



The Nigerian Energy Crisis: What Prospects for Green Recovery and Transatlantic Integration?¹

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Introduction

With a population of approximately 200 million, Nigeria accounts for about half of West Africa's population and has one of the largest concentrations of young people in the world. Endowed with abundant natural resources, Nigeria is one of Africa's largest oil exporters, with an estimated 37 billion barrels² of proven crude oil reserves, the majority of which are found in the Niger River Delta and offshore in the Bight of Benin, the Gulf of Guinea and the Bight of Bonny. Nigeria also has the largest natural gas reserves on the continent, estimated at 5.4 trillion cubic meters³ at the end of 2019. In addition, the country has a large amount of renewable energy resources, including hydropower, solar, wind, and biomass. The total exploitable potential of hydropower is estimated at over 14,120 megawatts⁴ (MW), the mean daily solar radiation is about 5.25-kilowatt hours/square meter (kWh/m²) per day⁵, wind energy varies between 2.0 and 8.0 meters per second (m/s)⁶, and biomass amounts to 144 million tons per year⁷.

Yet Nigeria faces a structural energy crisis, with frequent power supply interruptions, dilapidated energy infrastructure, and heavy dependence on oil. These challenges have resulted in low access to electricity. Available statistics paint a bleak picture. Currently, only 53% of the Nigerian population has access to grid electricity⁸. Nigeria's electricity consumption per capita is also among the lowest in Africa. Nigerians consumed just 0.2 MWh per capita⁹ in 2018, which represents 5% of what South Africans consumed on average in the same year. Also, Nigeria recorded the highest level of power outage duration in Africa, amounting to 4,600 hours in 2018. According to the World Bank, the economic cost of power outages in Nigeria is estimated to be about \$28 billion, equivalent to 2% of its GDP on average¹⁰.

Nigeria emerged from a recession in 2017, with a growth rate of 0.8%¹¹, driven mainly by the oil sector. Non-agricultural growth, which remained negative up to the third quarter of 2017, strengthened through 2018 with services resuming as the key driver. Economic growth held just above 2% in 2019, but dropped to -3.2% in 2020¹² due to the COVID-19 pandemic, sending the country into another recession. The latter has only exacerbated the structural challenges that Nigeria has faced for several years, particularly in the energy sector, and shows its vulnerability to exogenous shocks. This underscores the urgency of transforming the Nigerian energy sector by addressing lingering issues, further diversifying the energy mix, and putting in place an enabling policy and regulatory framework conducive to such change, in order to reduce dependence on oil and increase the resilience and sustainability of the energy sector.

This paper takes an introspective look at the Nigerian energy sector. First, it explores the key persistent challenges to the development of a resilient and sustainable energy sector. Second, it analyzes the immediate implications of the COVID-19 pandemic on the three energy industries, namely the oil and gas industry, the renewable energy industry, and the power sector. Third, it

² British Petroleum (BP). 2020.

³ Ibid.

⁴ International Hydropower Organization. 2018.

⁵ Abam et al. 2014.

⁶ Ibid.

⁷ Ben-Iwo et al. 2016.

⁸ The World Bank, 2020a.

⁹ International Energy Agency, 2020b.

¹⁰ The World Bank, 2020a.

¹¹ The World Bank. 2020b.

¹² International Monetary Fund. 2021.

contributes to the discussion on the prospects for a green recovery in Nigeria and the importance of strengthening transatlantic cooperation.

1 Nigeria's Energy Crisis

Nigeria is facing a persistent energy crisis. Its energy industry is considered one of the most inefficient in meeting the needs of its customers globally, despite the country's enormous energy resources. Underutilization of these resources is rampant and is exacerbated by a chronic imbalance in the electricity and petroleum products markets. Nigeria also suffers from oil-related militancy, which has led to the vandalization of gas and oil pipelines in the Niger Delta region, further aggravating energy supply shortages. This situation has threatened energy security and harmed the Nigerian economy. It resulted in increased income inequality and energy poverty, a weakening of the industrialization process, and the undermining of efforts to achieve sustained economic growth. While the causes of this energy crisis are multiple, the literature provides an overview of the main ones, which are discussed in the following section.

1.1 The Overreliance on Oil and Volatility of Oil Prices

Since the discovery of oil resources in 1956, the oil sector has gradually gained considerable importance and become the main driver of the Nigerian economy. Oil is the country's leading export item, accounting for an average of 90% of total exports during the 2010-19 period¹³. It is thus the main provider of foreign exchange reserves and tax revenues for the federal government (Figure 1). Despite its importance, the oil sector has not broadened the productive base of the Nigerian economy. Its oil industry contributes less than 10% of Nigeria's GDP: 9% in 2018 and 7% in 2019 (Figure 2) and is not very labor-intensive. While precise figures on employment in the oil sector in Nigeria are scarce, estimates from the International Labor Organization (ILO) states that the oil industry creates over 65,000 direct jobs in Nigeria, and more than 250,000 jobs in non-direct employment¹⁴, whereas the service sector, as a comparison, employs roughly 30.6 million jobs¹⁵.

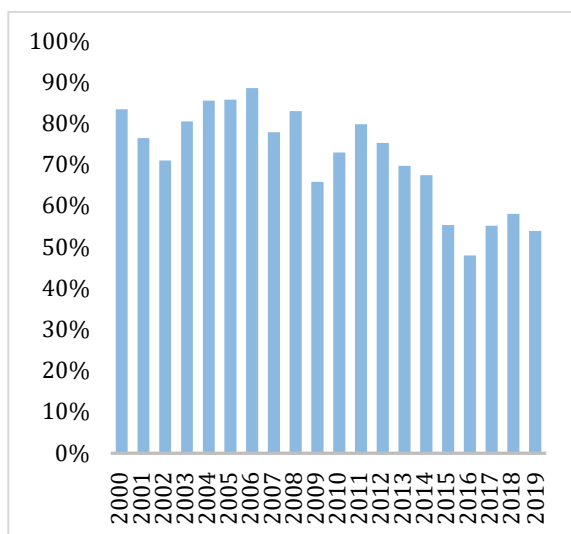
This precarious dependence on the crude oil sector has been blamed for the abysmal performance and retarded growth of other sectors like manufacturing and agriculture. It has also been detrimental to economic growth itself, as the price of crude oil in the international market is highly volatile. Oil price volatility engenders, indeed, uncertainty and macroeconomic volatility, which adversely affects investment, economic growth, and other key macroeconomic variables, thus leaving Nigeria vulnerable to any major crisis. For instance, the fall in oil prices in 2014 threw the country's public finance into disarray. It resulted in a drastic drop in oil revenue for the federal government, which reduced Nigeria's external foreign reserves and caused the weakening of its currency, the naira, against the dollar, which caused cost-push inflation, and resulted in a recession.

¹³ World Integrated Trade Solution. 2020.

¹⁴ Fajana. 2005.

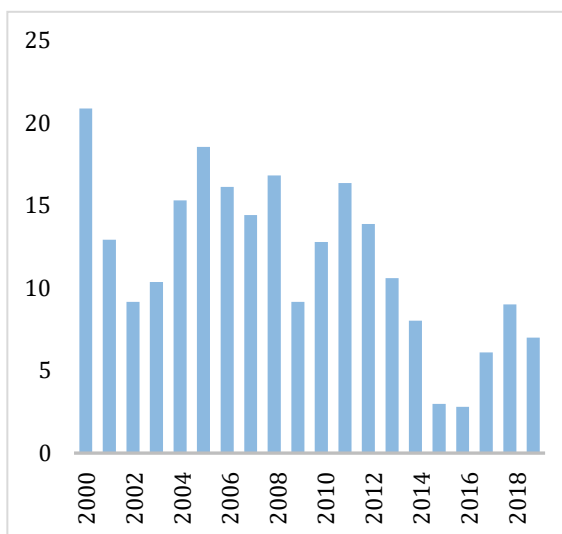
¹⁵ International Labor Organization. 2020.

Figure 1: Nigeria- Oil Revenue As A Percentage Of Total Federally Collected Revenue, 2000-2019



Source: Central Bank of Nigeria.

Figure 2: Nigeria- Oil Revenue As A Share Of GDP, 2000-2019



Source: National Bureau of Statistics of Nigeria.

Nigeria's recovery after the 2014 recession remained weak overall, with growth still lagging behind its potential and below the pre-recession levels and government targets. Real GDP growth increased slowly from a historically low level of -1.6% in 2016 to reach 2.2% in 2019, compared to an average of 6% during the 2010-14 period¹⁶. Subsequently, new investment in the oil sector has been limited due to the slow recovery, the various force majeure episodes declared by oil companies, and maintenance disruptions, which in turn limited the potential increase in production in the medium term. Barely out of the rut, the Nigerian economy has been hard hit again by the recent drop in oil prices, starting in the winter of 2020, as a result of the spread of the COVID-19 virus, which has undermined Nigeria's efforts for economic recovery post-2014.

1.2 Oil Supply Disruption and Instability in the Niger Delta Region

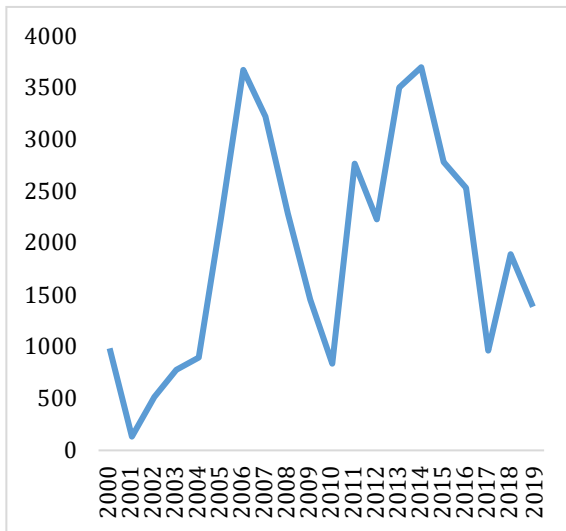
Despite its importance for the Nigerian economy, the oil sector suffers from supply disruptions, due to pipeline vandalization, incidents of illegal bunkering, and theft of crude oil. A total number of 39,350 pipeline breaks occurred between 2000 and 2019, of which 571 were occasioned by system deterioration like ruptures, and 38,779 were attributed to acts of vandalization¹⁷ (Figure 3). One of the most active insurgent groups operating in the oil-producing Niger Delta region is the Niger Delta Avengers (NDA). Since the beginning of 2016, the NDA has conducted many attacks on oil and natural gas infrastructure throughout the region, which resulted in immediate and severe disruptions in crude oil production, as some of the attacks have targeted key oil-gathering and export infrastructure. These attacks took place while Nigeria was in an economic recession following the 2014 drop in oil prices, which further decreased crude oil production (Figure 4). As a result, crude oil disruptions, reached 750,000 barrels per day (b/d)¹⁸ by May 2016.

¹⁶ The World Bank. 2020c.

¹⁷ Nigerian National Petroleum Corporation (NNPC), 2019.

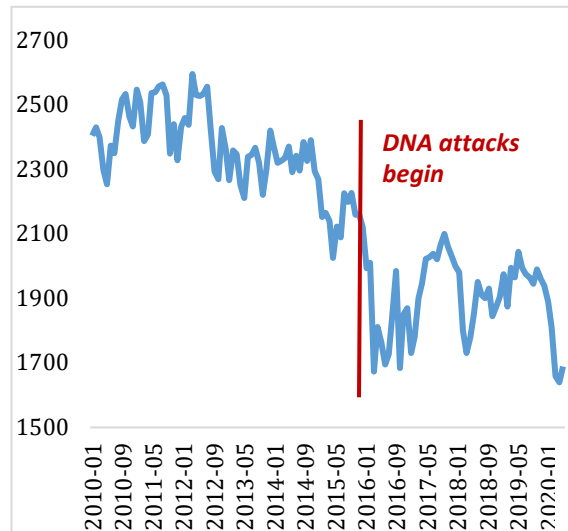
¹⁸ US. Energy Information Administration (US EIA). 2020a.

Figure 3: Nigeria- Yearly Number Of Pipeline Vandalization Incidents, 2000-2019



Source: NNPC.

Figure 4: Nigeria- Monthly crude oil including lease condensate production, thousand barrels per day



Source: US Energy Information Administration.

Besides vandalization incidents, several oil companies have declared a force majeure throughout the years, meaning the companies are released from export obligations as a result of circumstances beyond their control. In 2018 for instance, outages at key pipelines supplying Forcados and Bonny Light grade crudes were out of commission. In particular, the shutdown of the Nembe Creek Pipeline in mid-May 2018, which transports 150,000 b/d of Bonny Light to the Forcados terminal, caused Shell Petroleum Development Company of Nigeria to declare a force majeure on Bonny Light crude exports. This shutdown has, in conjunction with the closure of the leaking Trans-Forcados pipeline, which transports 200,000-240,000 b/d, led to further delays and an accumulation of unsold crude. These factors caused Nigeria’s oil production to drop by 150,000 b/d from 1.9 million b/d in April 2018, to 1.8 million b/d in May and 1.7 million b/d in June of the same year¹⁹.

1.3 The Issue of Gas Flaring

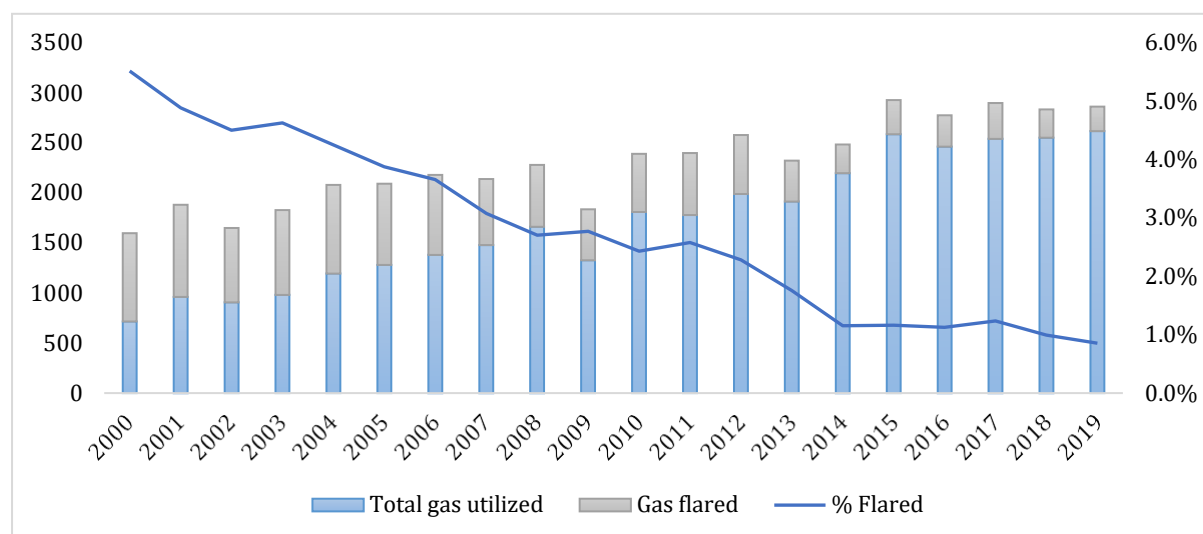
Besides oil, Nigeria has the largest gas reserves in Africa and the 10th largest in the world as of 2019. Yet gas production remains very low and unstable. Indeed, despite rapid growth since 2000, gas production has slowed down due in part to regulatory uncertainties, which the country is still trying to curb to this day. Shortages of domestic gas supply have also severely affected the reliability of the power supply, leading to load shedding and growing reliance on private diesel-based generators. Exports via the West African Gas Pipeline have also been subject to frequent interruptions, which has caused difficulties for neighboring countries such as Ghana, Benin, and Togo²⁰. Another acute challenge facing Nigeria’s gas industry is gas flaring, which is defined as “the controlled burning of natural gas that cannot be processed for sale or use because of technical or economic reasons”²¹.

¹⁹ US EIA, 2020b.

²⁰ International Energy Agency (IEA), 2019a.

²¹ Emam, 2015.

Figure 5: Nigeria- Yearly Gas Utilization in billion cubic feet (Bcf) And Gas Flared As A Percentage Of Total Gas Produced, 2000-2019



Source: NNPC.

Although Nigeria has made notable progress in reducing flaring, the country remains the seventh-largest gas flaring nation in the world. The amount of gas flared in Nigeria in 2019 reached 244.35 billion cubic feet (bcf), representing 9% of the total gas produced (Figure 5). On the economic front, gas flaring has caused significant financial losses. A recent PwC²² report monetized the effect of gas flaring on the Nigerian economy. It has been reported that Nigeria lost up to 761.61 million dollars in 2018 from gas flaring (Table 1). On the environmental front, gas flaring is a major source of greenhouse gas emissions, due to the high level of pollution in the atmosphere. It also generates noise and heat and leaves large areas uninhabitable. According to the same report, the environmental cost of gas flaring in Nigeria was estimated at 94 million dollars annually.

Table 1: Nigeria, Revenue losses from gas flaring between 2014 and 2018

	The volume of gas flared per thousand cubic feet	The average price of gas in \$ per thousand cubic feet	Revenue lost in \$
2018	282,080,000	2.70	761,616,000
2017	324,192,401	2.70	875,319,482
2016	288,917,198	2.60	751,184,714
2015	330,933,000	2.40	794,239,200
2014	393,839,836	2.50	984,599,590

Source: DPR annual report, NNPC, PwC analysis

Despite the government's goal of eliminating gas flaring by 2020, progress has stalled since 2016. Several challenges have hampered the Nigerian National Petroleum Corporation's (NNPC) efforts to end gas flaring by 2020 due to delays in the passage of several critical elements of the Petroleum Industry Bill by the legislative and executive branches, lack of adequate infrastructure, which perpetuates flaring activities as excess gas is flared due to the lack of processing and storage facilities. Besides, punitive measures for flaring in Nigeria are below optimum. The penalty for gas

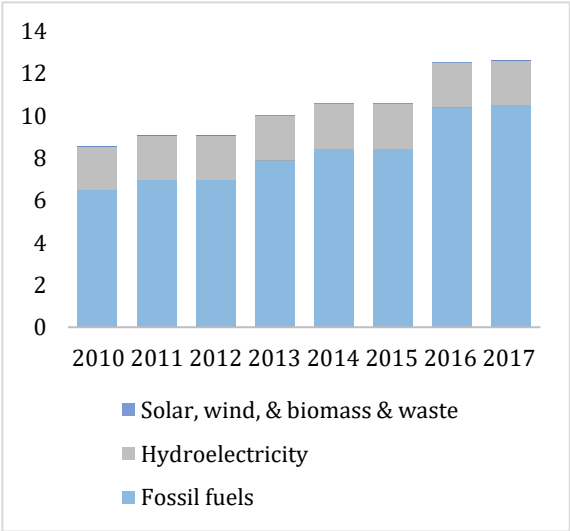
²² PwC, 2019.

flaring in Nigeria was approximately \$0.03 in 2017, meaning that the penalties are not a sufficient deterrent to offenders²³.

1.4 The Chronic Energy Infrastructure Gap

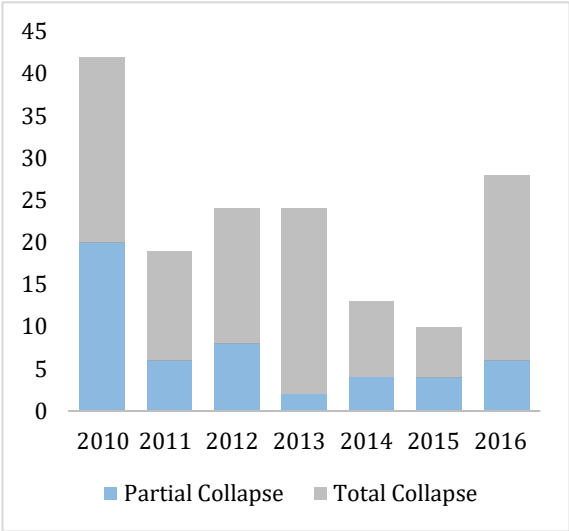
Nigeria's energy supply infrastructure has not expanded as rapidly as population growth, despite huge public expenditures, making it inadequate to meet the needs of the growing population. The development of the oil infrastructure in Nigeria has, thus, not increased the reliable connection to the power grid, leading to numerous challenges in the generation, transmission, and distribution infrastructures. In terms of generation, Nigeria's generation capacity was 12,664 MW, of which 10,522 MW (83%) was from fossil fuels; 2,110 MW (17%) was from hydroelectricity; and 32 MW (<1%) was from solar, wind, and biomass and waste (Figure 6). However, net electricity generation was far lower than capacity and stood at 3,495 MW, or about 28% of total capacity²⁴, because of internal capacity constraints, mainly maintenance and repair requirements, and irregular supply of primary fuels due to insufficient gas production, inadequate infrastructure, and frequent vandalism.

Figure 6: Nigeria- Electricity capacity by fuel type, 2008-2017, gigawatts



Source: EIA, 2020.

Figure 7: Nigeria- Number of system collapse per year, 2010-2016



Source: NESISTATS, 2020.

Regarding transmission infrastructure, Nigeria's transmission system can transmit around 5,300MW, which is above the average operational generation capacity, but well below the total installed capacity. This might create a critical bottleneck for the delivery of electricity when the operational generation capacity increases to the same level as the installed capacity. Moreover, transmission losses on the grid are high compared to emerging country benchmarks: 8% versus 2-6%, reflecting critical operational challenges. Indeed, although the number of system collapses has decreased over the last seven years from a peak of 42 in 2010 to 13 in 2014, it has increased again to 28 in 2016 (Figure 7). In terms of electricity distribution, Nigeria's distribution companies suffer significant losses, with nearly 46% of energy lost due to technical, commercial, and

²³ Ibid, 2019.

²⁴ US EIA, 2020c.

collection issues²⁵. Over \$400 million is spent by the Federal Government of Nigeria as an annual subsidy to cover losses and investment. Therefore, a combination of reduced availability and low reliability of power supply has led to the prolific growth of inefficient and costly on-site self-generation by industrial, commercial, and even residential consumers, which bears a significant environmental cost.

2 The Impact of COVID-19 on Nigeria's Energy Sector

In the Atlantic Basin, and around the world, airports, borders, and businesses were closed and people were forced to stay home as countries took steps to fight the COVID-19 pandemic. The energy sector was not spared. It fell into a deep crisis in the first half of 2020, and oil-dependent economies like Nigeria were hit severely. The implications of the COVID-19 pandemic underscored the underlying vulnerabilities of the country's energy sector discussed in Section 1 and the urgency to address them. While crude oil prices have rebounded in late 2020 and early 2021, thanks in part to rising demand in Asia, marked by an inflection in industrial production and a gradual return of production rates to pre-crisis levels, the consequences for the Nigerian economy will be felt for years to come, as was the case after the 2014 commodity price collapse. The following section analyzes the immediate impacts of the COVID-19 pandemic on the three main energy industries in Nigeria, namely oil and natural gas, renewable energies, and power and electricity.

2.1 An Oil and Gas Industry Thrown into Disarray

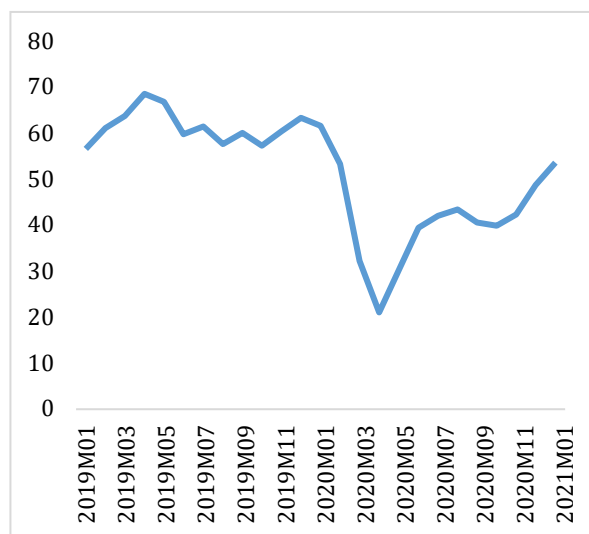
Nigeria's energy sector is highly sensitive to the macroeconomic performance of the oil and gas industry. On the demand side, both external and domestic demand for Nigerian oil and gas declined, due to the lockdowns implemented in Nigeria and its trade partners. This, combined with a price war between major oil producers, notably Russia and Saudi Arabia, had led to a sharp drop in crude oil prices (Figure 8). As a result, Nigeria's crude oil exports declined by 36% between 2019 and 2020²⁶ (Figure 9). On the supply side, in line with the global production cut strategy adopted by the OPEC+, Nigeria reduced crude oil and condensate production by 22% between July 2019 and July 2020 (Figure 10). Nigeria's gas production also experienced a drop, although less significant than that of crude oil (Figure 11).

Furthermore, Nigeria has not been able to sell its excess production during the months following the lockdowns, which led to an oversupply: between March and May 2020, Nigeria had over 50 stranded cargoes of crude oil and 12 of liquefied natural gas that were unable to find buyers. This has further reduced the expected profits from oil and gas sales and was aggravated by the lack of sufficient storage capacity. Moreover, international oil and gas companies, like Chevron, Shell, Total, ExxonMobil, took steps to reduce their operating costs and budgets and to re-negotiate their contracts with the NNPC in early April 2020. Upstream and downstream projects are expected to be significantly delayed as a result of scaled-back government investments, declining Foreign Direct Investments, and delays in execution due to the disruption in supply chains.

²⁵ Nigerian Electricity Supply Industry Statistics. 2020, And the Federal Government of Nigeria & Power Africa. 2015.

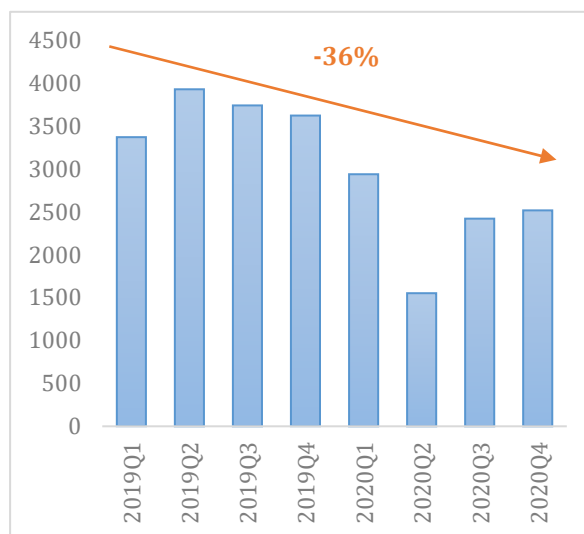
²⁶ National Bureau of Statistics of Nigeria. 2021.

Figure 8: Monthly Prices of Crude Oil, Average (\$/b) between 2018 and 2020



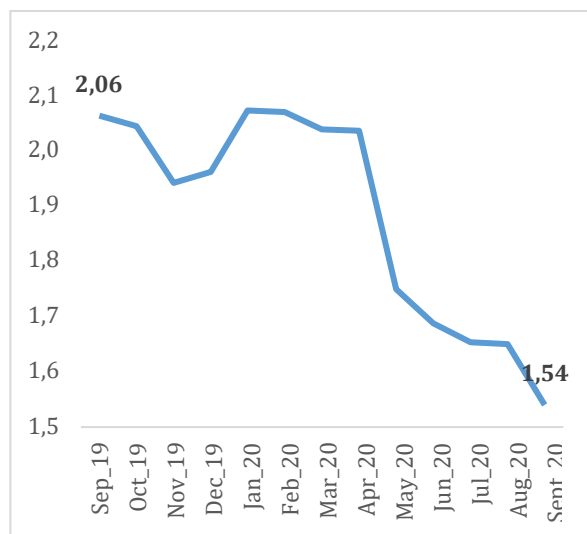
Source: World Bank Commodity Price Data

Figure 9: Quarterly Nigeria exports of crude oil, 2019-2020, billion Naira



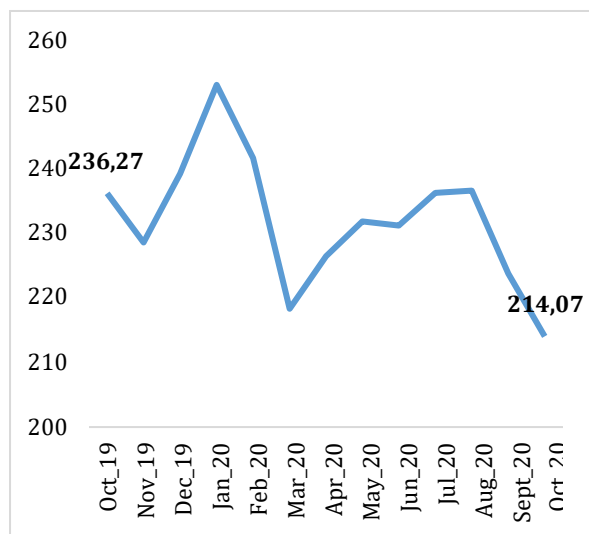
Source: National Bureau of Statistics of Nigeria.

Figure 10: Average Daily Crude Oil & Condensate Production, million b/d



Source: NNPC.

Figure 11: Monthly Nigerian Gas Production, billion cubic feet (BCF)



Source: NNPC.

These dynamics have had a detrimental effect on Nigeria’s economy given its dependence on oil exports and revenues. Having just emerged from the rut, this crisis plunged Nigeria into another period of recession. Real GDP was projected to grow at 2.2% in 2020 pre-pandemic, but this has now been revised to -3.2%²⁷. In reaction to this, the Nigerian government revised, in late March, its initial budget for 2020, by reducing the oil benchmark from \$57 per barrel to \$28 and cutting crude production²⁸. Nonetheless, Nigeria was left in a situation of dramatic revenue shortfall given its dependence on oil and gas as its main source of income. Gross oil revenues fell by 38%²⁹ between November 2019 and November 2020 (Figure 12). It is important to note, however, that

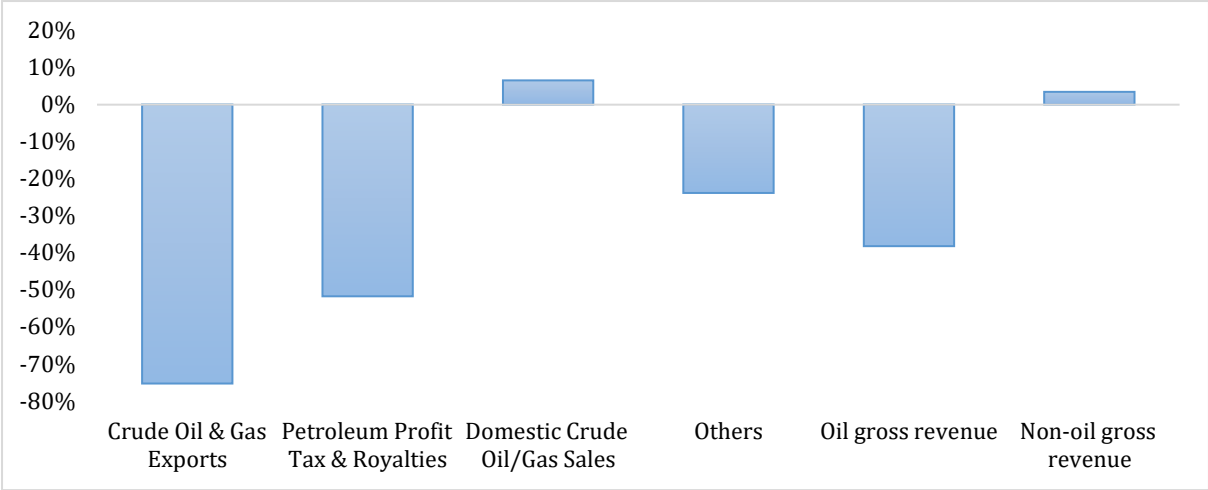
²⁷ International Monetary Fund. 2021.

²⁸ Naira Metrics. 2020.

²⁹ Central Bank of Nigeria. 2021.

crude oil prices have gradually increased from 20.04 \$/b in April 2020 to 53.6 \$/b in January 2021, almost recovering to their pre-crisis level, suggesting a less burdensome year for federal revenues in 2021. However, as evidenced by the drop in commodity prices in 2014, the impact of the current crisis will most likely be reflected in the Nigerian economy in the coming years.

Figure 12: Oil Revenue Performance, Variation between 2020Q2 and 2019Q2



Source: Central Bank of Nigeria

As the Nigerian government struggles to cope with the impact of the COVID-19 pandemic, the risk of regional insecurity in the Niger Delta region, where militant groups have proven capable of crippling oil production, raising the cost of a barrel of oil, and scaring off investors, has increased. Factors contributing to this growing threat include a potential decline in funding for the amnesty program that previously helped stem regional violence. A similar situation occurred after oil prices collapsed in 2014 and led to a militant uprising that led to a decline in oil production in 2016. Moreover, the impending recession could increase economic incentives for militancy, as the latter can be seen as remunerative, considering the monetary compensation given to fighters and compensation for oil theft and illegal refining, which in turn finances armed activity in the region. Besides, disruptions to oil supply chains are also likely to benefit pirates, as oil shipments and offshore crude production are increasingly threatened.

2.2 A Relatively Resilient Renewable Energy Industry

At the global level, renewable energy used for electricity generation, in contrast to other fuels, has shown some resilience in the face of the COVID-19 pandemic. Indeed, the renewable energy industry adapted quickly to the challenges of the pandemic, despite several supply chain disruptions and construction delays, which has slowed the progress of renewable energy projects in the first six months of 2020. According to the International Energy Agency³⁰, renewables used for electricity generation are expected to grow by almost 7% in 2020 and the net overall demand for renewable energy will increase by 1%, driven by strong growth in priority access to the grid and continuous installation of new plants.

In Nigeria, despite the COVID-19 crisis and its impacts on the economy, there has been an increased wave of government involvement, philanthropic activities, and public-private

³⁰ IEA, 2020.

partnerships in the renewable energy industry. In terms of electricity access, the African Development Bank and the Nigerian Government launched a \$200 million National Electrification Project (NEP), to address energy access deficits by channeling private sector investments into mini-grid and off-grid solutions³¹. Moreover, the Rural Electrification Agency (REA) signed grant agreements for 2 communities – Oloibiri and Akipelai Bayelsa State, with Renewvia Solar Nigeria under the Nigeria Electrification Project (NEP). The REA also announced it will supply solar home systems and mini-grids to primary healthcare and isolation centers across the country.

Nevertheless, some project negotiations for tariff reductions in the renewable energy industry might still be delayed due to restrictions in operations, pricing, and illiquidity. These include³² six 100 MW Solar projects backed by Nigerian Solar Capital Partners and others, an 80 MW solar farm backed by Novia Scotia Power Development Company, and five 50 MW facilities backed by Afrinegia Power and others. Besides, the renewable energy industry could experience an increase in capital costs in the short term due to rising financial costs and commercial constraints, resulting from limitations on global mobility, supply chain interruptions, and reduced industrial activity, which have created a shortage of green energy technologies and installation components.

Building on the relative resilience of renewable energy observed globally, Nigeria has the opportunity to continue its efforts to develop the industry, but only if it addresses the barriers that have hindered its development long before the COVID-19 crisis. These obstacles can be divided into three main categories:

- **Cost and pricing barriers:** The investment costs required for new renewable energy infrastructure requires a very high initial cost to plan, design, build, or upgrade. Other factors contributing to this high initial cost include the inability to make accurate price forecasts due to supply inconsistencies, the high volatility of oil prices, as well as the high cost of transmission of the energy produced due to insufficient transmission infrastructure and dilapidated distribution infrastructure.
- **Legal and regulatory barriers:** It mostly presents itself in the form of policy uncertainty and includes: a) inconsistent standards and compliance requirements; b) lack of cost reflectivity in electricity tariff; c) policy uncertainty regarding renewable energy buyback scheme and future feed-in tariff; d) policy uncertainty on technical and commercial requirements for a feed-in tariff³³. Other barriers include a lack of clear national energy efficiency standards, no clear air emissions regulation, and a lack of clear national climate policy.
- **Market performance barriers:** Market performance barriers in Nigeria include lack of access to credit and proper financing options, perceived technology performance, and lack of technical and commercial skills and information. Besides, government subsidies for fossil fuels lead to market price distortions, market failure to value the benefits of energy from non-fossil fuels, and market failure to effectively internalize all conventional energy costs, including the risks of supply disruption, pollution, etc.

³¹ Babatope & Audu, 2020.

³² Ibid.

³³ Edomah, 2016.

2.3 Demand-Supply Disruption and Stalled Efforts in the Power Sector Reforms

The COVID-19 pandemic caused major demand-side disruptions in the electricity sector. The lockdown implemented by the government resulted in the complete closure or reduction of the operations of many businesses, thereby significantly reducing their net electricity consumption. Meanwhile, the electricity that should have been consumed by these companies was diverted to residential customers, as their consumption increased during the lockdown. Nevertheless, the rate to be paid by residential customers is lower than the rate to be paid by these companies. Furthermore, the difficult economic conditions faced by consumers, now mostly residential, may hinder their ability and willingness to pay electricity bills. Therefore, electricity distribution companies may receive less revenue for the same amount of electricity distributed during the lockdown, which might worsen their already precarious financial situation³⁴.

On the supply side, given that Nigeria's renewable energy industry relies heavily on imports of equipment and components, especially from China, its supply chain has been significantly disrupted due to the closure of borders and lockdown measures implemented by countries around the world. Therefore, imports of equipment and components for the renewable energy industry may be hampered in the short term. Furthermore, the nature of services provided by some of the renewable energy companies requires skilled workers to be sourced from other countries to undertake technical functions and carry out installation activities in Nigeria. Yet, this proves difficult due to travel restrictions, which may further stall the operations of these companies. Moreover, construction activities of critical renewable power projects by the government may be delayed due to stalled investment decisions, which could further elongate the timeline for the generation of power from the completed power plants.

Besides demand and supply disruption, the COVID-19 pandemic has delayed several reforms planned by the government³⁵. The Nigerian Electricity Regulatory Commission has suspended the upward revision of electricity tariffs for 2020, which was scheduled in the Multi-Year Tariff Order (MYTO). The electricity tariff adjustment proposal was to be implemented in April 2020, but the National Assembly postponed it until the first quarter of 2021. This postponement raises several difficulties. Given that the electricity sector generates losses estimated at 122 billion nairas per month³⁶, it is uncertain whether the government will be able to cover this amount consistently, given its revenue shortfall due to the drop in oil prices observed in the first half of 2020. Also, in the absence of adequate planning for the long-term sustainability of the sector, it will be difficult to secure additional financing.

3 Building A Better and Resilient Energy Future for Nigeria?

Looking ahead, it is true that the COVID-19 pandemic has momentarily diverted essential resources as well as political and financial attention from energy transition, but at the same time, it represents an opportunity to rethink current development models in order to build a more resilient, sustainable, and inclusive future. A window of opportunity is therefore opening up for Nigeria to re-initiate and accelerate progress on sustainable and secure energy supply and access. It is also an opportunity for Nigeria to play a more prominent role in the Atlantic Basin, given its weight in the African economy and the diversity of its natural resources, in order to strengthen its

³⁴ Enechi et al, 2020.

³⁵ KMPG, 2020a.

³⁶ Ibid.

ties with countries in the region. To this end, it is therefore essential to identify the main factors that will enable Nigeria's sustainable economic recovery to continue and address the persistent structural challenges that impeded the transformation of the energy sector for years.

3.1. Government's Response to COVID-Crisis: A Glance at Energy Reforms

To face the dire consequences of the COVID-19 pandemic on the Nigerian economy, the Federal Executive Council approved the Nigerian Economic Sustainability Plan (NESP), developed by the Economic Sustainability Committee, in June 2020. The stimulus package was settled at 2.3 trillion nairas³⁷ funded by special accounts, the Central Bank of Nigeria (CBN), external bilateral/multilateral sources, and other funding sources. The NESP is based on three pillars. The first one relates to real sector measures and includes a variety of projects and policy approaches focused on job creation “*across the fields of agriculture and agro-processing, food security, housing construction, renewable energy, infrastructure, manufacturing, and the digital economy*”³⁸. The second pillar focuses on fiscal and monetary measures and aims to maximize government revenues and optimize expenditure, while the third pillar deals with implementation, through a ministerial implementation committee.

The NESP includes some provisions regarding energy. For the pillar relating to real sector measures, the NESP includes a Solar Power Strategy (Table 2) which aims to install 5 million Solar Home systems and mini-grids, thus impacting up to 25 million beneficiaries and supporting 250,000 jobs. The project is expected to help increase the stock of affordable energy by providing solar energy to rural communities lacking access to the national grid. The provision of reliable electricity to health clinics is considered a priority. Access to low-cost financing from development finance institutions and the CBN would be provided to private sector installers of solar systems in order to install solar systems at an affordable price and a monthly ‘pay-as-you-go’ payment would be proposed for consumers. The project is expected to promote the local production of solar components and appliances as well.

Table 2: Energy-related Measures Approved Under the NESP

Strategy	Solar Power Strategy	National Gas Expansion Programme
Implementing Structure	Federal Ministry of Power; Rural Electrification Agency; Niger Delta Power Holding	Track 1 Federal Ministry of Petroleum Resources, NNPC Track 2 Inter-Ministerial Committee on LPG
Estimated Cost	240 billion nairas (\$585.6 million)	Track 1 90 billion nairas (\$219.6 million) Track 2 23.4 billion nairas (\$57.1 million)
Timeline	12 months	Track 1 12 months Track 2 12 months

Source: Economic Sustainability Committee of Nigeria, 2020.

³⁷ Roughly \$5.6 billion.

³⁸ Economic Sustainable Committee, 2020.

The NESP also introduces a National Gas Expansion Programme (Table 2) which is divided into two tracks. Track 1 will focus on accelerating the transition of Nigeria to a post-oil era, promoting the domestic use of cleaner fuels and preparing for export opportunities. It also focuses on developing modular compressed natural gas refilling plants on the downstream side, for the distribution of gas. Track 2, on the other hand, will oversee and lead any disparate efforts undertaken by industry players to promote liquefied petroleum gas (LPG) consumption in Nigeria. It aims at greater involvement of the private sector, both to organize the sector to support the shift from the use of traditional fuels such as kerosene, wood, etc. to the use of cleaner LPG fuels and to promote the distribution and domestic manufacturing of cylinders and other accessories to encourage the adoption and use of LPG.

Within the fiscal and monetary measures pillar, the NESP has proposed a very ambitious reform to safeguard oil revenues, by deregulating the price of refined petroleum products, establishing a sustainable framework for maintaining the national strategic stock, and reducing the average production cost of crude oil by at least 20%. As of September 2020, the Petroleum Products Pricing Regulatory Agency (PPPRA) announced that following the government's decision to fully deregulate the downstream oil sector, the pricing of petroleum products should now follow the rules of the international oil market pricing mechanism as well as supply and demand forces to set the retail price of gasoline. However, recent developments show that the NNPC is keeping the pump price of gasoline unchanged in March 2021 despite increasing crude costs, which casts doubt on Nigeria's commitment to remove fossil fuel subsidies.

3.2. Creating Structures for the Transition

The energy transition is inevitable but complex as there is no universal strategy applicable to all countries. The transition is all the more challenging for countries like Nigeria that rely heavily on oil exports to drive their economies and meet the needs of their populations. Yet this source of 'blessing' is also a curse because it leaves their economies vulnerable to the volatility of oil prices on international markets. Breaking out of this dilemma and building a sustainable and resilient future, therefore, involves the need for greater flexibility of available energy technologies, an increased diversification of the energy mix, an improvement in energy efficiency, and the provision of energy services that are consistent with economic and social inclusion.

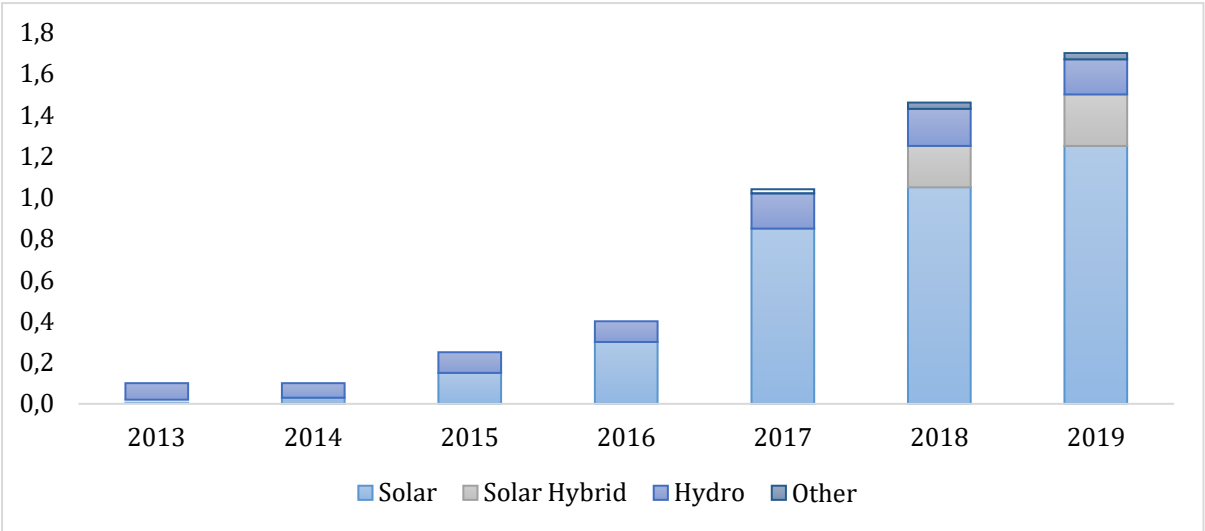
It is clear that Nigeria will not abandon oil in the short to medium term given the large deposits available and its importance as a revenue source for the federal government. The energy transition for Nigeria is far more likely to result in a more diversified energy mix and a stronger regulatory and policy framework that supports the development of new energy technologies and energy efficiency and safeguards the economy from the volatility of global oil prices. Thus, accelerating efforts to transform Nigeria's energy sector and set the country on the path towards energy transition becomes justifiable, not only from an environmental perspective but also from an economic one, despite a challenging national and international economic environment.

In this sense, given its abundant natural gas reserves, the latter can be used as a transitional fuel to buy time for putting the appropriate transition structures in place. Including a natural gas expansion program in the NESP is a good step forward, but the challenge is to implement it rapidly and effectively. Some progress has already been made in reducing gas flaring in Nigeria, but much remains to be done to reach the global 2030 deadline, especially after failing to meet the 2020 national target. In the electricity sector, natural gas can also contribute to grid stability by offsetting the intermittent nature of renewables, as fluctuating levels of renewables can affect the

quality and reliability of the electricity supplied, and the most proven and reliable storage technologies are still too expensive for Nigeria³⁹.

In terms of energy access, Nigeria should pursue large-scale investments in centralized and decentralized grid infrastructure, while exploiting the significant potential of renewable technologies in these areas. The fast development of mini-grids and off-grids can supplement centralized grid development efforts to help enable electricity access to a considerably larger market. But for this to become the mainstream, a paradigm shift is required. The mini-grid sector in Nigeria started to develop only recently as most operators are established since 2012⁴⁰. As of 2019, 59 mini-grids operate in Nigeria with a cumulated capacity of 2.8 MW, of which 52 mini-grids used solar power (Figure 13)⁴¹. Efforts in developing a legal and institutional framework for mini-grids have also fairly recently started with the adoption in 2017 of the Regulations for Mini-Grids by the Nigerian Electricity Regulatory Commission (NERC) and the launch of the first call for expression of interest for off-grid projects by the Rural Electrification Fund (REF) during the same year.

Figure 13: Nigeria’s installed mini-grids, by capacity (MW)



Source: SE4ALL, 2020.

Facilitating the transition will also require significant investment and financing. The reform of petroleum subsidies in Nigeria, if effectively implemented, can generate significant savings that can be used to support the renewable energy sector to counter the price disparity with fossil fuels and encourage research and development. The Nigerian Ecological Fund can be another source of public funding, provided it is reformed and expanded beyond its current focus on addressing ‘severe environmental problems’ to cover climate change as well, with an emphasis on mitigation and resilience. Beyond the public investment in green infrastructure, the government should also engage the private sector to foster a green economy.

Investments should also promote upstream value chain development so that Nigeria builds local plants for the manufacturing or assembly of renewable energy equipment and associated devices. This raises the fundamental issue of investing in human capital to ensure a skilled local workforce

³⁹ Adewuyi, 2020.

⁴⁰ Energy Sector Management Assistance Program, 2017.

⁴¹ Sustainable Energy for All, 2020.

that will be able to meet the needs of the new technologies that are emerging. The effective provision of data can also support rapid investments in renewables, electrification, and clean cooking, as it offers information on optimal renewable sites, communities that are optimally positioned for commercial investments in electrification and adoption and can thus encourage the involvement of private actors as well.

Beyond technology and financing, alignment between Nigeria's international obligations and domestic policies and legislations are of utmost importance. If Nigeria is serious about achieving a sustainable and resilient future, then it becomes crucial to determine the right policy mix and funding in order to position itself as a renewable energy leader in Africa and the Atlantic Basin. Several policies have been developed over the years to enhance the government's pursuit of renewable energy sources, as an additional instrument to solve the electricity challenge Nigeria faces. These policies include the Electric Power Sector Reform (2005), the Renewable Energy Master Plan (2006/2012), and The National Renewable Energy Action Plan (2015 -2030). Yet, rigorous monitoring must be carried out in order to assess the progress of the implementation of these policies and their impact.

Furthermore, one of the outcomes of the COVID-19 pandemic is that it has shattered the boundaries of what is politically possible in terms of policies and strategies. Nigeria's announcement to halt oil subsidies is a step in the right direction. However, its implementation remains to be seen. Unfortunately, there are signs that this reform is facing several difficulties. The NNPC stated that gasoline prices are to remain unchanged in March 2021 despite oil prices increasing again, in "*order not to jeopardize ongoing engagements with organized labor and other stakeholders on an acceptable framework that will not expose the ordinary Nigerian to any hardship*"⁴². Indeed, with food inflation at a 12-year high, Nigeria now risks a backlash if it allows fuel costs to go up in line with the rebound in crude on international markets. This does not bode well for the success of the deregulation of petroleum products prices.

To sum up, international experience has shown that the success of energy transition is best attributed to supportive policy structures, favorable legislative decisions, and a competitive environment. Therefore, strong policies and institutions will be essential for the transformation of the energy sector in Nigeria. In order to effectively build a sustainable future, the government must establish and empower institutions such as ministries, regulators, and rural electrification agencies to ensure that the right frameworks are in place to successfully restart the economy while promoting renewable energy development, increased electrification, and access to clean cooking. Coordination between different ministries, institutions, and agencies, and accountability of their actions, will thus be essential to ensure a coherent strategy and a common goal.

3.3. *Towards a Revival of Transatlantic Energy Cooperation*

In recent years, transatlantic cooperation on climate and energy issues has generally been weak, with a few notable exceptions⁴³. These relations have focused mainly on the dynamics between the United States (US) and the European Union (EU). However, addressing the pressing and intertwined crises that threaten global development requires that developing countries become an active and integral part of these policy coordination processes, both at the transatlantic and global levels. As one of the major energy producers in the South Atlantic basin, Nigeria could

⁴² Osae-Brown. 2021.

⁴³ Brattberg, 2020.

position itself as an energy leader in the region. However, issues such as corruption and decaying infrastructure have prevented the country from playing a leading role in Africa so far.

If Nigeria seeks to assume a more prominent role in the region, it must address the key energy challenges it faces, revive its economy, and improve governance structures. Strengthening bilateral and multilateral cooperation on issues of common interest is also crucial. Cooperation between Nigeria and the US, for instance, is not new. In 1999, both countries signed a Memorandum of Understanding (MoU) on Energy Policy, which recognized that “*energy security, economic growth, and quality of life can be enhanced through the efficient and environmentally friendly use of energy sources and sustainable development*”. It further stipulated that “*cooperation in support of such energy use and sustainable development would promote increased economic interaction and expand opportunities for international trade and investment between the US, Nigeria and with other West African nations*”⁴⁴.

More recently, in 2014, Nigeria and the US signed another MoU regarding the Power Africa Initiative, which aims to increase significantly the amount of electricity available in Sub-Saharan Africa. In this MoU, Nigeria commits to make key policy reforms and structural changes for the energy sector, including the implementation of tariff reform, notably the Multi-Year Tariff Order, the continued liberalization of the power sector, the review of the renewable energy feed-in-tariff, the reduction of gas flaring and the establishment of plans and financing strategy for power transmission. On the other hand, the US pledges to offer financial support in project preparation, feasibility, and technical assistance grants to develop renewable energy projects and to provide assistance to help resolve technical impediments to the deployment of power projects.

Nigeria and the EU have also entered into a series of partnerships covering a wide range of areas to support Nigeria in its fight against poverty, and in its efforts to strengthen national initiatives to manage their own resources more effectively and efficiently⁴⁵. The EU’s sustainable energy work in Nigeria is in line with their global frame of action for energy, which is set by the UN 2030 Agenda for Sustainable Development (2015) and, more specifically, the 7th Sustainable Development Goal (SDG7). Their sustainable energy and access to electricity program, for instance, which amounts to €150 million for the 2014-2020 funding period, focused on improving access to the sustainable supply of electricity, particularly for the poorest and in the least developed States, especially in the North.

South-South cooperation will also be necessary to support regional integration on energy issues. For instance, a gas pipeline project between Nigeria and Morocco has been in discussion since 2016. The pipeline would connect Nigerian gas to every coastal country in West Africa, reaching Tangiers, Morocco, and Cádiz, Spain. It would be an extension of the existing West African Gas Pipeline, which already connects Nigeria with Benin, Togo, and Ghana. A feasibility study for the construction of the pipeline was achieved in January 2019, and, in August 2019, the pipeline proposal was presented at a special meeting of the Economic Community of West African States. Even though the pipeline faces a myriad of challenges linked to financing, security, and land and environmental permits, the front-end engineering and design had entered the second phase by March 2020.

Therefore, improved integration of Nigeria into the Atlantic space will be of great benefit to the transatlantic community but will require overcoming serious challenges, both internal and

⁴⁴ US Department of Energy, 2009.

⁴⁵ European Commission, 2021.

external to Nigeria. In recent years, issues related to energy fuels and services have risen to the forefront of national and international policy agendas. Yet cross-border coordination on energy issues between government and other actors has proven difficult. This challenge stems from the fact that the energy field is beset with public goods and externalities issues, many of which are transboundary and thus beyond the scope of individual national governments. Addressing these difficulties will require extensive governance innovation that preserves intellectual property rights and promotes affordable innovation and dissemination of new energy technology, as well as the implementation of the appropriate institutions, which develop, implement, and enforce these rules.

Conclusion

The global energy landscape is undergoing significant changes in terms of demand, supply, technology, markets, and investments. Today, new developments beyond the traditional considerations of oil and gas supply security and price stability are reshaping the nature and direction of international energy cooperation and governance. These developments have also created new challenges while underscoring the importance of reliable and diversified supply chains for equipment, raw materials, and energy resources. Countries, therefore, need to adapt to these new changes in order to ensure the sustainability of their energy systems and thus guarantee sustained economic development.

Nigeria is among the largest suppliers of oil and natural gas in the Atlantic Basin. As such, it is well integrated into the global energy system. However, its energy sector faces a myriad of challenges, ranging from the economy's overdependence on oil, frequent disruptions in oil and gas supply, outdated energy infrastructure, and underutilization of renewable energy resources. These challenges, in addition to corruption and security issues, have hampered Nigeria's economic development, which remains vulnerable to fluctuations in international energy prices, and were exacerbated by the consequences of the COVID-19 pandemic.

While the priority for governments around the world, today in the post-COVID-19 era, is to revive their economies, for a country as heavily dependent on oil exports as Nigeria, achieving this goal requires a profound transformation of its energy sector in order to limit the exposure of its economy to oil price volatility and thus avoid relapsing into another recession in the event of a future oil shock. The establishment of a sustainable, economic, and environmentally friendly energy framework is therefore seen as central for the secure and time-efficient drive of an all-inclusive economy in Nigeria and other countries in sub-Saharan Africa.

Therefore, the path to a sustainable and resilient future for Nigeria must be paved with deliberate and coherent policies, as well as an oversight body to ensure that these directions are implemented effectively. Building this future thus implies the need for greater flexibility in available energy technologies, increased use of renewable energies, improved energy efficiency, as well as secure energy access while ensuring economic and social inclusion. These measures will need to be accompanied by an overhaul of Nigeria's economic development model to move away from the current oil rent-based economy model that failed to modernize the country.

Another key aspect of establishing the necessary structures for the transformation of Nigeria's energy sector is the adoption of a coherent policy and regulatory framework that supports the transition and encourages increased investment while enhancing the positive externalities on the other sectors of the economy, in terms of job creation and value addition. Currently, the post-

COVID-19 economic sustainability plan, while containing token green gestures, does not espouse green growth as a core objective, as renewable energy and energy transition strategies account for only 15% of the NESP budget. Political will must therefore drive these reforms.

In addition to these internal reforms, continued cooperation between Nigeria and the Atlantic Basin countries in the energy sector will be of great benefit to the transatlantic community. Building on past achievements and addressing current challenges must continue with greater urgency to forge resilient and self-sufficient energy systems in order to diversify supply chains and decarbonize the energy system. Countries of the Atlantic Basin now have a window of opportunity to formulate coherent investment strategies, develop new energy technologies, and synchronize their engagement with global geopolitical challenges, particularly from Russia and China, without losing sight of the opportunities that developing countries of the Atlantic Basin like Nigeria offer in terms of energy resources.

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