IMPACT OF RENEWABLE ENERGY ON THE GAS INDUSTRY IN NIGERIA: AN APPRAISAL*

Abstract

Nigeria's energy transition presents a complex regulatory and economic challenge arising from the increasing deployment of renewable energy alongside the nation's continued dependence on gas. This article examines the impacts of renewable energy development on Nigeria's natural-gas industry, with particular emphasis on declining gas demand, revenue, investment, and funding. It appraises the legal and institutional framework governing the energy transition, including the Petroleum Industry Act, Climate Change Act, Electricity Act, National Renewable Energy and Energy Efficiency Policy, Renewable Energy Master Plan, and relevant regulatory institutions and instruments. The article argues that the increasing adoption of renewable energy, battery storage, and other renewable technologies is gradually altering consumer behaviour, electricity-generation choices, investment patterns, and the economic attractiveness of natural gas. The consequent reduction in gas utilisation may affect domestic consumption, exports, government revenue, and future investment in gas infrastructure. However, the article contends that the transition should not be conceived as an immediate replacement of natural gas with renewable energy, given Nigeria's substantial gas resources, persistent electricity deficit, and industrial dependence on gas. Instead, Nigeria needs a legally regulated, economically viable transition that promotes renewable energy while retaining natural gas as a strategic transitional and balancing fuel. The article recommends a comprehensive Renewable Energy and Energy Efficiency Act, stronger institutional coordination, predictable investment incentives, effective environmental enforcement, and protection of affected workers and host communities. It concludes that a coordinated gas-and-renewables framework offers a more sustainable pathway for balancing energy security, economic development, environmental protection, and energy justice.

Keywords: Renewable Energy, Environmental Degradation, Oil And Gas, Energy Security and Diversification, Impact of Renewable Energy, Legal and Institutional Framework

1. Introduction

Energy is the wheel on which man's economic activities revolve. Energy is generally seen as the force and ability to do work. It is primarily gotten from oil and gas, coal, and renewable energy (hydro, wind, and solar). Gas and renewable energy are central to global energy consumption. They contribute 39% and 7% of the Nigerian energy mix, respectively, while the other 53% is obtained from oil[1]. Nigeria is richly blessed with abundant energy yet afflicted by an energy crisis. In Nigeria, gas is used for domestic, industrial, transportation, and generation of electricity. Natural gas is seen as a naturally occurring hydrocarbon gas mixture, mainly methane, but including various quantities of higher alkanes, and occasionally small percentages of carbon dioxide, nitrogen, hydrogen sulphide, or helium. Methane makes up 70-90% of natural gas. It is derived from dead animals buried beneath the earth[2]. Nigeria is ranked the 9th nation with the highest gas reserves in the world and the first in Africa[3]. Its gas reserves and production are estimated at 210.54 trillion cubic feet (tcf)[4] and 2,792 billion cubic feet (bcf),[5] respectively. This huge gas reserve appears to signal hope for solving Nigeria's revenue and energy crises and greenhouse gas emissions, which have bedevilled her economy. However, as she tries to

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[1]PK Oniemola, 'Why Should Oil-Rich Nigeria Make a Law for the Promotion of Renewable Energy in the Power Sector?' *Journal of African Law, 60, 1 (2016*) 29-55 (School of Oriental and African Studies 2024)

[2]MET Group, 'What is Natural Gas? Meaning, Definition and Description' < https://www.bing.com/search?q=MET+Group"+What+is+Natural+Gas%3F+Meaning%2C+Definition+and+Description&cvid=b57b1> accessed 30th July 2024.

[3]UJ Obaro, and M Iwegbu, 'Panacea to Domestic Gas Supply Accessibility and Affordability in Nigeria' (Paper presented at the SPE Nigeria Annual International Conference and Exhibition, Lagos, Nigeria, July 2023) doi:< https://doi.org/10.2118/217157-MS > Accessed 30th July 2024; S Anyanwu, 'Nigeria Has the 9th Largest Gas Reserve in the World and First in Africa' <https://www.bing.com/search?q=Nigeria+has+the+9th+largest+gas+reserve+in+the+world+and+first+in+Africa&cvid=9f8b20d3bd72488eb162f0b593e2b8ca&gs_lcrp=EgZjaHJvbWUyBggAEEUYOdIBCDgyNzFqMGo0qAIIsAIB&FORM=ANAB01&PC=U531 > accessed 31st July 2024; Largest Gas Reserve in the World and First in Africa < https://www.bing.com/search?q=Nigeria%20has%20the%209th%20largest%20has%20the%209th%20largest%20gas%20reserve%20in%20in%20the%20world%20and%20first%20in%20Africa%202024&qs=n&form=QBRE&sp=-1&lq=1&pq=nigeria%20has%20the%209th%20largest%20gas%20reserve%20in%20the%20world%20and%20first%20in%20africa%202024&sc=077&sk=&cvid=2EFE5C07D3094A73BBAC31D95213B6B6&ghsh=0&ghacc=0&ghpl= > accessed 31st July 2024

[4] G Komolafe, 'Nigeria's Oil and Gas Reserves 2025 Reach 37 billion Barrels & 210.5 TCF' Premium Times (April 13th 2025) < https://www.premiumtimesng.com/oilgas-reports/787371-nigerias-oil-reserves-stand-at-37-28bn-barrels-gas-hit-210-54-tcf-nuprc787371.html > accessed 19th May 2026

[5]D Tennant and P Ahmadian, 'Gas Regulation' Lexology GTDT, Law Business Research (2022)

harness her gas industry to find solutions. Gas exploration activities have caused more environmental and energy crises and a reduction in revenue in Nigeria.

It is against the above background that the need to diversify her economy became imminent, and what readily comes to mind is renewable energy. It refers to the infinite energy, always available in unlimited amounts in nature, that is replenished in a comparatively short time and capable of continuous harvest through proper sustainable planning. Examples include wind power, geothermal power, solar, hydro power, and biomass[6]. It is gotten from sources that are essentially inexhaustible, unlimited, and naturally replenishing in nature, such as wind, refuse, waves, water, sun, bio-fuel, etc[7]. They are clean, environmentally friendly, and come from several natural sources[8]. Renewable is also called green power resources that offer the maximum environmental gains. It is an energy source that is naturally replenishing and replacing itself[9]. Renewable energy is one way of attaining the objective of decentralized energy options. However, this has not been achieved in Nigeria[10]. The National Energy Policy has been advocating for renewable energy sources, which has yet to be seen as a 'national priority'[11].

Renewable energy is seen as a substitute for orthodox energy sources because of its sustainable and reliable advantages[12]. The apparent aim is to stop future reliance on imported orthodox energy sources. These renewable energy sources (solar, wind, hydro, Biomass, etc) are viewed as main components of sustainable developments because: They negatively impact less compared to non-renewable sources, their usage can address or improve current and future environmental condition[13] on greenhouse gases (GHG) emissions such as carbon dioxide, oxides of nitrogen and sulphur and mainly matters coming from the use of power gotten from oil, natural gas, and coal[14] with improvement of energy safety and provision of employment[15]. Renewable sources can produce electricity with low or zero carbon emissions;[16] renewable sources will, in no distant time, dominate the Nigerian energy supply, as Nigeria may no longer depend on fossil fuels.

2. Types of Renewable Energy

Solar

Man and sunlight are twin and inseparable. Man depends on sunlight for most of his activities and survival on Earth. Over 4.5 billion years, the Sun has been shining, and its 1400 times more energy available than all the energy needed on Earth[17]. Solar energy is a new area that has given rise to scientific research in recent times. Solar energy is the direct use of sunlight energy as it reaches the Earth[18]. It is the energy that is directly obtained from sunlight. There were two major arguments in 2014 on the amount of energy got from solar. One argument is that the energy generated from the sun is approximately 3.810^{23} KW, about 1.082 million tons of oil equivalent (Mtoe) per day, translating to more 4000 times

[6] M Oluwagbemigun, Regulatory Framework on Sustainable Development and Renewable Energy in Nigeria in L Atsegbua (ed) *Beyond Fossil Fuel: Renewable Energy Law and Policy*, Fifers Lane Publishers, 126 Ekenwan Road, Benin City, Edo State, 58

[7] Y Oke, *Energy and Petroleum Industry Law* (2 edn) (Ikeja, Lagos: Princeton & Associates Publishing Co. ltd 2023)716

[8] L Atsegbua, *Environmental Law in Nigeria: Theory and Practice* (Benin City Ambik Press 2010) 295

[9] BA Garner, *Black's Law Dictionary* (10th Ed USA: West Publishing Co 2014)

[10] Oke (n 7) 715

[11] Ibid, 716

[12] Q Wang, C Zhang & R Li, Does Renewable Energy Consumption Improve Carbon Efficiency? Evidence from 116 Countries, *Energy & Environment* (2023) 36 (2) 1-22 3 < https://econpapers.repec.org/article/saeengenv/v_3a36_3ay_3a2025_3ai_3a2_3ap_3a807-828.htm > Accessed 17th July 2025 <Q Wang, C Zhang & R Li, Does Renewable Energy Consumption Improve Carbon Efficiency? Evidence from 116 Countries, E*nergy & Environment* (2023) 36 (2) 1-22 3 - Search> Accessed 21 May 2026

[13] B Gradziuk & P Gradziuk, 'The Impact of Renewable Energy Production on Employment' (2018) 15(3) 139-146 <https://www.researchgate.net/publication/358573621_The_impact_of_renewable_energy_production_on_employment > 139 Accessed 17th July 2025

[14] ZA Eluma, & AS Momodu, Climate Change Mitigation and Renewable Energy for Sustainable Development in Nigeria: A Discourse Approach' *Renewable and Sustainable Energy Reviews (2017) 76, 72-80*

[15] Gradziuk (n13) 139; A Dunlap,' Does Renewable Energy Exist? Fossil Fuel +Technologies and the Search for Renewable Energy (2021) 83 in A critical Approach to the Social Acceptance of Renewable Energy Infrastructures (83-102) DOI:10.1007/978-3-030-736996_5 Assessed 17th July 2025 < https://www.researchgate.net/publication/354125885_Does_Renewable_Energy_Exist_Fossil_Fuel_Technologies_and_the_Search_for_Renewable_Energy > Accessed 17th July 2025

[16] Wang (n 12) 1-22 4

[17] OA Somoye, 'Energy Crisis and Renewable Energy Potentials in Nigeria: A Review', *Renewable and Sustainable Energy Reviews* (2023) 188, 113794 2

[18] Atsegbua (n 8) 295.

compared to the crude oil production in Nigeria and about 13, 000 times the daily natural gas production[19]. While the other, general energy is about 19.8MJ/m^2/day[20] and 4000 times and 13000 times preferred to crude and gas[21]. Solar energy has several merits over fossil fuels, which fossil includes safer and cheaper to maintain; consequently, it will be cheaper if production increases and doubles[22]. Solar helps in connecting rural communities to electricity when they are not linked or connected to the national grid,[23] or whose connections to the national grid are expensive because of their inaccessible nature and location[24]. It does not easily pollute the environment and improves public health[25]. Nigeria is advised to use solar because its weather (heavy sunshine and longer days) is widespread[26]. Solar is a major source of electricity in rural areas in Nigeria and is used for street lights in major streets of the country. It is also used to pump water in rural areas and by farmers to dry their crops, etc.[27]. Solar energy seems to be the most used renewable source in Nigeria and the world[28]. Solar will definitely reduce the massive reliance on gas and other conventional energy in Nigeria, hence flagging the beaming light of hope for the nation.

Hydro

Water is essential to human existence. It is a commodity that cannot be dispensed with. It is used daily for economic, personal, and industrial purposes. Hydro energy was first used by farmers for irrigation. This is part of the oldest source of energy in the world. It is believed to have been invented and used in 6000 BC somewhere around Mesopotamia (now Iraq). It accounted for about 40% of energy generation in the U.S till 20th century (1920) as its foremost source of energy[29]. The installed hydro energy capacity in the world in 2011 moved from 900, 822 MW to 1, 177, 285 MW in 2021[30]. Globally, Nigeria is recognised as the 9th country with the most hydropower capacity[31]. The flowing waters and the movement in the ocean are sources of energy[32]. Water is abundant in Nigeria, mostly from the River Benue and the River Niger, and from the Niger Delta region. These hydro energy water sources include lakes, oceans, rivers, and lakes. Basically, hydro can produce electricity through hydroelectric schemes, tidal power, and wave power; unfortunately, Nigeria is managing to exploit only hydroelectricity[33]. Hydro energy is the energy that is derived from water. It is the generation of energy through the movement of water. Nigeria has about 8,824MW hydroelectric power, of which only 24% and 4% have been exploited on a large scale, respectively[34]. It is argued that hydro energy has contributed meaningfully to the generation of electricity in Nigeria.

Wind Energy

The fastest-growing renewable energy is wind energy[35]. Wind energy uses wind to generate energy. It is the usual movement of air masses generated as a result of diverse heating of the Earth, and it is used for pumping of water and

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[19]M Shaaban & JO Petinrin, Renewable Energy Potentials in Nigeria: Meeting Rural Energy Needs, *Renewable and Sustainable Energy Reviews* (2014)29, 76

[20]EN Vincent & SD Yusuf, Integrating Renewable Energy and Smart Grid Technology into the Nigerian Electricity Grid System, *Smart Grid and Renewable Energy* (2014) 5, 25

[21]Somoye, (n 17)113794 2

[22] Ibid, 2

[23] Ibid, 2

[24] NV Emodi & K Boo, Sustainable Energy Development in Nigeria: Overcoming Energy Poverty, *International Journal of Energy Economics and Policy* (2015)5 (2) 580-597, 588

[25]AS Racheal, Impact of Renewable Energy on Green Computing in Nigeria, *International Journal of Leading Research Publication* (2020)1(2) 2582-8010

[26]L Atsegbua, Utilization of Natural Resources in Nigeria: Issues and Challenges in Lawrence Atsegbua (edn) *Beyond Fossil Fuel: Renewable Energy Law and Policy*, Fifers Lane Publishers, 126 Ekenwan Road, Benin City, Edo State 21; Oluwagbemigun (n6) 58

[27]S Idehen, Impact of Renewable Energy on Climate Change: An Overview in Lawrence Atsegbua (edn) *Beyond Fossil Fuel: Renewable Energy Law and Policy,* Fifers Lane Publishers, 126 Ekenwan Road, Benin City Edo State, 38

[28]E Okumagba, Renewable Energy and Energy Efficiency, in L Atsegbua (edn) *Beyond Fossil Fuel: Renewable Energy Law and Policy,* Fifers Lane Publishers, 126 Ekenwan Road, Benin City, Edo State, 108

[29]Ibid 112

[30]Somoye (n21) 23

[31] Ibid., 23

[32]D Gupta et al, Impact of Renewable Source on Energy System, *Iconic Research and Engineering Journals*, (2018) 1 (9) 285

[33]Atsegbua (n 26) 20

[34]EA Williams, Renewable Energy Sources for the Present and Future: An Alternative Power Supply for Nigeria, *Energy and Earth Science (2019)* 2 (2) 2578-1359, 33

[35]GHVI Vithanage, K.D Vithanage, Implementing Renewable Energy by Considering the Greenhouse Gas Emissions, *Journal of Research Technology and Engineering J Res* (2021)2 (3) 09-17; Muhamed Shaaban and J O Petinrin,' Renewable Energy for Continuous Energy Sustainability in Malaysia: Potentials', *Renewable and Sustainable Energy Reviews* (2014)29, 977; Emodi (n 24) 588 590.

milling of grains, mostly in rural areas[36]. Wind is the usual movement of air on Earth. Wind is the practice of using wind to generate energy; it is traceable to 5000 BCE on the River Nile, when it was used to propel boats[37]. The generation of energy by wind is premised on the movement of air in motion. It is the use of wind turbines to gather energy from wind[38]. An example of wind energy is a wind turbine technology that captures kinetic energy with its rotating blades at centra linked to a shaft generator that produces energy[39]. The direction of the wind results from the sun's location and the country's seasons. Examples of climates with higher wind energy include Germany, China, the USA, Spain, the UK, etc. Wind energy can be used both in domestic and rural areas and for irrigation[40]. It is sustainable, environmentally friendly, and readily available, and does not pollute the air; it is abundant and inexhaustible[41]. Nigeria has enough capacity for wind harvesting to generate energy[42] and has the capacity to create jobs. North African countries- Morocco, Tunisia, and Egypt are leading in wind energy, as Nigeria has not fully tapped into and appreciated it. However, Nigeria has managed to put in place a few wind turbines, like Saaya-Gidan-Gada, having a capacity of 5.0 KWP[43]. The potential of wind energy is dependent on wind speed.

Biomass

Biomass is the energy produced with the use of feedstock. It is the energy got from the process of burning animal waste, wood, wheat,[44] forage grasses, shrubs, etc[45]. Biomass energy is energy that is primarily obtained from organisms.[46]. It is biological material.[47] obtained by the process of photosynthesis using light and is a major energy source in Nigeria[48]. It is environmentally friendly and can produce more energy than fossil fuels. Globally, it is the largest energy source[49]. Biomass(firewood) is used for heating and cooking, and over 70% of Nigerian citizens in rural communities use it as their main source of energy.[50]. It is believed that Biomass emits a high level of greenhouse gas not good for the environment. As a result of the smoke from the burning of trees, it also stands as a major alternative to gas (fossil fuel).

3. Legal and Policy Frameworks

Petroleum Industry Act (PIA)2021

The PIA was enacted for the general governance of the industry. The PIA is the chief law of the industry, enacted to provide more comprehensive regulatory provisions for the industry's efficient regulation. It came when the oil and gas sector was in a shattered state, facing several challenges such as too many corrupt activities, in-house fighting and conflict between stakeholders, lack of institutional coherence, agitation by host communities, etc. Thus, the enactment of the PIA was greeted with great jubilation as Nigerians and operators of the industry welcomed the Act with joy. This is so because the Act was seen as a law to be used to solve and resolve the challenges bedeviling the industry. The Act restructures the regulation and governance of the gas and oil industry. The Act fuses all other sixteen (16) existing oil and gas laws into one framework to address and reduce corruption and weakness, and create a business-friendly environment. In fact, the Act is seen as one big omnibus legislation governing all aspects of the industry, comprising governance, administrative, and fiscal frameworks. The Act is intended to push Nigeria's gas sector forward into the transition era. The Act is supreme over any other law save the Nigeria constitution, such that any law that's contrary to it is, to the extent of that conflict, void.[51]. It vests the right to own and control the industry in the government of the federation.[52] This is contrary to international best practices. The Act should have extended ownership to the persons having customary and traditional

[36]Idehen, (n 27)38Atsegbua (n26); Emodi (24) 590
[37]Okumagba (n28)108
[38]Oluwagbemigun, (n 6) 59
[39] Vithanage (n 35) 590; Gupta (32) 285
[40]RN Clark, Wind Energy for Pumping Agricultural Water (Paper Presented on at the First U.S.–China Conference on Energy, Resources and Environment in Beijing, China on 7 November 1982) 520-527
[41]Williams (n 34) 2578-1359 30
[42]Atsegbua (n 26) 20
[43]Oluwagbemigun, (n38) 59
[44]Vithanage (n 39)590
[45]AE Okposin, Renewable Energy Utilization and Energy Efficiency in L Atsegbua (edn) *Nigeria in Beyond Fossil Fuel: Renewable Energy Law and Policy,* Fifers Lane Publishers, 126 Ekenwan Road, Benin City Edo State, 144
[46] CJ Lloyd, Renewable Energy and Energy Efficiency in Nigeria in L Atsegbua, *Beyond Fossil Fuel: Renewable Energy Law and Policy,* Fifers Lane Publishers, 126 Ekenwan Road, Benin City Edo State, 436
[47]Ibid 436
[48]Okposin (n45) 145
[49]Shaaban (n 19)974
[50]OL Omoregie, Shale Development vs Renewable energy Resources: Imperatives for Nigeria in L Atsegbua (edn) *Beyond Fossil Fuel: Renewable Energy Law and Policy*, Fifers Lane Publishers, 126 Ekenwan Road, Benin City Edo State, 280
[51] Petroleum Industry Act 2021, S. 309
[52]*ibid s1*

rights over the land, with the state and local government. Extending this right of ownership will reduce agitations by the Niger Delta People. The Act makes provision for the general powers of the Minister.[53]

The PIA has a total of 5 chapters, 10 parts, and 319 sections. The Act provides governance, legal, and regulatory frameworks for the oil and gas industry; it also makes provision for the development of petroleum host communities and to ensure there is a good business environment for operators. The Act provides for the compulsory adoption of a management system and adherence to environmental laws and regulations by petroleum companies. The Act creates two institutions: the Nigerian Upstream Petroleum Regulatory Commission (NUPRC)[54] also known as 'the Commission', and the Nigerian Midstream and Downstream Petroleum Regulatory Authority[55] also known as 'NMDPRA'. These institutions are legal entities that can sue and be sued; they possess the power to purchase, hold, and convey property.[56]. The Commission's duties include, amongst others, establishing and implementing environmental standards, safety, and health for upstream operations. It is believed that when NUPRC and NMDPRA diligently performs her duties by enforcing and implementing the laws, rules, and policies, the environment would be good and safe for future generations, thereby having a good sustainable environment, which is one major advantage that renewable energy has over traditional energy producers, oil and gas.

The Act directs operators in the industry to map out and execute plans for the remediation of the environment impacted by petroleum activities.[57] It ensures the cleaning of all forms of pollution. This is good, as it is in tune with ensuring a good and friendly environment, which is a feature of renewable energy. The PIA makes it mandatory to use money accrued from fines paid as a penalty for remediation of the environment.[58]. This is commendable as it shows good intentions of the lawmakers to ensure a good environment. The PIA aims at encouraging the reduction of gas flaring. In fact, it prohibits venting of gas by providing penalties for defaulters.[59] and ensuring they meet domestic gas supply obligations. It provides for revocation of licences where operators have failed to adhere to international best practice and guidelines or laws regulating the industry.[60] The PIA provides a framework for environmental liability and remediation, and ensures that operators are held liable for environmental damage or pollution.[61]

The PIA's provisions are seen as targeting and emphasizing continuity and sustainability, and a consequent shift to green technology by applying the use of incentives, encouraging renewable energy investment, and incentivizing the adoption and use of green technology. These provisions suggest that the PIA is styled to encourage the shift from oil and gas to renewable energy to achieve sustainability. It has tried to achieve this by ensuring the reduction of gas flaring and punishment for breaches.[62] This engenders economic diversification and environmental protection.

The PIA introduced a new era for host communities as it established the Host Community Development Trust Fund (HCDTF), whose primary objective is to promote sustainable prosperity, provide direct social and economic gains from petroleum to host communities, and to enhance peaceable and harmonious coexistence among operators, government, and host communities. It also creates the machinery to support the development of the host community.[63] It introduced the Hydrocarbon Tax, a new tax regime and a tax on the income of the company. Consequently, introducing a new tax regime. The Act replaced the old petroleum tax laws. It made hydrocarbons, crude, and other associated products, including associated gas, taxable. Gas flaring is an offence; revenue gotten from the penalties will be used for remediation and relief of the impacted host communities[64]. The PIA also makes the host community responsible for protecting oil and gas assets, hence making the host communities liable for sabotage, unrest, disruption of production, etc. This provision faulty. The operators should be given the responsibility to protect their facilities; otherwise, it will give room for the operators to be partial and put all blame regarding the facilities on the host communities where there is theft, leakages, etc.

Environmental Impact Assessment (EIA) Act 1992 CAP E12, LFN 2004

The EIA[65] was enacted to set out the general principles, procedures, and methods to enable the prior consideration of environmental impact assessment on certain public or private projects; to ensure that oil and gas projects in Nigeria are

[53]Petroleum Industry Act 2021, S.3
[54]*Ibid, S.4*
[55]*Ibid, S.29*
[56]*Ibid, s.3.*
[57]*Ibid,102 (1)*
[58] PIA S 104(4)
[59] *Ibid S 105*
[60]*Ibid S.* 96(1) (i)
[61]*Ibid, s* 65-74.
[62]*Ibid* S 9
[63]*Ibid* S. 243 (1) (a-d)
[64]PIA S.10(f), 52(7)d, 104(4).
[65] EIA 1992 CAP E12, LFN 2004

carried out in an environmentally sustainable manner, and to make operators answerable for any degradation or pollution. It ensures operators evaluate the potential impacts of a proposed project. The Act was enacted in line with Principle 17 of the Rio Declaration. The Act makes it mandatory that before gas can be flared, there must be an environmental impact assessment.[66] The Act[67] gives the agency the discretion to permit or refuse to permit the construction of a project. It is believed that the Agency can refuse to grant a permit where, in her judgement, the project will be injurious to the environment. The above should have saved Nigeria from stress, had the agency acted in good conscience in performing its work. It is believed that when due diligence is taken into strict consideration, the agency would see and avert impending actions of operators that would degrade the environment by refusing to permit or grant a licence to construct and operate.

Electricity Act 2023

The Electricity Act 2023 was signed into law on 6th June 2023[68]. It signals a major restructuring of the regulatory framework of the electricity sector and repeals all other and previous Electricity Power Sector Acts. The Act was enacted to be the one single legislation that puts together all laws, rules, and government policy about power and electricity generation, transmission, and distribution. Additionally, it is to allow and give room for the integration of renewable energy into Nigeria's energy mix, etc.[69]. The Act offers direction on striking the balance between utilization and use of natural resources and reduction of carbon emissions, and outlining how Nigeria and the industry can generate, transmit, and distribute adequate power to meet the energy needs. The Act, when enforced, has the ability to entice critical investment for the energy sector. The Act has 233 sections and 22 parts that span through Part 1(Preliminary Provisions), stating the objectives of the Act, which include: providing the ideal legal and institutional framework to leverage the modest gains of the privatised sector of power; promoting policy and regulatory measures to ensure power transmission in Nigeria; making policy, regulating, and improving power generation, etc[70]. Part V of the Act creates the Nigerian Electricity Regulatory Commission, also known as the Commission, as a legal entity that can sue and be sued.[71]. It empowers NERC to perform the following functions: to guarantee and adequately provide electricity, create and promote an efficient electricity industry and market structure, and to ensure good use of resources to produce electricity services. Furthermore, to ensure safety, security, quality, and reliable service in the production and delivery of electricity to consumers, etc[72]. It makes the Hydroelectric Power Producing Area Development Commission a legal body with perpetual succession.[73] The Act provides for the Nigerian Electricity Management Service Agency, Offences and Penalties.[74] Miscellaneous and Supplementary Provisions,[75] and Final Provisions[76].

The Act recognises and has made provisions for renewable energy. It provides for the use of renewable energy as a source and supply for electricity.[77] It also provides that the Commission shall support the development and appropriate use of energy and abide by the provisions of this Act to increase the quota of renewable energy in Nigeria's energy mix by ensuring they are consistent with the Act.[78] The Electricity Act, in trying to encourage the use of renewable energy, has introduced licensing and fee regimes to aid the production of electricity from renewable energy. This Act includes the imposition of duties on the Commission and operators to aid, encourage and promote production and use of electricity from renewable energy. In addition, it made rules for the commercialisation of electricity generated through renewable energy sources and made standards that will support local skills and requirements for renewable energy projects, etc.[79]These provisions are laudable as they signal hope and encouragement to Nigerian states to explore and use electricity generated from renewable energy, which conversely affects the gas industry in Nigeria as it reduces the demand for the use of gas for electricity, consequently leading to a reduction in gas viability, demand, economic importance, etc.

The Commission is also empowered by the Act to ensure that public utilities buy renewable energy-generated electricity at the amount fixed by her, to approve mini-grid and grid connection charges, and to fix the rate for wheeling of electricity from renewable energy.[80] The Act defines commercial activities in the renewables industry to include: generation,

[66]PS Tamuno, 'Legal Response to Gas Flaring in Developed and Developing Countries: A Comparative Analysis of Nigeria, United Kingdom, Norway' (LLM Dissertation Centre for Energy Petroleum and Mineral Law and Policy University of Dundee 2010)
[67]*Ibid,* S 12
[68] Electricity Act 2023 Schedule to the Electricity Bill 2023
[69]Electricity Act, Explanatory Memorandum.
[70]*Ibid*, S 1 (a-g).
[71]*Ibid*, S 33(1).
[72]*Ibid*, S 34 (1) (a-k).
[73]*Ibid*, S 82.
[74]*Ibid*, Part XVIII, S 72.
[75]*Ibid*, XXI.
[76]*Ibid*, Part XXII.
[77]*Ibid*, S 113 (1).
[78]*Ibid*, S 164.
[79]*Ibid*, S 164 (a-e)
[80]*Ibid*, 164 (2) (a-c)

distribution, sales and installation.[81]. It also introduces tax incentives to support the use of renewables.[82] The Act provides for feed-in-tariff rates; it is the Commission's duty to provide the guidelines, rates, and charges for public utilities for renewable energy-generated electricity.[83]. In fixing the rates, the Commission shall consider: the Technology that is being used, the location of the generation machines, rules for operating the specific technology, construction, operation, and commissioning costs, and a reasonable amount of return.[84] In recent years, the focus on renewables has grown stronger and has become a focus of Nigeria's government electricity policy. This has led to the introduction of policy and regulatory instruments geared towards stimulating investment in renewable energy; NERC and the REA have played key roles.

Nigerian Electricity Regulatory Commission Mini-Grid Regulations 2023

The Regulation[85], also known as NERC-R-117-2023, was made by NERC in accordance with the Electricity Act[86] that repealed the Mini-Grid Regulations of 2016 and to boost investment, create a good and friendly environment for investors by reducing administrative burdens for investors. This helps to give investors faster and streamlined application processes, and helps to cover and fill the gaps and shortcomings of previous laws and regulations (2016). Thereby providing greater clarity and strengthening the regulatory framework. The regulation has six (6) chapters, 28 sections, and 28 schedules. It provides for the time within which Consent and Confirmation can be given. It provides for a condition of 15 business days for confirmation or consent to be given by the DisCos before the Commission can grant any mini-grid holder a permit to construct, own, and operate a mini-grid in any underserved area.[87]. This consent is deemed given in the event of the lapse of the affirmation within 15 days. The environment was not left out by the regulations. The regulation makes it mandatory for all mini-grid operators to ensure compliance with environmental laws affecting their operations and makes infraction of the rule's offence punishable by suspension and termination of the permit.[88] The punishment of termination of the permit is a commendable one as it will deter operators from wilfully breaching the laws. Compliance with environmental laws will engender the preservation of the environment and ecosystem. This work advocates for strict enforcement of this provision for use, adherence, and deterrence.

Climate Change Act 2021

The Act[89] provides a framework for the mainstreaming of Climate Change actions. It also provides a carbon budgeting system. It has 8 parts and 36 sections. The Act was enacted to attain lower levels of greenhouse gas emissions (GHG), and green growth and sustainable economic development[90]. It creates the National Council on Climate Change that shall be a body corporate and have the power to sue and be sued, and shall have the power to make policies touching on climate change in Nigeria[91]. The Act establishes a Climate Change Fund.[92] That shall be used to: fund innovative climate change reduction and adaptation projects subject to the approval of the Council; support climate change promotion and information dissemination; conduct assessment of the impact of climate change on communities; give incentives to encourage transitioning to clean energy and a reduction in GHG emissions.[93] It ensures all MDAs create a desk as a mandate for climate integration of climate change activities. Adherence to annual carbon emission reduction targets. It is an offence punishable with a consequence to be prescribed by the council for anyone to act or conduct himself in any manner that will contravene the provisions of this Act or impede the reduction and adaptation measures done by the Act.[94].

National Renewable Energy & Energy Efficiency Policy NREEEP (2015)

About 40% of Nigerian citizens have access to electricity supply, with a population of over 170 million people. Electricity supply hasn't reached the city; hence, people living in the rural area has no or little of it. This scarcity of electricity supply has become a challenge to Nigeria in the face of an abundance of natural resources. Hence, the urgent need to explore other sources of energy. This leaves us with no better option than going and moving to renewable energy sources (sun, wind, biomass) for electricity supply. It is believed that renewable energy as an alternative energy for electricity will be cost-effective and aid the even distribution of electricity to every part of Nigeria, particularly the rural areas. The policy is made to ensure the removal or reduction of the major obstacles to renewable energy and energy efficiency from any

[81]*Ibid*, S 165 (1) (a-d)
[82]*Ibid*, S 166 (1)
[83]*Ibid*, S 168 (2)
[84]*Ibid*, S 168 (3) (a-f)
[85] Nigerian Electricity Regulator Commission Mini-Grid Regulations, 2023
[86]Electricity Act 2023 S 226
[87]NERC Mini-Grid Regulations, 2023 S 7(2)
[88]*Ibid*, S 18
[89]Climate Change Act 2021.
[90]*Ibid*, S 1.
[91]*Ibid*, S 3 (1) (2) (a &b).
[92]*Ibid*, S 15.
[93]*Ibid*, S 15 (2) (f, g, I, & j).
[94]*Ibid* S 34 (1) (2) (a, b & c).

disadvantaged position in Nigeria, be it regulatory or economic. Therefore, it is believed that this policy is aimed at providing a conducive economic and political atmosphere that will encourage renewable energy investment. It aims at ensuring the establishment of a good framework and capacity for addressing the country's electricity supply problems. It also aims at improving energy availability, affordability, and accessibility (energy security). The need to achieve energy efficiency for greater sustainability has led several nations to move to renewable energy as a substitute for gas. It is believed that energy efficiency and renewable energy are twin brothers in the pursuit of clean and greener energy. This duo, in their complementary nature, helps to reduce energy consumption and allows renewable energy to meet its high demand. [95]

A cursory look at the laws, rules, ministries, departments, and policies reveals that very little has been done in regulating renewable energy and energy efficiency in Nigeria. This lacuna calls for urgency and for the cumulative objectives of this policy (National Renewable Energy & Energy Efficiency Policy 'NREEEP') to realign Nigeria with international communities and encourage the use of renewable energy in Nigeria. The fundamentals of this policy are to define the prescribed percentage of electricity to be derived from renewable energy sources every year and the use of Power Production Tax Credit (PCT) and Feed-in tariff (for pricing) as incentives for the production of renewable energy.[96]. The policy on renewable energy sources is geared towards ensuring the under listed: that Nigeria effectively harness and integrate all the renewable source, ensure indigenous and participation of private sector in the development of renewable energy, to encourage the use of efficient renewable energy conversion technologies, to ensure that renewable energy is done in more sociable and socially stable sustainable environment to promote energy storage technology, and to ensure that renewable energy sources get to consumers at the cheapest and cleanest form.[97]. The policy provides for the strategies and objectives of the renewable sources.[98].

Renewable Energy Master Plan (REM) 2006

Nigeria depends on fossil fuels for its energy supply. This has overburdened the petroleum industry in the face of the growing size of its population and high demand for energy supply. Several concerns have been raised about the consequences of this dependence, such as depletion of gas and its devastating impact on the environment. Thus, it has become imperative for an alternative source of energy to be sought after to lessen the pressure on fossil fuels and to provide cheap, reliable energy; hence, renewable energy. It is against this backdrop that the Government of Nigeria, through the agency Energy Commission of Nigeria, created and revised the Renewable Energy Master Plan from the United Nations Development Programme (UNDP) in 2005 and 2012, respectively. The chief aim of REMP is to ensure the constant increase of renewable energy production in achieving poverty reduction and sustainable development. Simply put, REMP was developed to increase the use of energy from renewable sources (clean energy) in a quest for sustainable development.[99] REMP's objectives are to aggregate the vision of the Nigerian state with a view to solving its development problems by encouraging and fast-tracking the use and exploitation of renewable energy[100]. REMP's major objectives are basically anchored on Nigeria's vision and principles, and it targets the National Energy Economic Empowerment Strategy (NEED), National Energy Policy, Millennium Development Goals (MDGs), etc[101]. The plan was established to bring renewable energy into use in electricity grids, buildings, solar, and off-grid electrical systems. REMP is aiming to increase the share of renewable electricity contribution to Nigeria's energy mix from 13% to 36% by 2030. The REMP also outlines various incentives (capital incentives and tax credits) to encourage the use and development of renewable energy.

The entry of renewable energy into the Nigeria Energy mix would bring power sector reform. It will help to remove the monopoly that fossil (gas) holds in the energy sector. It will bring in competition, thereby liberalising the industry and encouraging self-generation of energy by end-users. Renewable energy (off-grid power supply) will help to extend electricity to rural areas where fossil fuel(gas) has not been able to do so under market forces.[102] This work advocates full investment and support in renewable energy development for Nigeria to ensure electricity security.

[95] National Renewable Energy & Energy Efficiency Policy (NREEEP) 2015, S 1.4 2.
[96]*Ibid* Critical Elements of the Policy 1.6, 4.
[97]*Ibid* 2 (1-2.5), The Renewable Energy Master Plan (REMP) Drafting Final Report 2005, Executive Summary, Introduction 10-16
[98]*Ibid* 2 (1-2.5), The Renewable Energy Master Plan (REMP) Drafting Final Report 2005, Executive Summary, Introduction 10-16
[99]The Renewable Energy Master Plan (REMP) Drafting Final Report 2005, Executive Summary, Introduction, 9
[100]*Ibid* 11
[101]*Ibid,* 9
[102]*Ibid,* 13

4. Institutional framework

Federal Ministry of Petroleum Resources

This is a government ministry in charge of the oil and gas sector. It was founded in 1975 and is now headed by President Bola Tinubu as Minister, and has a Minister of State for Petroleum Resources (Oil), Heineken Lokpobiri, and Ekperikpe Ekpo as Minister of State for Petroleum Resources (Gas). The Ministers of State oversee everything. The ministry is saddled with the duty of framing guidelines and policy for the industry. The Ministry serves as the chief and central authority overseeing the industry and has overall regulatory oversight of the industry as a government administrative arm. The MPR has a gas department that liaises with other agencies of government like the Nigerian Upstream Petroleum Regulatory Commission and the Nigerian Midstream and Downstream Petroleum Authority. The Nigerian Upstream Regulatory Commission formulates and supervises policies touching the development and exploitation of oil and gas.[103].

Nigerian Upstream Petroleum Regulatory Commission (NUPRC) 2023

The Nigerian Upstream Regulatory Commission was a creation of the PIA as a juristic person that shall be charged with the technical and commercial management of the upstream sector[104]. One of its main objectives is to ensure that the upstream activities are conducted in an effective, safe, healthy, environmentally friendly, sustainable manner and to encourage strict implementation and adherence to environmental legislation, regulations, and policies for the upstream sector[105]. In the Commission's performance of its function**,** it has formulated several Regulations, culminating in 12 regulations (Nigeria Upstream Petroleum Host Communities Development Regulations 2022; Upstream Petroleum Environmental Remediation Regulation 2024, etc)[106] to properly regulate the industry. The Commission came into force on the 16th August 2021, the same day the PIA came into force, to perform, amongst other things, the duties of the Department of Petroleum Resources (DPR). Hence, replacing the defunct DPR. The NUPRC has its headquarters situated in Abuja, the capital city of Nigeria. For the purpose of the general administration of the Commission, the Act establishes the existence of a Governing Board.[107]

Nigerian Midstream and Downstream Petroleum Regulatory (NMDPRA) Authority

The NMDPRA is an establishment of the PIA to be a body corporate and possess the power to acquire property, sue and be sued; it shall regulate the commercial and technical activities of the sector.[108]. It was established to manage the midstream and downstream sector of the industry.[109] Its main objectives are to ensure that the upstream activities are conducted in an effective, safe, healthy, environmentally friendly, sustainable manner and to promote the supply of gas and oil to the domestic market.[110]. Her other objectives include the strict implementation and adherence to environmental legislation, regulations and policies in the midstream and downstream sector.[111]. In furtherance of the above and in line with the exercise of her powers, the Authority has made some regulations (Gas Distribution System Regulation 2023; Midstream and Downstream Flare Regulation 2023; Midstream and Downstream Petroleum Environment Regulation 2023) to help her manage the sector better.[112]. The Act establishes a Governing Board, also known as the Board, that shall be in charge of the general administration of the sector.[113]

Nigerian Electricity Regulatory Commission (The Commission)

The Commission, also known as 'The Commission ', is created by the Act as a juristic body having power to sue and be sued to acquire property[114]. Its head office is in Abuja; it has zonal and state offices[115]. The Commission was first created in 2005 by the Electricity Power Sector Reform Act 2005[116]. The Commission's main aim is to create and ensure there is a good and friendly environment for investment and to ensure they provide good, reliable, affordable, adequate electricity

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[103]AD Adekunle, 'The Effect of Multiple Regulatory Regimes on the Nigerian Petroleum Industry' *International In-House Counsel Journal* (2008) 1(2) 2.
[104]PIA, 2021 S 4 (1-3)
[105]*Ibid*, S 6 (d & i)
[106]O Okonkwo, 'NUPRC Issues 7 New Regulations for the Oil and Gas Industry' *Nairametrics* 26th May, 2023 < https://www.nairametrics.com/2023/05/26/nuprc-issues-7-new-regulations-for-the-oil-and-gas-industry/ > Accessed 10 February 2024.
[107]*Ibid*, S 11(1)
[108]*Ibid,* S 29 (1,2, & 3) S 31(a)
[109] SC Dike, E Ehie and O Chukwuka, 'Appraising the Layers of Governance under the Petroleum Industry Act 2021' *African Journal of International Energy and Environmental Law* (2023) 6(01) 163.
[110]PIA S 31 (c & d)
[111]*Ibid*, S 31 (k)
[112]*Ibid,* S 32 & 33
[113]*Ibid*, S 34(1)
[114]The Electricity Act 2023 S 31
[115]*Ibid* S 33 (2)
[116]Nigerian Electricity Regulatory Commission < https://nerc.gov.ng/about-nerc/ > accessed 21st October 2025

to meet the needs of electricity users[117]. It is also saddled with the responsibility to license operators, determine operating codes and standards.[118]

National Council on Climate Change (the Council)

The Council was established in September 2022 by the Act to make rules and decisions on all matters relating to climate change[119] . It is a corporate body possessing all the powers of a juristic person.[120]. Its major aim is to ensure Nigeria gets a green and sustainable economy. This aim is achieved by coordinating (between national and state) the council's plan and funds.[121]Making or recommending rules, legislation, policy, etc, to ensure mitigation (finding ways to move to low-carbon and to reduce greenhouse gas emissions) and adaptation to climate change and other activities related to it[122].

5. Impact of Renewable Energy on Nigerian Gas Industry

Demand Impact

Increased consumption of renewable energy sources for electricity reduces the demand and patronage for Nigerian gas.[123] One major area where renewable energy significantly impacts low gas usage in Nigeria is electricity generation.[124]. It is believed that households, healthcare facilities, educational institutions, commercial establishments, and rural communities have started using any of the sources of renewable energy for electricity generation, which has consequently led to low reliance on and patronage of gas for electricity in Nigeria. Low patronage results from the cost-effective nature of renewable energy purchase and maintenance prices, which makes it an alternative to gas because Nigerians are moving and will continue to surge towards buying and using renewable energy because its prices are lower and affordable, and when this happens, there will be low demand and patronage of Nigerian gas.[125] Environmental degradation contributes to low patronage. It is believed that gas emits a small level of carbon dioxide; the emission still contributes to climate change, consequently forcing Nigeria to look into and create high demand for a cleaner energy source (using renewable energy), thereby reducing its quest and use of its gas. The above generally hinges on the fact that novel technologies (renewable energy technology) have the tendency of displacing the already existing technologies; this happens where the novel technologies offer a superior economic or environmental edge.

The emergence of renewable energy in Nigeria is reshaping patronage level on Nigeria gas in regulatory frameworks, consumer behaviour, energy accessibility, industrial energy choices, and investment flows. In this work, patronage generally includes: energy security, Government policy support, Market acceptance of energy technologies, penchant for a particular energy source, etc. In the small business and commercial sector, the new use of blended renewable systems, Battery storage technologies, and Solar photovoltaic systems by some households and small businesses, because of the reduced fuel price, cost of operation, and improved energy independence, has always depended on gas, and gas generators have reduced patronage of gas.[126] Renewable energy's impact on the patronage of gas depends on the geographical and territorial environment and location. Nigerians living in rural areas are likely to use more renewable energy because of its availability, as it can operate off-grid. This, in turn, mitigates patronage of gas because of gas-limited infrastructure and pipeline networks. However, note that this may not be the same with people living in urban areas like Port Harcourt, Lagos, and Abuja, where there is the presence of these infrastructures are present, but high cost and energy security become the issue. Government policies and laws like tax incentives, solar adoption, green financing mechanisms, and feed-in tariffs have made Nigeria surge into renewable purchase and use, thereby making Nigerian gas have low

[117]The Electricity Act 2023 S 34 (1) (a, c & e); <NIGERIAN ELECTRICITY REGULATORY COMMISSION> accessed 22nd October 2025

[118]*Ibid*, S 34 (1) (a-k)

[119]Climate Change Act, 2021 S 3(1); < national council on climate change nigeria - Search> accessed 22 October 2025

[120]*Ibid,* S 2 & 3

[121]*Ibid*, S 4 (a-c) <national council on climate change nigeria - Search> Accessed 22 October 2025

[122]*Ibid,* S 4 (c) <Home - Climate Council> accessed 22 October 2025

[123]OJ Olujobi et al, 'The Legal Regime on Renewable Energy as Alternative Sources of Energy in Nigeria's Power Sector: The Impacts and the Potentials' *Academy of Strategic Management Journal 19 3 2020 11*

[124]HP Ishaku & QY Quadri, 'Modeling Renewable Energy Integration for Nigeria's 2030 Electricity Target Using EnergyPLAN' *Journal of Energy Systems (2025) 9 2 159-171*

[125]I Okwanya, 'Evaluating Renewable Energy Choices Among Rural Communities in Nigeria: An Insight for Energy Policy' *International Journal of Energy Sector Management* (2021) 15(1), 157–172; G Heinemann et al, 'Transforming Electricity Access by Replacing Back-up Generators with Solar Systems: Recent Trends and Evidence from Nigeria' *Renewable and Sustainable Energy Reviews* (2022) 157

[126] US Ahmad & others, Battery Energy Storage System for Building Integrated Photovoltaic Applications' *UMYU Scientifica* (2023) 2 4 102-107; AA Adesanya & JM. Pearce 'Economic Viability of Captive Off-grid Solar Photovoltaic and Diesel Hybrid Energy Systems for the Nigerian Private Sector' *Renewable and Sustainable Energy Reviews* (2019) 114 1-19

patronage. Environmental concerns (Environmental sustainability, carbon emissions, Climate change) have reshaped Nigerians' attitude, patronage, and choice for renewable energy over gas.

Low Revenue Impact

Nigeria depends heavily on exports of oil and gas to fund its budget and expenditure; this means that a decline in the demand and consumption of its gas will weigh down or reduce its exchange power and revenue. Substituting gas with renewable energy in NEICs may potentially decrease dependence on oil and gas consumption and prices. The growing surge and dependence on renewable energy affect the quantum of Nigeria's gas exports to NEICs, hence affecting gas export revenue. The use and total reliance on renewable energy sources will surely affect the level of gas usage. Therefore, when there is low patronage and gas use, revenue is reduced. It is argued that renewable energy consumption negatively impacts and reduces gas export and consequently affects revenue generated therefrom.[127] It is believed that the low revenue of gas in Nigeria may not be unconnected to the reduction in the consumption and export of gas, which is caused by the surge in the consumption of renewable energy. The decline in gas revenue may not stem from low federal government revenue but includes individuals and organizations, because the increase in renewable energy consumption may reduce gas exploration activities, which may result in loss of jobs.

Low Investment Impact

Nigeria government has invested heavily on her gas industry, with huge gas reserves and revenue generated from the industry. It does appear that Nigeria's investment in the gas industry will not stop so soon. However, the surge in investment in renewable energy sources is deterring Nigeria from continuing to make huge investments in the gas industry because of fear of low income. The uncertainties of continuous profit-making from the gas industry because of the emergence of renewable energy are forcing Nigeria to stop or reduce heavy investments in the gas industry. Low funding may also come as a result of the low revenue from gas. Low revenue from gas may suggest that the government may not have the economic power to finance other facets of its economy: health care, education, social welfare and infrastructure. One major factor affecting government funding is capital reallocation, wherein governments, non-governmental organisations and global investors try to consider the environment, decarbonization and the climate in choosing what to invest in. As a result of this priority, they may shift the revenue meant for gas investment to renewable energy sources. Hence, funding for the gas industry. If the government tends to enforce climate targets and green energy goals, it will certainly increase its laws and funding towards renewable energy technologies, hence reducing its funding for natural gas.

The government's increasing investment in renewable energy technologies enhances their competitiveness and expands their contribution to the national energy portfolio. As renewable energy secures a progressively larger share of the energy mix, the demand for natural gas, particularly within the electricity generation sector, is likely to decline. This demand reduction diminishes the economic attractiveness of the natural gas industry, thereby reducing the government's incentive to allocate substantial financial resources towards its development and expansion. Furthermore, the sustained reduction in natural gas utilisation is expected to suppress production volumes, domestic consumption, and export performance, ultimately eroding the fiscal revenues generated from the sector. Consequently, declining revenue streams may compel governments to reallocate budgetary resources away from the natural gas industry in favour of renewable energy technologies considered to be more economically viable, environmentally sustainable, and strategically aligned with long-term national energy transition objectives.

Technological advancements have further accelerated this investment shift. For the past decade, the cost of electricity generated from solar and wind energy has declined substantially due to improvements in manufacturing efficiency, economies of scale, and technological innovation. In many regions, renewable energy has become more cost-effective than constructing new gas-fired power plants. As renewable technologies become increasingly competitive, governments and investors perceive them as offering superior long-term returns with lower operational and environmental risks. This economic advantage has resulted in a reallocation of capital away from natural gas infrastructure toward renewable energy generation, battery storage systems, and smart grid technologies.

6. Conclusion and Recommendations

This study reveals that renewable energy development presents both a challenge and an opportunity for Nigeria's natural-gas industry. Although Nigeria's substantial gas resources remain important to addressing its persistent electricity deficit and supporting industrial development, continued reliance on fossil fuels, gas flaring, and carbon-intensive energy production is not in tandem with Nigeria's long-term environmental and energy-security objectives. The appropriate approach is therefore not the immediate abandonment of natural gas, but a gradual, and legally regulated transition

[127]BR WAZIRI, A Hassan, R Kouhy, 'The Effect of Transitional to Renewable Energy Consumption on the Nigerian Oil and Gas Exports' International Journal of Energy Sector Management, 12 4 507–524.emerald.com 2018 < https://doi.org/10.1108/IJESM-11-2017-0010 > < https://www.emerald.com/ijesm/article-abstract/12/4/507/129044/The-effect-of-transitioning-to-renewable-energy?redirectedFrom=fulltext > Accessed 7th August 2025

towards a diversified energy economy. Nigeria has established important legal and institutional foundations for this transition through the Petroleum Industry Act 2021, Climate Change Act 2021 and Electricity Act 202. These laws provide mechanisms for gas-flaring reduction, environmental protection, renewable-energy development and low-carbon growth. However, the principal weakness lies in implementation, institutional coordination, investment conditions and enforcement, rather than in the complete absence of legislation.

The increasing deployment of renewable energy will inevitably affect gas demand, electricity generation, investment patterns and government revenue. Nevertheless, this should be seen as an opportunity for the gas sector to reduce wasteful practices, particularly gas flaring, promote higher-value utilisation of gas and support industrialisation while renewable energy progressively expands. Accordingly, Nigeria should pursue energy diversification rather than energy replacement. Natural gas should function as a transitional and strategic energy resource, while renewable energy assumes an increasing role in electricity generation and energy access. This requires a coherent legal framework supported by effective regulatory coordination, bankable investment incentives, stronger environmental enforcement, and adequate protection for affected communities and workers. Ultimately, the success of Nigeria's energy transition will depend not on the volume of legislation enacted, but on its practical capacity to deliver reliable electricity, environmental protection, investment, employment, and sustainable development. The law must therefore serve as an active instrument for transforming Nigeria's energy sector. A well-regulated transition towards a gas-and-renewables energy economy offers the most sustainable means of balancing energy security, economic development, environmental protection and intergenerational justice. The following measures are necessary:

Enact a comprehensive Renewable Energy and Energy Efficiency Act: There is an urgent need to enact a 'Renewable Energy and Energy Efficiency Act' that will include renewable portfolio obligations, feed-in tariffs, net-metering rules, tax and customs incentives, carbon-credit mechanisms, energy-storage standards and clear provisions for mini-grids and off-grid systems rather than continuing to rely on provisions scattered across the Electricity Act 2023, the Climate Change Act 2021, policies, regulations and administrative instruments. This creates uncertainty for investors and makes implementation dependent upon the discretion and capacity of several institutions. The legislative objective should therefore be to move renewable energy from a mere policy aspiration to an enforceable statutory obligation.

Strengthen Coordination and Reduce Institutional Fragmentation: To ensure collaboration within the institutional framework (the Energy Commission of Nigeria, NERC, NUPRC, NMDPRA, the Council, etc) regulating the industry to ensure optimal administration, and mitigate overlapping duties that make the industry weak and uncertain for investors and cause unnecessary delays. Better still, create an agency to coordinate these institutions to work as one.

Adopt an Unbiased and Gradual Transition from Gas to Renewable Energy: Nigeria should adopt a just, gradual, and well-managed transition from natural gas to renewable energy, rather than seeking the immediate displacement of gas. Given Nigeria's substantial natural-gas resources and its continued dependence on gas for electricity generation and industrial activities, gas should remain a transitional and balancing fuel while renewable-energy capacity is progressively expanded. The objective should be to distinguish between the wasteful use of gas, such as routine gas flaring and inefficient captive generation, and its strategic use for reliable electricity and productive economic activities. This approach would prevent the transition from creating a new energy crisis while simultaneously preparing Nigeria for a lower-carbon energy economy.

Make Renewable-Energy Investment Economically Attractive and Legally Predictable: The key barriers to the advancement of renewable energy in Nigeria extend beyond the availability of natural resources. They include inadequate financing, regulatory uncertainty, poor infrastructure, currency risks and weak enforcement of existing laws. Government should therefore establish a stable investment framework through appropriate tax incentives, concessional financing, government guarantees, import-duty relief for renewable-energy equipment, accessible land arrangements and standardised power-purchase agreements.

Strengthen Enforcement, Environmental Accountability and Energy Justice: Nigeria must strengthen enforcement, environmental accountability and energy justice. The fundamental problem is not necessarily the absence of legislation, but inadequate implementation, monitoring, institutional capacity and accountability. Institutions such as NUPRC, NERC and the National Council on Climate Change already possess important regulatory and coordinating responsibilities in relation to environmental protection, energy regulation and climate action. What is required is stronger enforcement of these mandates.

There should be effective monitoring of gas flaring, methane emissions, environmental remediation, renewable-energy standards and compliance with regulatory requirements. Regulators should publish regular compliance reports, impose meaningful sanctions for violations and ensure that environmental penalties are properly channelled towards remediation and affected communities. More importantly, Nigeria's energy transition must be guided by the principle of energy justice. Host communities, rural populations, petroleum-sector workers and electricity consumers should not bear a disproportionate share of the costs of transition. Renewable-energy programmes should therefore prioritise communities with limited access to reliable electricity, while workers affected by the decline of petroleum-related activities should receive retraining and opportunities for employment in emerging renewable energy industry.