportunities as it transits its energy structure from fossil fuels dependency to cleaner energy sources. Wider conversations are planned for oil-producing communities, civil society, public sector institutions, and private sector leaders on advisory support for the energy transition team.

A photograph of an industrial facility, likely an oil or gas processing plant, featuring a complex network of large, dark-colored pipes and machinery. The scene is dimly lit with a strong blue color cast, creating a moody and technical atmosphere. The pipes are arranged in various directions, some running horizontally and others vertically, with several large elbow joints visible. In the background, more industrial structures and what appears to be a worker in a dark uniform are partially visible.

2.0

Fiscal Implications for Energy Transition in Nigeria



2.1 Nigeria's Petro-dependence and the Significance of Energy Transition on Petrodollars



61.4%

In the following two decades, i.e., 1991–2000 and 2000–2010, an annual average of 78.1% and 78.9%, respectively, of total federal revenue came from oil sales. The last decade (2011–2020) recorded a drop in the share of oil revenue, averaging 61.4%.

Nigeria depends on crude oil sales for most of its federal revenue. A decade-by-decade analysis using data obtained from the CBN shows that crude oil revenue accounted for 70.5% of total government revenue annually between 1981 and 1990. In the following two decades, i.e., 1991–2000 and 2000–2010, an annual average of 78.1% and 78.9%, respectively, of total federal revenue came from oil sales. The last decade (2011–2020) recorded a drop in the share of oil revenue, averaging 61.4%. In addition to government reforms targeted at increasing the share of non-oil

revenue in the country's finances, a global oil market triggered a recession in the middle of the decade, and a global health crisis occurring in the latter part of this decade may not be far from the reasons. These severely hampered several commodity markets, predominately the oil market, resulting in an oil revenue drop in petro-dependent states, especially those like Nigeria, which had no strong systems to withstand such shocks. As the data showed, in 2016, during the height of the oil market crisis, oil accounted for 48% of total revenue, while in 2020, the pandemic year, oil accounted for 51% of total revenue. The following year, 2021, recorded a further drop to 41%. It should be noted that other domestic challenges, such as insecurity and oil theft, also affected the oil sector performance in Nigeria.



41%

The following year, 2021, recorded a further drop to 41%. It should be noted that other domestic challenges, such as insecurity and oil theft, also affected the oil sector performance in Nigeria.

Figure 1: 40-year oil revenue: 1981–2021



Data Source: Central Bank of Nigeria (2022). 2021 Statistical Bulletin—Public finance statistics. Table B.1.1

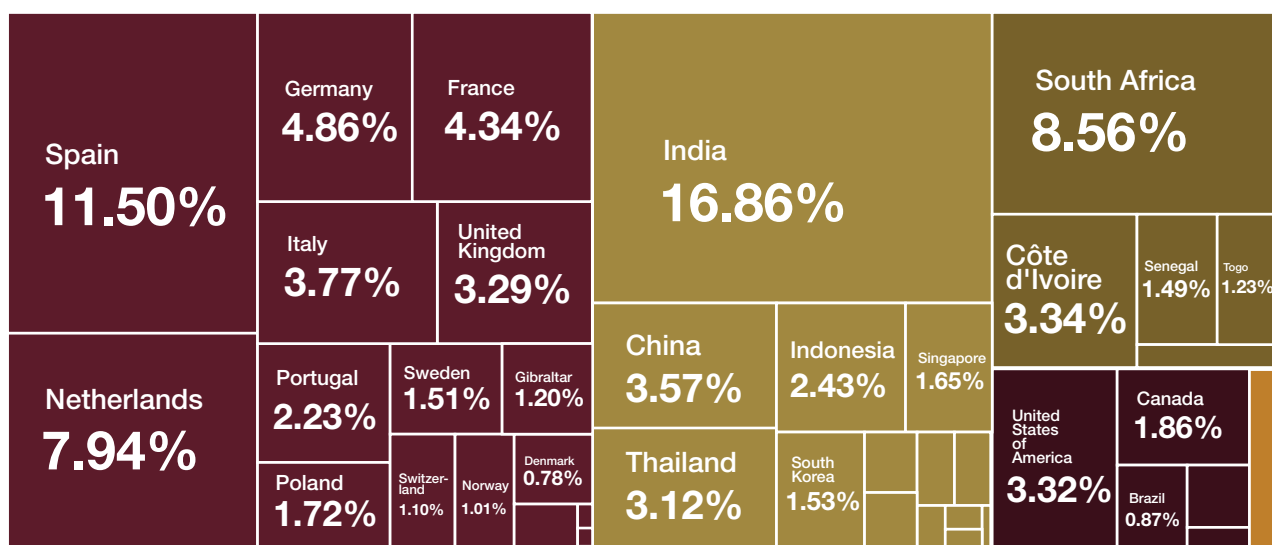
As shown, transition policies affect oil demand across the world, and more specifically, certain regions that comprise destination countries for Nigeria’s crude oil would have significant impacts on revenues. Available public data from the NBS list Nigeria’s crude oil top ten destinations, as shown in the table below. In the 4th quarter of 2022, these 10 countries were responsible for 65.54% of total exports and 68.82% of the total value of crude oil exports. This is corroborated by analysis by the Atlas of Economic Complexity, which also

shows that Europe accounts for the largest share of Nigeria’s crude oil exports, followed by Asia. Energy transition policies and emission reduction targets in Europe and Asia, especially in these 10 countries, would be a critical determinant of the fiscal stability of Nigeria as the world transitions to cleaner energy.

Table 1: Destination countries for Nigeria's crude oil exports

Ranking	Country of Destination	Value (N' Billion)	Crude Oil (N' Billion)	Non-Crude Oil Value (N' Billion)	% Share of Total Export
1st	Spain	617.17	383.39	233.78	9.7
2nd	Netherlands	574.55	517.65	56.90	9.03
3rd	India	490.45	420.88	69.57	7.71
4th	France	489.82	441.73	48.09	7.7
5th	Indonesia	473.27	462.68	10.59	7.44
6th	United States	454.89	429.78	25.11	7.15
7th	Brazil	305.02	240.06	64.96	4.8
8th	Italy	273.48	0.00	273.48	4.3
9th	Ivory Coast	273.33	269.17	4.16	4.3
10th	South Africa	215.93	214.92	1.01	3.4
% Share of top ten countries in total exports			68.82%	65.54%	

Source: National Bureau of Statistics (2023). Q4 Foreign trade statistics and tables

Figure 2: Product complexity distribution showing the destination of Nigeria's crude oil across the world

Destination countries for Nigeria's crude oil exports in 2020
 Source: Atlas of Economic Complexities. <https://atlas.cid.harvard.edu/>



80%

The transportation sector is fueled predominantly by liquid fuels, mostly Petrol and Diesel, which account for nearly 80% of global transport consumption.

Europe, North America, and Asia account for most global energy consumption. Energy transition and emission reduction policies that impact the use of conventional energy sources, predominantly fossil fuels, in these regions, would expectedly impact energy demand worldwide. Of the total global energy consumption, transportation gulps nearly 30%.⁴ Similarly, in the US⁵ and EU⁶, transport chunks nearly 30% of total energy consumption. The transportation sector is fueled predominantly by liquid fuels, mostly Petrol and Diesel, which account for nearly 80% of global transport consumption.⁷ Consequently, ET policies that affect the transportation sectors of trading partners in these regions are crucial to understanding the impact of ET on Nigeria's oil revenue. In Europe,

countries of interest to Nigeria are Spain, Netherlands, Germany, France, and the United Kingdom. In Asia, China and India are major trading partners of the country's crude oil, while the United States is a country of interest in North America. In Africa, major trading partners for Nigeria's crude oil are Ivory Coast and South Africa. So it may also be pertinent to examine how these African countries expect to handle the transition. However, this analysis will concentrate on the top 10 trading partners (table 1) responsible for about 70% of crude oil exports from Nigeria.

2.2 Impact of Energy Transition on Oil and Gas Demand 2021 to 2050

Scenario analysis by the IEA⁸ based on publicized policy intentions by various governments indicates an overall substantial uptake of clean energy alternatives which will replace conventional fossil fuels by 2030. In the United States, EV sales are expected to account for 30% to 50% (depending on the scenario) of car sales by 2030. This is attributed to the Bipartisan Infrastructure Act and the Inflation Reduction Act passed in 2021 and 2022, respectively. In the European Union, climate policies, high energy prices, and energy security concerns reduce fossil

fuel demand while spurring increased renewable energy adoption. By 2030, solar and wind energy are expected to provide 45% to 50% of total electricity generation in the EU, while EV sales are expected to account for 44% to 55% of car sales. Similarly, in China, EVs are expected to account for 50% of cars sold by 2030. South East Asia (including India) and Africa are expected to record increased energy demand over the decade due to the industrialization requirements of countries in these regions. However, 90% of global EV sales currently occur in the US, EU, and

4. <https://www.energyinst.org/exploring-energy/topic/transport>

5. <https://www.eia.gov/energyexplained/use-of-energy/transportation.php#:~:text=About%2028%25%20of%20total%20U.S.,from%20one%20place%20to%20another>.

6. https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Energy_statistics_-_an_overview#Final_energy_consumption

7. <https://www.eia.gov/todayinenergy/detail.php?id=23832>

8. World Energy Outlook, 2022.



36 countries

According to the IEA, 36 countries and several states have announced the phase-out dates for ICE vehicles' sales.

China. Few ICE vehicles are expected to be sold to developing and emerging countries, most of which are in Africa and Asia.

Specific to road transport energy demand which directly impacts oil demand and, by implication, Nigeria's oil revenues, the scenario-based analysis estimates the possibility of peak oil demand by the mid-2020s due to ET and climate-related policies. Less ambitious estimates move this timeline back by a decade to the mid-2030s at 103mb/d. Electric vehicles are critical to the oil demand drop. By 2030, EVs could account for about 35% of the global

market share of light-duty vehicles and 8% of heavy trucks. Vehicle electrification policies in Europe and America and by major car manufacturing companies drive these projections. According to the IEA, 36 countries and several states have announced the phase-out dates for ICE vehicles' sales. Major automobile manufacturers have announced similar policies, with most targets set for 2030 and 2035. The table below summarizes phase-out dates by country and automaker.

Table: 2 Selected policies and targets to phase out sales of Internal Combustion Engine (ICE) LDVs by country/state and automaker

Year	Country/State	Type of Vehicle
2025	Norway	LDVs
2030	Austria, Slovenia, Washington (United States)	LDVs
	Denmark, Iceland, Ireland, Netherlands, Singapore	Passenger cars
2035	European Union, Cape Verde, Canada, Chile, United Kingdom, California, Massachusetts and New York (United States)	LDVS
2050	Costa Rica, New Zealand*, Connecticut, Maryland, New Jersey, Oregon, Rhode Island, Vermont (United States)*	Passenger cars
Year	Automaker	Announcement (passenger cars)
2025	Jaguar	100% EV sales
2027	Alfa Romeo	100% EV sales
2028	Opel	100% EV sales in Europe



2050

Despite these policies and targets, the IEA still projects that Net Zero emissions by 2050 would not be feasible unless more ambitious efforts are taken, implying that given the right circumstances, more drastic commitments and actions could unfold with a significant impact on petro-dependent states like Nigeria.

2030	Bentley, Cadillac, Fiat, Mini, Rolls-Royce, Volvo	100% EV sales
	Ford, Stellantis	100% EV sales in Europe
	Honda	100% EV sales in China
2033	Audi	100% EV sales
2035	General Motors, Lexus	100% EV sales
	Hyundai, Volkswagen	100% EV sales in Europe
	Toyota	100% EV sales in West Europe

*Country/states included based on their membership in the International Zero Emissions Vehicle Alliance. Notes: LDVs = light-duty vehicles which include passenger cars and light trucks. This table covers those countries and states with legislation, a target or stated ambition in place to phase out the sales of ICE LDVs. Only automakers which have announced a complete phase out of ICE vehicles are included. West Europe includes European Union, European Free Trade Association countries and the United Kingdom.

Source: IEA. World Energy Outlook, 2022

As of 2022, EV car sales were estimated at 10 million units. This is expected to quadruple to 40 million by 2030, representing 35% of global EV sales. By 2040, EVs would account for two-thirds of total new car sales worldwide. Despite these policies and targets, the IEA still projects that Net Zero emissions by 2050 would not be feasible unless more ambitious efforts are taken, implying that given the right circumstances, more drastic commitments and actions could unfold with a significant impact on petro-dependent states like Nigeria. This is captured in a different scenario known as the Net Zero Emission (NZE) scenario. Although several factors, including energy efficiency, hybridization, and electrification, would impact energy demand reduction, the majority of demand destruction is attributable to the electrification of the vehicle fleet, which alone would account for at least 4mb/d by 2030 according to conservative scenarios.

Although new ICE vehicle sales are expected to gradually decline from this decade, ICE vehicles will continue to be in use until 2050, even in advanced economies. New ICE vehicles produced and sold before phase-out dates in 2030 and 2035 would likely still be in use, contributing to oil consumption and emissions. In addition, developing countries, at least those with announced phase-out dates, are not expected to end the sales of ICE vehicles before 2050. This implies continuous demand, however declining, for oil over the next couple of decades. As demand falls, oil prices may likely follow, with investments in oil production in tow. The corresponding declining investments in oil production imply fewer suppliers, which, however, may end up canceling some of the impacts of the falling demand.

On the other hand, existing suppliers may simply shift focus to markets with

higher demand for oil which would likely be in Africa and South Asia, thereby sustaining higher supply levels relative to demand, causing a fall in price. This would also mean greater competition for oil and gas companies operating in those regions. Whatever the case may be, the future of the oil market will increasingly become volatile, requiring more efforts to maintain market share

and sustain oil revenues. Invariably, the clock is ticking on revenue streams from oil, and Nigeria, sooner than later, had better prepare strategic and decisive steps to mitigate the impending threat to revenues.



38.8%

Global oil supply, on the other hand, is expected to be sustained till 2030 but will drop by 38.8% by 2050.

2.3 Projected Impact of Falling Oil Demand on Revenue in Nigeria

Several projections present different scenarios for oil demand over the coming decades. This analysis would be primarily based on the Stated Policy Scenario (STEP) and Announced Policy Scenario (APS) by the IEA. STEP refers to policies backed by legislation, while APS encompasses STEP to include policies expressed by governments but may not be backed by legislation. A more ambitious scenario by the IEA, known as the Net Zero Emissions (NZE) by 2050 scenario, ideally spells out the extent of action required on a global scale if the world is expected to meet emissions targets that would prevent catastrophic climate change-related events. A significant impact on oil revenues will be experienced in events

under the APS and NZE. Under the APS, world oil demand is expected to drop by 1.6% by 2030 and 39.5% by 2050 relative to 2021. The road and transport sub-sector will also drop by 6.7% and 57.3%, respectively, over the same timeline. Global oil supply, on the other hand, is expected to be sustained till 2030 but will drop by 38.8% by 2050. Conventional crude oil production, however, is expected to drop by 5.5% by 2030 and 48.8% by 2050. Crude oil price is expected to hover at USD[2021]64/b in 2030 and USD[2021]60/b in 2050.

Table 3: Global oil demand and supply projections (mb/d)

		APS		
	Sector	2021	2030	2050
Oil Demand	Road Transport	40.5	37.8	17.3
	Aviation	9.9	12.8	9.5
	World Oil demand	94.5	93.0	57.2
Oil Supply	Conventional Crude	60.1	56.8	31.0
	World Oil Production	96.7	90.7	55.3
OPEC Share		35%	36%	43%
Crude Oil Price USD[2021]/b		69	64	60

Source: IEA

As mentioned earlier, ET policies in select regions and countries are crucial to the sustainability of Nigeria's oil revenue stream, especially in the short

term. The following tables and charts attempt to show the projected outlook for oil demand in these locations.

Table 4: Oil demand outlook in select regions and countries (mbpd)

Region/Country	2021	2030	APS	
			2040	2050
United States	17.7	15.8	8.4	5.0
Brazil	2.4	2	1.4	0.9
EU	9.2	6.5	3.1	1,7
South Africa	0.5	0.5	0.4	0.3
China	15.1	15.2	11.0	7.6
India	4.7	5.9	5.4	3.9
South East Asia	4.9	6.0	5.2	3.9
Africa	3.8	4.9	5.8	6.1
Asia Pacific	33.3	35.1	28.1	20.6
World Oil	94.5	93.0	72.9	57.2

Source: IEA World Energy Outlook 2022.

Figure 3: Oil demand outlook in select countries and regions

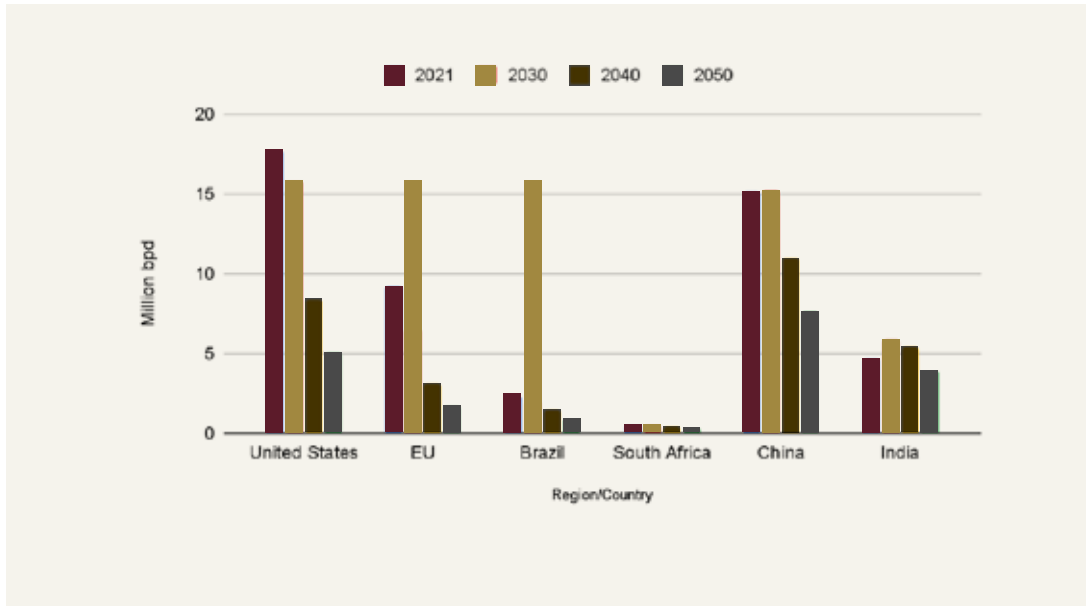


Figure 4: Oil demand outlook in select regions

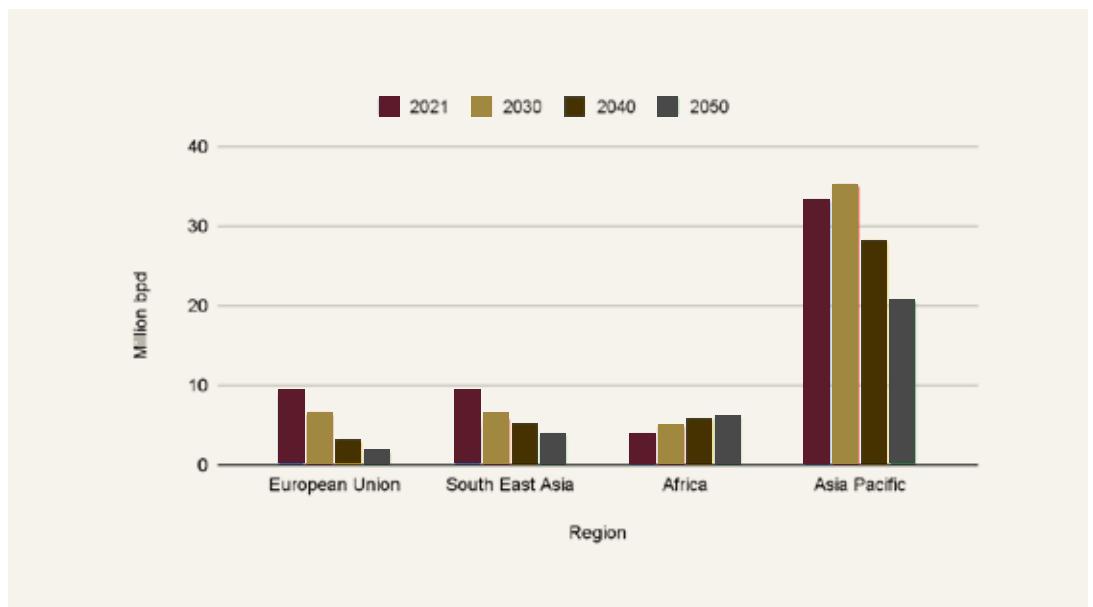


Table 5: Percent drop in oil demand in select regions and countries relative to 2021 based on APS

Region/Country	2021 mbpd	Decade-by-decade drop in oil demand		
		2030	2040	2050
United States	17.7	10.73%	52.54%	71.75%
Brazil	2.4	16.67%	41.67%	62.50%
European Union	9.2	29.35%	66.30%	81.52%
South Africa	0.5	0.00%	20.00%	40.00%
China	15.1	-0.66%	27.15%	49.67%
India	4.7	-25.53%	-14.89%	17.02%
South East Asia	4.9	-22.45%	-6.12%	20.41%
Africa	3.8	-28.95%	-52.63%	-60.53%
Asia Pacific	33.3	-5.41%	15.62%	38.14%
World Oil	94.5	1.16%	26.66%	48.98%

Negative percentage implies a rise in oil demand
Source: Author's computation based on IEA data


20%

India's oil demand growth will also slow down by 2040 and become completely reversed by 2050, dropping by more than 20%, even though oil demand by 2040 will not have returned to 2021 levels.

The largest drop in oil demand in terms of proportions among the selected countries is expected to come from the European Union in the short and long term. While in terms of volumes, the Asia Pacific and the US each project the largest oil demand destruction. The EU region is also Nigeria's largest trading partner for crude oil, accounting for nearly 30% of total crude oil exports from Nigeria in the 4th quarter of 2022. This implies that by the end of this decade, crude oil exports to trading partners in the EU, and consequently, revenue accrued from such exports,

could fall by nearly 30%. Similarly, revenue from oil sales to the US could fall by almost 11% and to Brazil by more than 16%. This may be balanced by a rise in demand in emerging economies like China, India, and Indonesia (South East Asia), all of which trade in Nigeria's crude oil. However, in the medium to long term (2040 to 2050 and beyond), more climate and ET targets are expected to be met, resulting in more cuts in oil consumption in advanced economies (EU and US) while China's marginal rise in oil demand in 2030 is reversed to a significant fall (more than



In reality, the market dynamics and the way the country responds could sway Nigeria's market share upwards or downwards. Customers could be acquired from previously untapped markets while, at the same time, some existing customers may be lost.

27% by 2040 and nearly 50% by 2050). India's oil demand growth will also slow down by 2040 and become completely reversed by 2050, dropping by more than 20%, even though oil demand by 2040 will not have returned to 2021 levels. A similar trend is expected in Southeast Asia and the Asia Pacific region. Africa appears to be the only region to maintain a rising oil demand until 2050.

Assuming Nigeria's exports are equally affected by the respective margins in oil demand reduction for simplicity of analysis, the country's oil revenue could be down by less than 2% by 2030. This is because, as mentioned earlier, rising

oil demand in the developing world nearly cancels out the effect of losses due to cuts in oil consumption in advanced economies. However, by 2040, oil revenue could be down by 37.6%, and by the middle of this century will be down by 58%. This is, however, based on the unlikely assumption that the country's clientele and their respective portfolios will remain static over the next 30 years. In reality, the market dynamics and the way the country responds could sway Nigeria's market share upwards or downwards. Customers could be acquired from previously untapped markets while, at the same time, some existing customers may be lost.

Table 6: Nigeria's oil trade outlook relative to 2022

Trading partner country/region	Crude oil Q4 2022 (N' Billion)	Crude oil 2022 est. (N' Billion)	Revenue change 2030 (N' Billion)	Revenue change 2040 (N' Billion)	Revenue change 2050 (N' Billion)
EU*	1,342.78	5,371.11	-1,576.42	-3,561.05	-4,364.03
United States	429.78	1,719.12	-184.46	-903.23	-1,233.47
Indonesia	462.68	1,850.71	415.49	113.26	-396.24
India	420.88	1,683.50	429.80	250.67	-286.53
Brazil	240.06	960.24	-160.07	-400.13	-600.15
South Africa	214.92	859.69	859.69	-171.94	-343.87
Total	3,111.09	12,444.38	-215.98	-4,672.40	-7,224.29
Total Revenue Change			-1.74%	-37.55%	-58.05%

*EU comprises Netherlands, Spain, and France



13 States

According to the 2022 report on the fiscal sustainability of state governments in Nigeria, 13 states depend on FAAC allocation for at least 70% of revenues. More broadly, 33 out of 36 states depend on FAAC allocation for at least 50% of their revenue

Whatever the case, by 2050, oil revenue as the main stream of income would be lethal to Nigeria. Existing arrangements for funding the economy are risky. As the years' progress, the country may increasingly struggle to fund its budget and sustain FAAC allocations to subnational governments. According to the 2022 report on the fiscal sustainability of state governments in Nigeria, 13 states depend on FAAC allocation for at least 70% of revenues. More broadly, 33 out of 36 states depend on FAAC allocation for at least 50% of their revenue.⁹ Certainly, most sub-nationals would find it difficult to pay salaries, let alone fund development projects. As a result, borrowings may likely increase, adding to the country's mounting debt profile at federal and state levels. Creditors would increasingly become skeptical of the country's ability to pay back debts, as recently demonstrated by Moody's downgrade of Nigeria's credit rating,¹⁰ with consequences that may include a rise in the cost of borrowing. As a result, debt servicing, which stood at 80% of total revenue at the end of 2022,¹¹ would yet jump to astronomical levels.

Furthermore, due to limited oil revenue, inputs to the Country's Excess Crude Account (ECA) and Sovereign Wealth Fund (SWF) may be difficult to continue. Reduced foreign exchange implies lower foreign reserves and a weaker currency. As oil demand falls, corresponding investments in oil production are likely to follow. Fewer companies operating and lower production capacity translates to reduced oil revenue. Therefore, several programs that depend on funding from oil proceeds could be severely impaired.

For instance, agencies like the NCDMB and NNDC are funded respectively by 1% of all petroleum upstream contracts¹² and 3% of the total budgets of oil-producing companies operating in the Niger Delta region.¹³ Diminished funding could limit local content development programs, credit schemes, and developmental projects targeted at oil-producing communities.

To mitigate the slump in oil sector demand in the long run, Nigeria needs to:



of States Report

10. Moody's investor Service, Moody downgrades Nigeria's rating to Caa1 with a stable outlook. https://www.moody.com/research/Moodys-downgrades-Nigerias-ratings-to-Caa1-with-a-stable-outlook--PR_472793

11. <https://www.bloomberg.com/news/articles/2023-01-05/debt-payments-consume-80-of-nigeria-s-revenue-collection#:~:text=Nigeria%20spent%2080%25%20of%20its,improve%20its%20finances%20in%202023.>

12. Nigeria Oil and Gas Industry Content Development Act, 2010

13. Niger Delta Development Commission Development Act 2000

9. BudgIT. 2022 State



Nigeria already supplies crude oil to the Ivory Coast and South Africa, which are among its top ten crude oil trading partners. These kinds of commercial relationships can be expanded to include more volumes and countries on the continent. It can also be further extended to South East Asia, another region projected to record increased oil demand for at least the next two decades.

• Scale-up Domestic Refining Capacity

The need for improved domestic refining capability of petroleum products cannot be more consequential for Nigeria in 2023. Apart from the huge subsidy bills and the pressure on the naira as a result of importing refined petroleum into the country, the security of supply for a commodity that drives economic activity is of enormous importance. Nigeria must ensure it can produce enough refined petroleum products to meet domestic demand and support regional consumption. Concerted efforts toward rehabilitating the country's existing refineries should be prioritized and strengthened. Additional privately run refineries like the Dangote Refinery should be encouraged with the right policy tools and conditions. These include obtaining the right fiscal and macroeconomic instruments that encourage investments while ensuring adequate security for investments, personnel, and logistics operations.

• Expand Into New Markets

Oil demand is expected to continue to increase in Africa between now and

2050. This means the region would continue to sustain oil markets to a certain extent. Nigeria should plan to dominate the oil market in Africa for the next three decades. This should reflect in infrastructural investments that facilitate an economically efficient mode of transporting both crude and refined petroleum across the continent, especially in West Africa. Existing regional political and economic frameworks such as ECOWAS, AU, and AfCFTA should be exploited. Nigeria already supplies crude oil to the Ivory Coast and South Africa, which are among its top ten crude oil trading partners. These kinds of commercial relationships can be expanded to include more volumes and countries on the continent. It can also be further extended to South East Asia, another region projected to record increased oil demand for at least the next two decades. Nothing could be more ignominious than if, by 2040 or 2050, in a clean energy economy, Africa's oil demand is supplied by countries that neither consume oil nor exist within the geographical periphery of the continent.



A Quick View of Nigeria's Dependence on Oil

In recent years, oil price and production have been a free fall, and Nigeria's economy and public finances, which has a direct relationship with oil prices, have faced significant pressures. While increased earnings from the oil and gas sector Below are some of the issues that highlight the challenges on the petro-state.



- **Exchange Rate Volatility:** 80% of foreign exchange earnings from exported goods are tied to oil, and with shortened revenues in dollar terms, the Naira will be under continuous pressure. Nigeria's non-oil export market is still less than \$5bn, and fluctuation in oil price and production in recent years has seen Nigeria's currency being significantly devalued from NGN 216 in 2015 to N740 in 2021 (parallel market) when compared to the dollar. While devaluation might signal Nigeria earning more in naira terms, the cost of goods and services and other recurrent costs continue to rise.

- **Debt Spiking:** With the shortening of public sector revenues, the Nigerian government has resorted to borrowing from its apex bank, domestic market, and foreign exchange market. This significantly impacts debt servicing in the short and long term. Nigeria has borrowed over \$13bn from Eurobonds in the last eight years, partly used to shore up FX liquidity. With stagnated savings for foreign earnings, raising debts is the glaring alternative.

- **Savings Stagnation:** Previously, Nigeria kept a decent balance in the Excess Crude Account. Energy Transition from oil revenues means it might be difficult for FG to save funds in the Sovereign Wealth Fund, considering the austerity measures of the times. Accretion to the External reserves is also expected to slow down as Nigeria severs its dependence on oil revenues. Nigeria's Sovereign Wealth Fund currently holds \$2.95bn.

- **Capital Expenditure Under Threat:** The haste to spend on recurrent items will remain, as they are fixed charges,

unless drastic reforms such as downsizing personnel and sharp cuts in overhead costs occur. Capital Expenditure performance might be threatened with weaker earnings as the government strives to keep its deficit within the limits of the Fiscal Responsibility Act whilst ensuring it meets its day-to-day obligations. While the current government has used an extra-budgetary approach through Ways and Means from the Central Bank, it might not continue to have such luxury due to the inflationary pressures.

- **Subnational Crisis:** Energy transition will have a significant impact on sub-national governments with huge dependence on centrally distributed revenues. According to BudgIT's 2022 report on the fiscal sustainability of state governments in Nigeria, 13 states depend on FAAC allocation for at least 70% of revenues. More broadly, 33 out of 36 states depend on FAAC allocation for at least 50% of their revenue. As of 2016, when oil faced significant price reductions, 28 out of 36 Nigerian states owed at least three months of workers' salaries, and the federal government provided a series of palliatives and interventions through the Paris Club refunds to provide fiscal space for states.

- **Financial Sector Exposure:** While the Nigerian oil industry represents 7% of Nigeria's economy, the banking industry has relatively huge exposure to the sector. As of 2021,¹⁴ Nigeria's banks advanced N16.39tn to the oil and gas sector (industry and services), representing 23% of the total credit by the financial sector. A distressed oil and gas sector with a relatively huge service sector will also impact Nigeria's banking industry if not properly managed.

14. <https://nigerianstat.gov.ng/eLibrary/read/1241238>

3.0

Appraising Nigeria's Energy Transition Plan





which ranges from rural electrification projects, grid management, and support for the distribution framework. The plan also offers a \$23bn investment plan on various sectors—power value chain, metering, e-mobility, and healthcare—also includes \$2bn in government guarantees to derisk investments in the energy sector. The plan also includes seeking the support of \$1bn in technical assistance in generation, grid management, gas, transport, markets, and creating an enabling environment.

Nigeria's ETP plans to create 340,000 jobs in the sector & 840,000 jobs by 2060, with enough buffer to mitigate job losses in the fossil fuel sector. Around 370,000 jobs are planned to be created from clean cooking, and power is planned to offset job losses in the energy sector.

Nigeria's plan is to replace its diesel-generators-powered industrial sector with natural gas-fired power and also a mix of renewables. It also plans to give numerous incentives for independent power generation and fixed tariffs for energy generated from renewable sources. The Rural Electrification Agency, with partners¹⁵ Rockefeller Foundation and SE4ALL,

In 2022, the Nigerian government launched an Energy Transition Plan (ETP) to underscore its mission to achieve Net Zero emissions by 2060, a commitment made by President Buhari at COP 26 in Glasgow. Nigeria seeks to invest an additional \$410bn in funding by 2060 and has defined incremental funding of \$10bn per annum to achieve this goal. The total fund required to reach Net Zero emissions by 2060 is \$1,9tn.

The ETP recognizes gas as the main transition fuel and seeks to invest in gas flare-out commercialization and also rapid investment in the renewable energy mix, which includes photovoltaic and hydropower plants. Part of the funding it has unlocked includes the \$2bn funding from World Bank,



\$410bn

Nigeria seeks to invest an additional \$410bn in funding by 2060 and has defined incremental funding of \$10bn per annum to achieve this goal. The total fund required to reach Net Zero emissions by 2060 is \$1.9tn.

15. https://www.seforall.org/system/files/2022-01/Nigeria_IEPT-Executive_Summary.pdf

had already proposed a sum of \$25.8bn as funds as required for Nigeria to reach universal access to electricity. This includes a plan for 5m solar home systems and 8.9 mini-grid connections expected to reach 106m people through access to 8.4GW.

Observations

- **ETP needs details on governance and implementation framework:**

Nigeria needs a more comprehensive energy transition document as accessible documents do not situate the climate risks that Nigeria faces, and different interventions in energy, cooking, healthcare, and so on tend to mitigate the challenges. The documents also do not provide a leadership framework beyond the current administration and how it intends to institutionalize its plan within the Nigerian bureaucracy. While the Nigerian President has inaugurated the National Climate Change Council (NCCC), which is expected to lead on a sustainable framework for climate-related activities, it is important to understand how the Energy Transition Office will be integrated with the Council and other key stakeholders, such as Rural Electrification Agency, Ministry of Power among others. There's a need for details on governance mechanisms, operational structures, risk management frameworks, community-level engagement, and monitoring and evaluation approaches.

- **Need for extensive feedback with multi-stakeholders:**

While the documents also set ambitious targets, there's no clarity on whether wider stakeholder sessions were held to provide feedback on the targets related to clean cooking, renewable energy, mini-grid systems, and other initiatives. The Energy Transition Plan needs a multi-stakeholder approach to ensure effective implementation and reasonable assessment from non-state actors. Engagement with multiple stakeholders needs to be properly detailed to understand the plurality of views towards a fair and equitable energy transition process.

- **ETP needs a detailed national skills development program, not just technical assistance:**

While Nigeria might have underlying challenges of weak access to power, there were not enough analysis to show that the country wants to leapfrog into the production of climate-smart initiatives such as EV production, battery storage development, charging infrastructure, offshore wind technology, biogas, and other initiatives. The plan doesn't also include a national strategy to build up skills in these areas to ensure that Nigeria plugs into new frontiers in the use of energy and mobility. How does the Nigerian ETP address foundational skills required in the energy of the future and also ensure gender and social inclusion within the framework? There also needs to be more specific on



Nigeria needs a more comprehensive energy transition document as accessible documents do not situate the climate risks that Nigeria faces, and different interventions in energy, cooking, healthcare, and so on tend to mitigate the challenges. The documents also do not provide a leadership framework beyond the current administration and how it intends to institutionalize its plan within the Nigerian bureaucracy.

how to engender EV-powered mass transit systems as pathways in decarbonization in urban centers.

- **Need to intersect ET with National Development Plan:**

There is also a need to synthesize Nigeria's ETP with its National Development Plan. With the country having set a robust development plan in the near term, how does the Energy Transition Plan support the implementation of energy goals by 2030? The National Development Plan seeks to invest massively in infrastructure, ensure macroeconomic stability, enhance the investment environment, improve social indicators and living conditions, and implement climate change mitigation, adaptation, and resilience strategies, amongst others. This can be done in synergy with the energy transition to ensure rapid infrastructure development that will align with the ETP. For example, through programs such as the Energising Economic Initiatives and Energising Education Programme, the country aims to provide energy for select clusters of consumers in rural and urban locations across the country through mini-grid and off-grid solutions powered by renewable energy. In doing this, Nigeria aims to achieve a target of 1GW of renewable energy generation by 2025. The country's Nationally Determined Contributions push this further to 13GW by 2030, a very big leap within five years. Meanwhile, the ETP broadly identifies a target of 220GW of

renewable energy generation, supplemented by 90GW of storage and 34GW of hydrogen systems needed for Nigeria to achieve Net Zero by 2060. Certainly, there is a need for an alignment of policies and goals.

Transition Risks Require Stronger Interrogation: Also, Nigeria's ETP needs a detailed transition risk assessment to fully understand what severing fossil fuel dependence would mean for the country. There is not enough interrogation of the connection of Nigeria's economy to fossil fuels as well as the development of a graduated plan to ensure the full embrace of cleaner technologies in a manner that still manages social cohesion, economic sustainability, and fiscal status of the country. These transition risks should consider the oil-producing communities and other programs dependent on the oil revenues, such as NDDC. How does the Nigerian government provide an equitable and just transition for these environments, including the diversification of local economies? These conversations should also include timelines and a phased approach to define how host communities can cope with new provisions in the Petroleum Industry Act.

- **Subnational Governments Need Inclusion:**

While it might be critical for the federal government to lead the conversation on an energy transition plan, it is also pertinent that there's a subnational



The National Development Plan seeks to invest massively in infrastructure, ensure macroeconomic stability, enhance the investment environment, improve social indicators and living conditions, and implement climate change mitigation, adaptation, and resilience strategies, amongst others.



There is a need to use the current plan to deeply engage with wider stakeholders at community levels on the critical needs that intersect with Nigeria's transition plans.



framework to support the execution of the program. New constitutional and policy frameworks are giving leeway to states to also adopt cleaner energy sources in an inclusive manner that provides jobs.

- **Community Inclusion & Equitable Access:**

While clean cooking and mini-grids were important elements of Net Zero emissions, there's a need to fully define how community engagement strategies

will be incorporated into the ETP. There is a need to use the current plan to deeply engage with wider stakeholders at community levels on the critical needs that intersect with Nigeria's transition plans. Conversations must be centered around equity and fair access to energy while also considering support for communities that have faced significant environmental damage.

A photograph of an industrial facility, likely a refinery or chemical plant, during sunset. The sky is a deep orange and yellow, with a large plume of white smoke rising from a tall chimney on the left. The foreground is filled with dark, silhouetted trees and bushes. The overall scene is industrial and atmospheric.

4.0

Financing Options

Financing Options	Actions
Private Sector	Seek the support of the private sector in funding renewable energy grid programs and distribution to residential and industrial areas. Private sector and government to expand funding for national gas projects and gas flare commercialization programs. The government provides tax incentives and guarantees for climate-driven projects, thereby incentivizing the financial sector. Expand partnerships for transition metals investments and support for the value chain.
Subnational Government Partnerships	Use new constitutional amendments to engage state governments in building sustainable energy projects through loans and equity arrangements.
Green Bonds	Central government issues rounds of green bonds with the delivery of programs in local communities in an inclusive manner, especially small-scale energy projects.
Carbon Credit & REDD+	Government to fully utilize the voluntary credit market by using its diplomatic tools to scale up trading and investment in the developing world. Expand REDD+ for carbon sinks, especially Cross River State, among others.
Repurposing Fossil Fuel Subsidies	A component of fossil fuel subsidies savings can be re-purposed to provide cheaper access to small-scale renewable energy projects and clean cooking programs. Programs can target the most vulnerable without the capacity to pay back under an accountable framework.
Concessionary Multilateral Loans	Seek support for concessionary loans to support access to energy in low-income households and also the hydro/gas infrastructure readiness for transmission and distribution networks.



\$1.9 trillion

At the launch of Nigeria's energy transition plan, the government said it needed \$1.9 trillion to reach net-zero emissions by 2060, including \$410 billion above the projected usual spending.

During the 2021 UN General Assembly, Nigeria reiterated its commitment to a just energy transition and called for financial support from developed countries to achieve this (UN, 2021). While Nigeria's energy transition plan spells out its plan to achieve SDG7 by 2030 and net-zero emissions by 2060, its ultimate goal is to mobilize financing to implement the plan. Some challenges threaten the ambitious plan despite Nigeria having unfolded its energy transition plan to take advantage of its benefits, including ending energy poverty, economic growth through industrialization, and employment opportunities.

One of the greatest challenges is the considerable cost of transitioning from the current carbon energy sources. At the launch of Nigeria's energy transition plan, the government said it needed \$1.9 trillion to reach net-zero emissions by 2060, including \$410 billion above the projected usual spending. This additional cost translates to about \$10 billion¹⁶ annually. The question then is, where will the money come from? Without adequate funding for the energy transition plan, the objectives may not be realized nor will the deadline be achieved.

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



4.1 Private Sector



20%

Lagos State Government has already hinted at an agreement with the World Bank on “achieving 1GW of installed PV capacity by 2030 with a proposed mix of 60 per cent commercial and industrial, 20 percent residential, and 20 percent government-owned buildings.”

The federal government has indicated that the bulk of funding for Nigeria’s energy transition will come from the private sector. However, adequate measures need to be set to ensure that the country gets the appropriate investors that will be committed to this. The federal government has also put several fiscal incentives and sector reforms in place to catalyze private sector activity, such as a tax holiday of an initial three-year period for companies involved in independent power generation. Additional reforms are now being implemented, such as the establishment of a Climate Change Fund as proposed in the approved 2021 Climate Act and the alignment of Nigeria’s Nationally Determined Contributions (NDCs) with the Net Zero pathway.

Financial institutions most likely face major barriers to helping finance clean energy projects. These include a lack of familiarity with clean energy projects, insufficient information, high perceived risks, and a lack of suitable financing instruments and funds. Hence, the government should work with banks to establish project finance structures for renewable energy and energy efficiency projects that could be standardized and

widely replicated across various banks.

The recent constitutional amendments that give states the power to generate, transmit and distribute electricity might provide the necessary legislative backing and policy framework for states to tap into renewable energy. Lagos State Government¹⁷ has already hinted at an agreement with the World Bank on “achieving 1GW of installed PV capacity by 2030 with a proposed mix of 60 per cent commercial and industrial, 20 per cent residential, and 20 per cent government-owned buildings.” The initial 500MW project is expected to be financed through a mix of grants, equity, and concessionary debt. Nigeria states can also be supported by the federal government and its investment vehicles to expand renewable energy, thereby improving the energy mix in the country.

Adequate attention should be paid to social implications to make the finance of energy transition effective, financing structures should align with the incentives of risk capital providers. The financial vehicles through which the funding is provided must provide diversification for investors while allowing for swift project approval.

17. https://psc.solaruk.com/blog/lagos-partners-world-bank-on-solar-power/?fbclid=IwAR1_PsreQJP8wu9MNoskPXjKLUStBfgVRIKLIPZjGt7-fGN0bM9fH6M-Ueo



4.2 Repurposing Fossil Fuel Subsidies



Technology dependency on other countries is one of the major barriers to improving energy access in Nigeria, accelerating clean energy transitions would possibly entail public support for the manufacture of renewables, as well as efforts to build the implementation and maintenance capabilities necessary to sustain the local value chain.

Repurposing fossil fuel subsidies can also be a finance option for the energy transition. However, subsidies must target technology capacity-building and infrastructure projects focusing on energy generation, transmission, and distribution networks. Public funds from fuel subsidies could be repurposed to stimulate private investment in the electricity sector. Fossil fuel subsidies could be repurposed to support renewable investment, from utility-scale plants to small-scale solar home systems. Nigeria has the largest mini-grid installation market in sub-Saharan Africa, this indicates that solar energy has the potential to replace diesel generators, which account for 16.6% of Nigeria's self-generated electricity (Nnodim, 2021).

High capital costs of renewable energy make it less attractive for prospective consumers and make fossil fuels the preferred energy option for middle and low-income households. Fossil fuel

subsidy reform would shift these underlying constraints if the funds could be repurposed to make clean energy cheaper and affordable. Repurposing fossil fuel subsidies could make clean energy alternatives more competitive and free up resources for critical social and economic priorities that can enable a just transition down the line.

Technology dependency on other countries is one of the major barriers to improving energy access in Nigeria, accelerating clean energy transitions would possibly entail public support for the manufacture of renewables, as well as efforts to build the implementation and maintenance capabilities necessary to sustain the local value chain.



4.3 Green Bonds



Green bonds, also called climate bonds, are debt instruments intended to encourage sustainability and support climate-related and other types of special environmental projects. These projects include but are not limited to green building projects, public transport infrastructure, renewable energy, solid waste management, sustainable agriculture, etc.

Africa is expected to be the most hit by the adverse impacts of climate change if significant investments in mitigation and adaptation do not happen. The issuance of green bonds as a tool for unlocking significant capital for sustainability-related investments has been gaining traction in Africa in recent years, but the market for green bonds in Africa is still underdeveloped. Nigeria is currently the only climate-certified sovereign green bond issuer in Africa, while South Africa has issued a number of municipal green bonds.

Green bonds, also called climate bonds, are debt instruments intended to encourage sustainability and support climate-related and other types of special environmental projects. These projects include but are not limited to green building projects, public transport infrastructure, renewable energy, solid waste management, sustainable agriculture, etc. Also, they are used to finance the cultivation of environmentally friendly technologies and climate change mitigation. The distinct characteristic of a green bond is that the proceeds are

used exclusively to finance or re-finance environment-friendly projects, such as clean water and renewable energy.

Nigeria has sought to explore various sources of green finance, particularly green bonds, to finance its climate and sustainability goals. It became the only state in Africa and the fourth in the world (after Poland, France, and Fiji) to issue a sovereign green bond in December 2017. This is the first Climate Bonds-certified sovereign bond. The size of the green bond issued was N10.69bn with a five-year tenure to fund projects to finance renewable energy (solar power, 80%) and afforestation projects (land use change, 19%). It subsequently issued another green bond in 2019, raising a total of N15bn.¹⁸ There are many opportunities for developing and issuing green bonds domestically, if the right structures are put in place, there are significant domestic investors willing to play their part in attracting international investors.

¹⁸<https://www.mondaq.com/nigeria/climate-change/1278114/a-case-for-an-increase-in-the-issuance-of-green-bonds-in-emerging-and-developing-economies>

4.3.1 Benefits of Green Bonds

Investor Benefits	Issuer Benefits	Systemic Benefits
Comply with regulation	Increase investor demand and diversification	Stimulate positive stock market reaction and improvements in financial performance
Invest in sustainable products and initiatives without taking on additional risk	Improve relationships with debt providers	Foster green innovations
Develop better-informed investment strategies	Strengthen issuers' relationship	Help transition towards low-carbon and resource-efficient economies
Broaden restricted investment portfolios	Enhance issuers' reputation and brand value	Contribute to public-private partnerships development opportunities
	Help communicate issuers' sustainability narrative and strategies	Facilitate the implementation of climate policies
	Boost integration between finance and sustainability teams	
<p>Source: Climate Bonds Initiative 2021</p>		



4.4 Carbon Credit Market



\$6bn Revenue

The ACMI plans to produce 300 million carbon credits annually by 2030 and 1.5 billion credits annually by 2050. It also plans to unlock 6 billion USD in revenue by 2030 and over 120 billion USD by 2050. The initiative also proposes to support 30 million jobs by 2030 and over 110 million jobs by 2050.

The current scale of financing available for Nigeria's energy transition is nowhere close to what is required. Hence, the carbon credit market is another form of financing opportunity for the energy transition in Nigeria. The carbon credit market can support climate change mitigation efforts by creating an economic incentive for reducing emissions from the forest sector in a cost-effective manner, enabling forested countries to raise their climate ambitions while also supporting a transition towards a low carbon and climate resilient global economy. The carbon credit market would offer the country the opportunity for growth, industrialization, economic value, and job creation for its growing population and provide the right incentives for clean energy and climate action. The carbon credit initiative prioritizes the use of environmentally friendly energy sources for domestic and industrial purposes. The Carbon Market pipeline could create 30 million jobs in the next decade, with the potential to create more than 100 million jobs through climate-aligned projects by 2050.¹⁹

Recently, Nigeria pioneered the Voluntary Carbon Market in Africa known as the Africa Carbon Markets Initiative

(ACMI), which it launched at the (International Climate Change Conference of the Parties) in Egypt in November 2022. According to the Initiative, ACMI estimated that Nigeria can generate as much as 30 million carbon credits every year by 2030, which can earn the country at least 500m USD²⁰. The ACMI plans to produce 300 million carbon credits annually by 2030 and 1.5 billion credits annually by 2050. It also plans to unlock 6 billion USD in revenue by 2030 and over 120 billion USD by 2050. The initiative also proposes to support 30 million jobs by 2030 and over 110 million jobs by 2050.

The Global Carbon Credit market is estimated USD 760.28 Billion in 2021 and is expected to grow at a CAGR of 21.14% during the forecast period of 2023-2028 as more countries and corporate organizations commit to the next emissions. While there has been previous enthusiasm for carbon credit markets, the Russia-Ukraine war and the recent breakdown in multilateralism, might endanger the pursuit and African countries' needs to use global diplomatic ties and international fora engagements to strengthen the case for increased voluntary carbon trading in

¹⁹ <https://dailytrust.com/osinbajo-with-potential-30m-jobs-next-decade-carbon-credit-market-can-create-positive-on-nigerias-economic-growth/>
²⁰ <https://carboncredits.com/nigeria-billion-dollar-voluntary-carbon-market/>

Africa and other developed countries who bore the brunt of climate change. However, there are calls for setting the right standards²¹ for carbon trading and permissible projects by Integrity Council for the Voluntary Carbon Market. Carbon credit program including the Reducing Emissions from Deforestation and Forest Degradation (REDD+) opportunities. This

can include expanding the programs in Cross River—which holds over 50% of Nigeria’s forest reserves which is 1,366,929ha of the country’s forest area—and such programs must be centered on inclusive community engagement and effective localization.



21. <https://www.whitecase.com/insight-our-thinking/africa-focus-winter-2022-credit-where-credits-due>



4.5 Notes on Investment Opportunities of Energy Transition Plan



The development of renewable energy sources opens up the prospect of increasing the indigenous energy supply, thereby contributing to greater self-sufficiency.

Summary: The ETP needs to set up a phased process to elicit interest, especially at the community level. It needs a solid pricing mechanism with a mix of subsidies and private sector investments to advance access to LPG for cooking, solar power systems for 5m homes as planned, and rapidly scale renewable mini-grids for education, agriculture, and health sectors. Investments should be delivered under a standardization framework considering accountability and value for money.

To ensure a sustainable, climate-safe, and more resilient future, significant investments need to flow into an energy system that prioritizes renewables, electrification, efficiency, and associated

energy infrastructure. Renewable energy, which includes wind, solar, biofuels, and other renewables, remained the largest sector in investment terms.

4.5.1 Renewable Energy

There is a need to integrate renewable energy (solar, in particular) into the country's energy mix. Investment in renewables is cost-effective, powers sustainable economic growth, and creates jobs while achieving global climate and sustainable development objectives. The lack of grid power has been a setback to the growth of Nigerian businesses at an average of 40%.²² This lack of grid power has hindered Nigeria's economic growth. Nigeria's renewable

energy resource potential has not been fully exploited, mainly due to the low investment levels due to several factors ranging from poor policy implementation to a lack of knowledge by the policymakers and regulators and, more specifically, the absence of an enabling environment. There are also problems around the weak national grid, which cannot wheel sufficient energy to the distribution companies.

22. <https://www.banwo-ighodalo.com/assets/resources/6cbd0c5b298daf9fe0754887c856e429.pdf>

Nigeria and Egypt recently signed a Memorandum of Understanding (MoU) to enhance bilateral cooperation in the field of electricity and renewable energy. The two countries, through the MoU, will provide technical support for the electricity generation sector, the development of electricity transmission and distribution networks, and the transition to smart grid systems.²³

Switching over to the utilization of renewable energy resources in Nigeria is long overdue because of the increased recognition of the contribution renewable energy makes to rural development, lower health costs (linked to reduced-air pollution), energy independence, and climate change mitigation. The development of renewable energy sources opens up the prospect of increasing the indigenous energy supply, thereby contributing to greater self-sufficiency. It also creates new options to respond to the energy requirements of the rural, industrial, transport, domestic, and other sectors in accordance with national goals and priorities and provides for a more diversified and decentralized pattern of energy supply. There's an ambitious plan to provide solar systems to five million homes, and this might be a great signal towards a sustainable energy mix. Focusing on seeking other alternative energy means, such as offshore wind, biogas, and small hydropower systems, can also be very important.



23. <https://leadership.ng/accelerating-energy-transition-with-best-technology/>

4.5.2 Nigeria Gas Flare Commercialization Program (NGFCP)²⁴

The NGFCP, initially launched in 2016, was relaunched in 2022 as one of the government's initiatives to drive the attainment of zero routine gas flaring by 2035 and zero emissions by 2060. The NGFCP was launched to drastically reduce gas flaring and convert flared gas to economic use. The NGFCP aims to help Nigeria leverage its position as one of the world's largest gas reserve holders and support the country's commitment to international agreements on climate change. It is also an opportunity to attract major investment in economically viable gas flare capture projects whilst permanently addressing the environmental problem in Nigeria. This is expected to reduce carbon emissions by about 13 million tons of CO₂e annually, generating about U.S. \$1 billion per annum in revenues and creating 300,000 direct and indirect jobs.

If NGFCP is efficiently implemented, it could create many opportunities for various players in Nigeria's petroleum sector. It could be an opportunity for investors to play an active role in Nigeria's gas market by converting gas that would have been flared to commercial use. Likewise, investors will be able to enter into bankable gas supply arrangements. It can also be a source of revenue for the government by ensuring a more stable gas supply.



The NGFCP aims to help Nigeria leverage its position as one of the world's largest gas reserve holders and support the country's commitment to international agreements on climate change. It is also an opportunity to attract major investment in economically viable gas flare capture projects whilst permanently addressing the environmental problem in Nigeria.

²⁴. <https://ngfcp.nuprc.gov.ng/about-ngfcp/>

4.5.3 Low-Carbon Energy Solutions

Low-carbon energy solutions are technologies and practices that produce or use energy with minimal greenhouse gas emissions. Adopting clean technologies such as electric vehicles and stoves is a necessary investment strategy in the energy transition. However, given the significant population living in poverty today, research on low-carbon energy solutions for low-income households is needed, especially in the rural and peri-urban areas of Nigeria, to identify appropriate and affordable low-cost technologies.

Switching from using dirty fuels (kerosene, charcoal, and diesel) to Liquefied Petroleum Gas (LPG) for cooking, biogas with personal home biogas digesters, community biogas digesters, and electric alternatives will significantly reduce carbon emissions as well as generate jobs for citizens. In fact, a combination of solar systems, renewable mini-grids, and access to LPG for cooking should be the critical focus for the government in engendering equity in Nigeria. Nigeria can set low-hanging fruits here, and this will stimulate community interest in the energy sector. Low-carbon energy solutions are essential for mitigating climate change, enhancing energy security and resilience, creating new economic opportunities, and improving public health. Also, they can enhance energy security and independence and help create new economic opportunities and jobs.



In fact, a combination of solar systems, renewable mini-grids, and access to LPG for cooking should be the critical focus for the government in engendering equity in Nigeria.



4.5.4 Establishing Public-Private Partnership Investment

Private sector to make better investment decisions and avoid loss-making projects, taking advantage of public sector expertise in project selection, monitoring, evaluation, and capacity development. Investment in infrastructure by the government can also support the integration of new technologies, including in electricity grids, charging stations, public transport, broadband, and urban planning, etc., emphasizing the importance of public investment in low-carbon infrastructure. The possibility to adopt the newest and most innovative technologies is now a critical factor in attracting public-private partnership investments. The role of the public-private partnership cannot be overemphasized in promoting energy infrastructure investment to stimulate energy transition.

The entire ETP must be layered on the private sector participation. Rather than excessive dependence on multilateral funding and grants, bankable projects with well-developed pricing structures need to be developed as this is the only pathway to achieving its lofty goals. ETP should also provide the strategy in providing subsidies for solar power systems, clean cooking solutions, LPG, and also mini-grids, especially for low-income neighborhoods with minimal energy requirements.



The possibility to adopt the newest and most innovative technologies is now a critical factor in attracting public-private partnership investments. The role of the public-private partnership cannot be overemphasized in promoting energy infrastructure investment to stimulate energy transition.



4.5.5 Captive Renewable Power for Health & Education

Off-grid renewable energy solutions present a key opportunity to provide clean, reliable, and cost-effective electricity to rural health centers, which can dramatically transform the quality of healthcare services. There are a plethora of solar-backed systems in healthcare that can easily be deployed to strengthen service delivery at the healthcare value chain. An increasing array of innovative medical devices are designed to use low-voltage, direct-current power supplied by solar photovoltaic systems. These include solar direct drive vaccine refrigerators and battery-operated and portable fetal dopplers. These technologies are proving useful in environments where access to the grid is limited and where on-site generation is solar or battery-powered.

There is a need for adequate collaboration and cooperation between the health, education, and energy sectors to harness the enormous potential of clean energy to improve energy access for healthcare facilities. Government can tailor investment in this direction to ensure energy-efficient medical equipment lands in communities and health facilities that are more likely to suffer from power intermittencies.

The federal government has started the Energizing Health and Education programs that provide mini-grids to universities and hospitals. This is a commendable initiative and needs to be rapidly scaled. However, concerns about quality service delivery and evaluation methodology remain, and the government must ensure that there's value for money through these investments.



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5.0

Effect of Energy Transition on the Niger Delta Region





The Petroleum Industry Act (2021) provides for certain funds to address specific lingering and potential issues in Nigeria's oil and gas industry. These include the Host Community Trust Fund to address host community developmental issues.

The state of oil-related environmental issues in the Niger Delta region cannot be far from an environmental nightmare. Oil exploration in Nigeria has had severe environmental and human consequences for the indigenous people in oil-producing communities. The social and environmental cost of oil production has been extensive and include the destruction of wildlife and biodiversity, loss of fertile soil, air and water pollution, farmland degradation, and damage to the aquatic ecosystem, all of which have caused serious health problems for the inhabitants of the area surrounding oil production.

In essence, the energy transition puts a clock on oil and gas-funded interventions and environmental remediation in the region. The Petroleum Industry Act (2021) provides for certain funds to address specific lingering and potential issues in Nigeria's oil and gas industry. These include the Host Community Trust Fund to address host community developmental issues, the Decommissioning and Abandonment Fund to address the termination of oil and gas projects, and the Environmental Remediation Fund to address pollution-related issues. These funds, financed by payments from oil and gas firms operating in the regions, will be threatened as oil revenues dwindle in the coming years. These are in addition to other intervention instruments, such as the Niger Delta Development Commission, which receives funding from oil proceeds. With limited oil and gas revenues, the country would have to find alternative methods to finance interventions in the Niger Delta.

In addition, sub-national governments in the Niger Delta region depend heavily on oil and gas revenue. First, all the states in the region depend on FAAC allocation



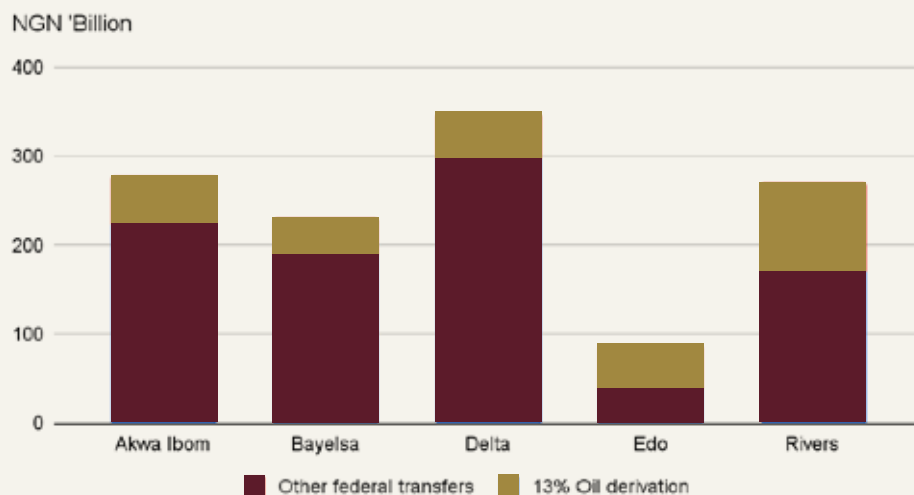
70%

First, all the states in the region depend on FAAC allocation for most of their revenues, with only Rivers State having less than 70% of revenues attributed to federal transfers.

for most of their revenues, with only Rivers State having less than 70% of revenues attributed to federal transfers. In 2021, Edo, Delta, Cross River, Akwa Ibom, and Bayelsa States respectively obtained approximately 72%, 75%, 76%, 84%, and 91% of total revenues from FAAC allocation. Furthermore, with the exception of Cross River State, a substantial portion of FAAC allocations consists of 13% oil derivation funds to oil-producing states. Between January and December 2022, derivation funds accounted for 43% of FAAC allocation received by Edo State. With the

exception of Cross River, which receives no derivation funds, Edo is the state with the least dependence on 13% derivation funds for its revenue. Rivers State’s FAAC allocation consists of 63% oil derivation funds, while Akwa Ibom, Bayelsa, and Delta States respectively acquired 80%, 82%, and 85% of their FAAC allocation from 13% oil derivation funds (figure 5). Evidently, a shock to oil revenues will constitute significant fiscal instability for these states.

Figure 5: Dependence of Niger Delta States on 13% oil derivation fund



Data Source: National Bureau of Statistics. Distribution of revenue allocation to state governments by Federal Accounts Allocation Committee (January to December 2022)



The government needs to aggressively promote the adoption of renewable energy in these communities, raising awareness on a community level and stimulating engagement and participation in energy transition agenda-setting processes.

There needs to be serious conversation regarding how the environmental and socio-economic damage sustained by communities in the Niger Delta region because of oil and gas exploration will be remediated in the face of oil revenue shortfall due to the impending energy transition. More so, this important element appears to be ignored by the country's energy transition plan, an erroneous oversight that needs to be corrected urgently to avoid problems that may encumber Nigeria's transition process.

Should the energy transition succeed, what alternatives are placed before community members whose livelihoods are now dependent on crude oil extraction and local refining? How will the move from fossil fuel to cleaner energy affect oil-producing communi-

ties? There has been a lingering lack of awareness of the negative impact of oil exploration amongst communities, which should not be repeated in the energy transition. The government needs to aggressively promote the adoption of renewable energy in these communities, raising awareness on a community level and stimulating engagement and participation in energy transition agenda-setting processes. The training and awareness should include all members of the community, especially women and young people. A better understanding of what energy transition entails and its benefits which supersede fossil fuels use will push community members to demand and engage in inclusive and just energy transition.

An aerial photograph of a multi-lane highway. A white tanker truck is driving on the road. The highway is bordered by a metal guardrail. In the background, there is a dense forest of tall, thin trees. The text '6.0' is overlaid in large white font, and below it, the question 'How should Nigeria respond?' is written in a smaller white font.

6.0

How should
Nigeria respond?

Responsible Public Spending	Efficient use of public resources to pilot climate-smart initiatives with optimization of current oil revenues to new initiatives for private sector partnerships.
Take Advantage of Natural Gas Markets	Aggressively grow the gas market with foreign debt raises for equity component and expand opportunity for gas trains and distribution infrastructure.
Aggressively Build the Metals and Minerals Sector	Develop the solid minerals sector to take advantage of the opportunities available, especially the vast majority of mineral resources across the country that can be tapped to enhance fiscal sustainability and economic growth and development. Mining should also consider sustainable environmental practices under a strong labor framework.
Human Resource and Skills Development	Upskill the Nigerian bureaucracy to fully participate in the energy transition program and also develop a skill development plan for sustainable energy jobs and also EV development in Nigeria.
Social Protection	Center energy transition plans on social equity and inclusion to ensure local communities are also engaged and supported, especially people to be significantly affected by dwindling fossil fuel earnings.
Infrastructure Development	Identify the necessary infrastructure that will be strengthened to improve economic trade and development. This will include extensive road rehabilitation and maintenance, expanded digital connectivity, investment in water treatment facilities, irrigation improvements, ecological infrastructure, and access to modern energy services.



6.1 Responsible Public Spending



Similarly, the Net Zero Emissions by 2050 scenario proposes more ambitious emission reduction targets with steeper consequences for oil demand. If these were to be implemented, it would imply a shorter period for using ICE vehicles, even in Nigeria.

As a matter of urgency, the country should prioritize the efficient use of existing resources as the door to an increased response to the climate crisis is still wide open. In its roadmap to Net Zero emissions, the IEA recommends that global ICE car sales be limited to no later than 2035 to limit cumulative emissions from cars sold in the next decade to 1.7 Gt CO₂. Similarly, the Net Zero Emissions by 2050 scenario proposes more ambitious emission reduction targets with steeper consequences for oil demand. If these were to be implemented, it would imply a shorter period for using ICE vehicles, even in Nigeria. It also means a shorter period to enjoy crude oil proceeds. While this may be an overstretch to responding

to the climate crisis given the various policy, socio-economic and political obstacles that may arise from its implementation, it is not dismissable as increasing manifestations of climate change-related weather events could create the right conditions to sway action towards more ambitious targets by several governments. More so, as initial targets are increasingly met by more countries, pressure to drive harder and the country's lethargy to respond to climate goals may increase. All of these imply that the sooner the country improves public spending efficiency, the better for its economy and people. Oil revenues had better be optimized while they are still available.





6.2 Take Advantage of Natural Gas Markets



78%

The Asia Pacific region is expected to record the largest growth, jumping by 78% to 1,620 billion cubic meters (bcm). Other regions expected to record an increase in natural gas demand are the Middle East, Eurasia, Africa, and Latin America, adding 60%, 23%, 152%, and 100%, respectively

Natural gas retains significant opportunities that can benefit Nigeria's revenue stream. Although natural gas demand, especially in Europe, is projected to slow down between 2021 and 2025 as a result of the Russia-Ukraine crisis, according to the IEA,²⁵ the Gas Exporting Countries Forum (GECF)²⁶

projects that over the long term, global natural gas demand would rise by 36% by 2050. The Asia Pacific region is expected to record the largest growth, jumping by 78% to 1,620 billion cubic meters (bcm). Other regions expected to record an increase in natural gas demand are the Middle East, Eurasia, Africa, and Latin America, adding 60%, 23%, 152%, and 100%, respectively (figure 6). While in North America, natural gas demand is expected to peak by the early 2030s before declining to near 2021 levels by 2050. Europe's natural gas demand is expected to continuously decline over the next three decades, dropping by 37% compared to 2021 levels.

Power generation will account for the largest share of natural gas demand

growth, representing 44% of total growth. Nigeria presently reports natural gas reserves of nearly 200 trillion SCF, with the potential to triple that amount if concerted efforts are made at exploration. Consequently, Nigeria's priority of natural gas as a transition fuel, as expressed in its ETP, is certainly a wise move. Again, Africa's regional markets, especially the South of the Sahara, are low-hanging fruits that the country can benefit from in addition to its local gas market. The Asia Pacific region retains the largest rise in volumes and can also be a lucrative market for Nigeria's natural gas. In the last quarter of 2022, natural gas accounted for 11.1% of total exports amounting to N704.88bn in trade. There is room to improve this as gas can be a major revenue source for Nigeria in the decades to come.

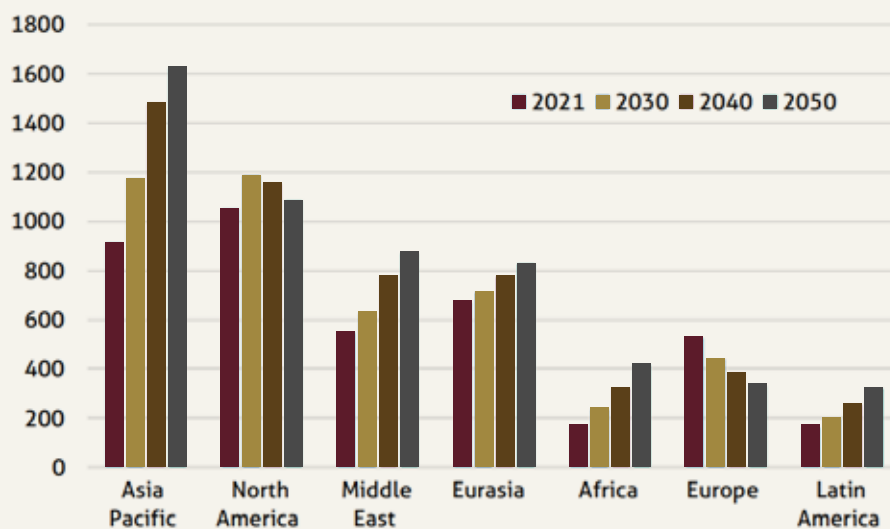
Following the current crisis between Russia and the rest of Europe and how they want to sever their dependence on Russian oil, natural gas from diversified sources has been of interest. Qatar plans to increase its liquefied natural gas production capacity to 126 million metric tons/year (mmt) from current levels of

25. IEA. Gas Market Report Q3-2022. Available at <https://www.iea.org/news/global-natural-gas-demand-set-for-slow-growth-in-coming-years-as-turmoil-strains-an-already-tight-market>
26. Gas Exporting Countries Forum. Global Gas Outlook 2050. Available at <https://www.gecf.org/insights/global-gas-outlook?d=2023&p=1>

77 mmt by 2027. Qatar is already locked in a 27-year gas deal with China worth \$60bn, and a 15-year deal to buy 2 million tonnes of liquid gas with German firms, with deliveries expected in 2026. Nigeria's NLNG six-train production has a capacity of 22 million metric tons/year of LNG, and current plans for train 7 are expected to lift Nigeria to 30 million

metric tons/year. If gas represents Nigeria's energy transition plan, Nigeria needs to be more bullish with investment in NLNG trains and also accelerate investments in the Trans Saharan gas pipeline, with the annual capacity of the pipeline being up to 30 billion cubic meters of natural gas.

Figure 6: Global natural gas demand trends by region (bcm)



Source: Global Exporting Countries Forum



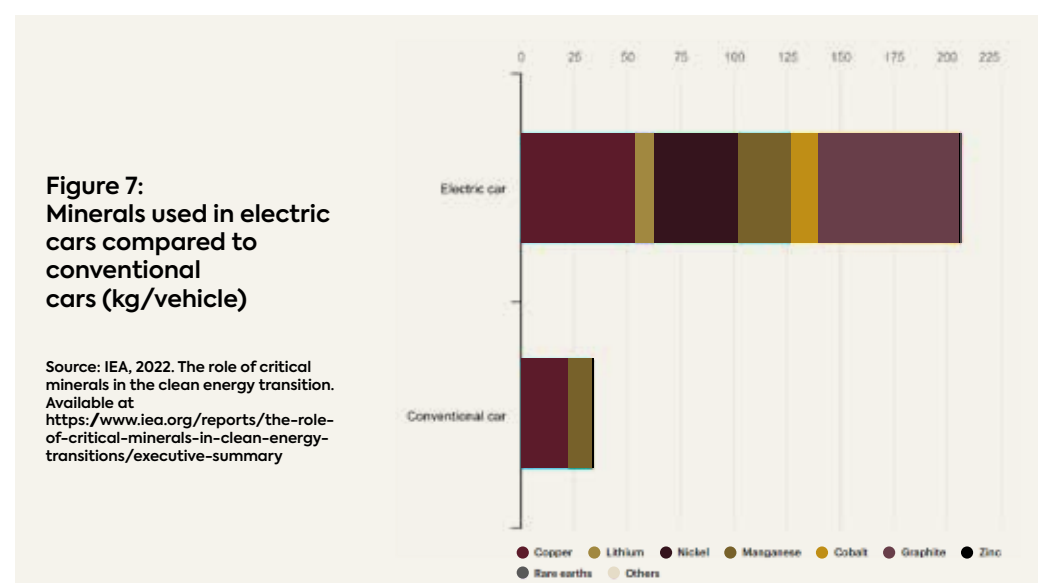
6.3 Aggressively Build the Metals and Minerals Sector



For example, aluminum's lightweight and high strength makes it suitable for applications in the automobile and aerospace industries. This high strength-to-weight ratio is useful for achieving higher efficiency while conserving more fuel, an important feature for EVs.

Nigeria is blessed with numerous natural resources beyond oil and gas to various metals and minerals. As the world transitions to a green economy, solid minerals and metals are key to ensuring the transition is successful. For example, aluminum's lightweight and high strength makes it suitable for applications in the automobile and aerospace industries. This high strength-to-weight ratio is useful for achieving higher efficiency while conserving more fuel, an important feature for EVs. It is also used for manufacturing renewable energy equipment such as windmills. Copper is a very efficient conductor of electricity,

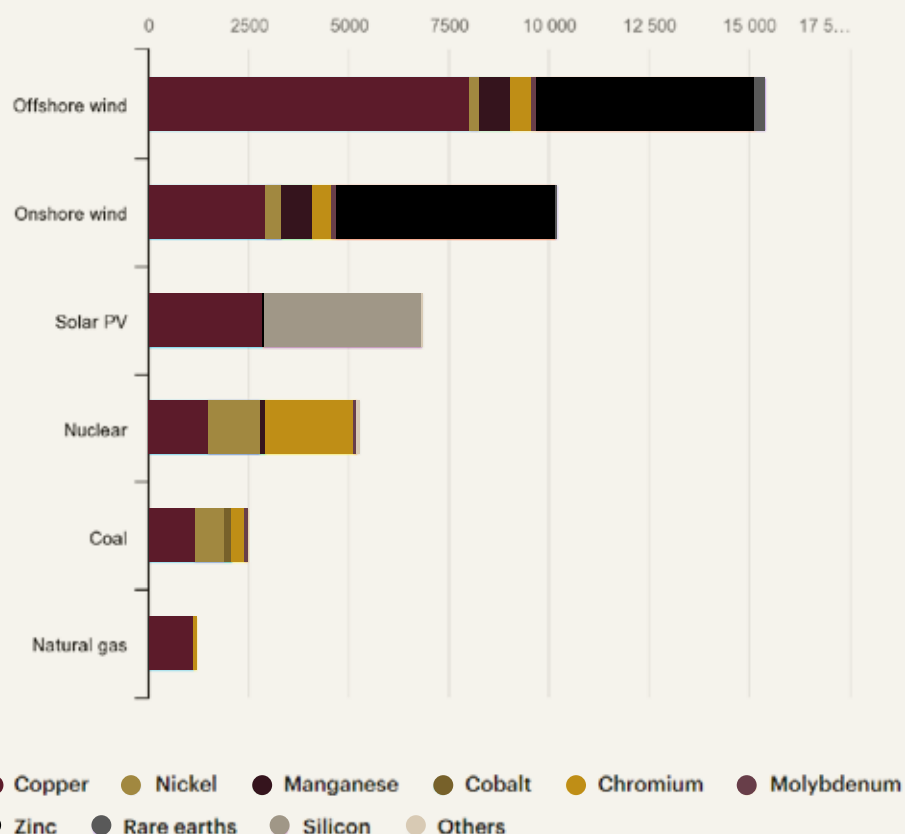
providing most of the electronic parts in EVs. Lead is the major element for producing lead acid batteries used for battery storage applications, an important criterion for renewable energy technologies, such as solar and wind, which utilize battery storage as backup for periods of intermittency or unavailability of supply. Other metals and minerals critical to the energy transition include Cobalt, Nickel, and Lithium. These minerals used in EVs and clean energy technologies outpace consumption in conventional cars and methods of power generation, as seen in Figures 7 & 8 below.





Similarly, the IEA projects that by 2040, demand for minerals, due to the rapid deployment of clean energy technologies, would rise by at least double under the most modest scenarios and as much as six times under a Net Zero by 2050 scenario.

Figure 8: Minerals used in clean energy technologies compared to other power generation sources. (Kg/MW)



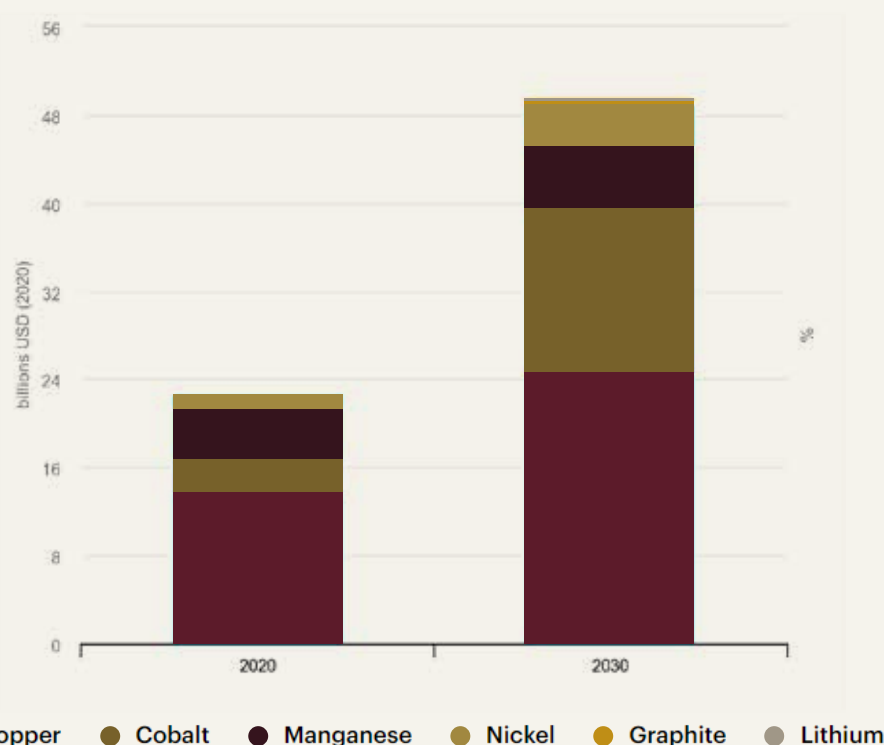
Source: IEA, 2022. The role of critical minerals in the clean energy transition. Available at <https://www.iea.org/reports/the-role-of-critical-minerals-in-clean-energy-transitions/executive-summary>

Consequently, demand for these metals is projected to increase between now and 2050. As of October 2022, Fitch rating²⁷ projected a six-fold increase in demand for minerals by 2050 compared to current levels, driven mostly by electric vehicles and renewable energy uptake. Similarly, the IEA projects that by 2040, demand for

minerals, due to the rapid deployment of clean energy technologies, would rise by at least double under the most modest scenarios and as much as six times under a Net Zero by 2050 scenario.²⁸ Also, revenues from copper and other minerals could double by as early as 2030.²⁹

27. See "Energy transition boosts global long term demand for metals". Fitch wire (Online). Available at: <https://www.fitchratings.com/research/corporate-finance/energy-transition-boosts-global-long-term-demand-for-metals-05-10-2022>
 28. See "The role of critical minerals in clean energy transitions. International Energy Agency. Available at: <https://www.iea.org/reports/the-role-of-critical-minerals-in-clean-energy-transitions/executive-summary>
 29. See "Africa Energy Outlook 2022". International Energy Agency. Available at <https://www.iea.org/reports/africa-energy-outlook-2022>

Figure 9: Revenue from copper and battery metals in Sub-Saharan Africa in the sustainable Africa scenario 2020-2030



Source: International Energy Agency, Africa Energy Outlook 2022



1%

A lot of clarity on the sector can be facilitated by the government through the ministries of mines and steel to promote improved uptake of solid minerals up from the present level of 1% of GDP.

It would benefit Nigeria to develop its solid minerals sector to take advantage of the opportunities available. The vast majority of mineral resources across the country can be tapped to enhance fiscal sustainability, economic growth, and development. This would involve sufficient investment to generate accurate seismic data regarding locations and quantities of reserves. At present, while there is evidence regarding the presence of many mineral resources across Nigeria, including the aforementioned, details regarding their commercial viability are somewhat hazy. A lot of clarity on

the sector can be facilitated by the government through the ministries of mines and steel to promote improved uptake of solid minerals up from the present level of 1% of GDP.³⁰

While it's pertinent for Nigeria to increase mining in transition metals required for the future of energy, it must also ensure that such practices are done sustainably, do not significantly degrade the environment, and includes remediation efforts. Mining should be done under healthy labor practices as part of a social justice element of the energy transition plan.

30. Central Bank of Nigeria. 2021 Statistical bulletin- Real Sector. Gross Domestic Product at current base prices.



6.4 Human Resource and Skills Development

One very important sector to put into consideration is the Skills Development sector. There is a need for the development of skills for a just energy transition and the future of work to ensure that adequate skills are in place to match the growth in new clean sectors and support workers' transition. For example, the South African government has stated that there will be adequate reskilling and upskilling of the current workforce and education of

future ones, ensuring they are better equipped to navigate the transition. The Nigerian government needs to identify skills analysis to identify demand, set up substantive short and longer-term training programs, the recognition of prior learning, the promotion of just energy transition labor market policies, the creation of new job opportunities, especially with lower levels of foundational skills, digital innovation, and more.



The Nigerian government needs to identify skills analysis to identify demand, set up substantive short and longer-term training programs,





6.5 Social Protection



The energy transition interventions can also be anticipatory in fostering new opportunities for specific groups like the youth and future generations, particularly through new employment in green and emerging clean technology areas.

A just energy transition puts people at the center of decision-making, especially those most impacted, the poor, women, people with disabilities, and the youth—empowering and equipping them for new opportunities of the future. The energy transition interventions can also be anticipatory in fostering new opportunities for specific groups like the youth and future generations, particularly through new employment in green and emerging clean technology areas, local

communities who may bear the brunt of environmental and social externalities, induced by the coal phasedown or the shift away from other fossil fuels, those currently excluded from the existing structure of the economy (due to education, gender, race, or disability).





6.6 Economic Diversification



It is also imperative that interventions are proposed to identify growth areas in local markets based on actual potential and nurture their development.

Nigeria still needs a more detailed plan to show that necessary infrastructure will be strengthened to improve economic trade and development, this will include extensive road rehabilitation and maintenance, expanded digital connectivity, investment in water treatment facilities, irrigation improvements, ecological infrastructure, access to modern energy services, informal settlement upgrading and sustainable housing. This is to ensure

that the foundation of the necessary infrastructure is in place to attract and retain new businesses and talent and enable new investments in emerging productive sectors. It is also imperative that interventions are proposed to identify growth areas in local markets based on actual potential and nurture their development. This may include incubators, accelerators, and early-stage ventures to create next-generation opportunities and entrepreneurs.





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