






LEGALLY GREEN: NAVIGATING NIGERIA'S CLEAN ENERGY TRANSITION IN THE POST-PANDEMIC ERA

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The Clean Energy movement has emerged as a front-burner issue in conversations about global warming, especially in the wake of the COVID-19 outbreak, which significantly disrupted energy markets and renewable energy development. This paper critically explores Nigeria's legal and regulatory frameworks guiding its clean energy transition in the post-pandemic era. Despite the global call for decarbonization through climate governance mechanisms such as the Paris Agreement and the Kyoto Protocol, fossil fuels remain dominant, posing environmental and economic challenges. The pandemic intensified these issues by disrupting supply chains, reducing investments in renewable energy, and shifting policy focus toward immediate health and economic recovery. Nigeria, heavily reliant on crude oil exports, experienced severe economic strain, raising urgent questions about its readiness to embrace renewable energy pathways. The study examines national legal instruments including the 1999 Constitution, the 2023 Electricity Act, the Climate Change Act 2021, etcetera. The analysis reveals a promising legal landscape, especially at the international and national levels. However, there are still problems like weak laws and policies, resistance to change, low public support and involvement, lack of education and awareness, just transition issues, and concerns about incentives and investment risks. This research emphasizes the need for reduced reliance on fossil fuels, stronger implementation strategies, stakeholder education, and financial incentives to ensure a resilient and sustainable energy future in Nigeria.

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1. INTRODUCTION

Climate change has aggravated world concern and this has made obvious, the urgency of a worldwide green energy transition.¹ However, the COVID-19 pandemic has in no small way obstructed renewable energy development,² thereby making the future of the energy transition seem unascertainable. Various mechanisms in place facilitate the energy transition such as carbon pricing and levies imposed on environmental ills.³

Currently, the global energy system is largely dominated by fossil fuels, accounting for more than half of the total supply of energy.⁴ Uncontrolled and unsustainable use of fossil fuels has led to multifaceted challenges across the globe.⁵ An example is the increasing imbalance in the supply versus demand aspects of the energy market globally,⁶ the risk of depletion in oil reserves,⁷ greenhouse gas emissions,⁸ etcetera. Further to these challenges, global warming has surged to record high levels because of

¹ Jinfang Tian, Longguang Yu, Rui Xue, Shan Zhuang and Yuli Shan, 'Global Low-carbon Energy Transition in the Post-covid-19 Era' (2022) 307 *Applied Energy* 1; A Pegels and T Altenburg, 'Latecomer development in a "greening" world: Introduction to the Special Issue' (2020) 135 *World Development* 1.

² RM Elavarasan, R Pugazhendhi, T Jamal, J Dyduch, MT Arif and NM Kumar 'Envisioning the UN Sustainable Development Goals (SDGs) through the lens of energy sustainability (SDG 7) in the post-COVID-19 world' (2021) 292 *Appl Energy Article* 116665

³ Pegels and Altenburg (n3) 2.

⁴ Jerry L Holechek, Hatim ME Geli, Mohammed N Sawalhah and Raul Valdez, 'A Global Assessment: Can Renewable Energy Replace Fossil Fuels by 2050?' (2022) 14 *Sustainability* 1.

⁵ Shaye Wolf and others, 'Scientists' warning on fossil fuels' (2025) 5 *Oxford Open Climate Change* 1; Melissa Denchak, 'Fossil Fuels: The Dirty Facts' (Natural Resources Defense Council, 1 June 2022) <<https://www.nrdc.org/stories/fossil-fuels-dirty-facts>> accessed 06 May 2025.

⁶ J Li, W Wei, W Zhen, Y Guo, B Chen, 'How green transition of energy system impacts China's mercury emissions' (2019) 7 *Earth's Future* 1407-1416.

⁷ G Bettini, L Karaliotas, 'Exploring the limits of peak oil: Naturalising the political, de-politicising energy' (2013) 179 *Geograph J* 331-341.

⁸ R McLellan, 'Living planet report 2014' (2014) *Global Footprint Network*

monstrous levels of CO₂ emitted from fossil fuel consumption.⁹ If CO₂ emission rates persist at this rate, climatic conditions are projected to reach an estimated 1.5 °C between the year 2030 and 2052.¹⁰ The effect of global warming endangers the daily living and economic activities of a massive number of the world's population.¹¹

As a way of dealing with the issues associated with traditional energy consumption, various countries have responded to this environmental threat by adopting economic, legal and policy measures such as Emission Trading Systems.¹² There is increased advocacy for the widespread proliferation and adoption of clean energy as opposed to the unhealthy sustenance of fossil fuel consumption.¹³ Within the comity of nations, the Paris Agreement and its Kyoto Protocol feature as widely accepted legal instruments that shape international and domestic climate governance activities, thus facilitating the transition to cleaner energy sources.¹⁴ The clean energy movement can be regarded as a driver of economic growth in countries.¹⁵

The energy shift development was inevitably impeded by the shockwaves that COVID-19 sent, which reverberated throughout the entire energy

⁹ B Meng, Y Liu, R Andrew, M Zhou, K Hubacek and J Xue, 'More than half of China's CO₂ emissions are from micro, small and medium-sized enterprises' (2018) 230 *Appl Energy* 712-725.

¹⁰ S Fawzy, AI Osman, J Doran and DW Rooney, 'Strategies for mitigation of climate change: A review' (2020) *Environ Chem Lett* 1-26

¹¹ Q Wang, B Zhou, C Zhang, D Zhou, 'Do energy subsidies reduce fiscal and household non-energy expenditures? A regional heterogeneity assessment on coal-to-gas program in China' (2021) 155 *Energy Policy*, Article 112341

¹² Y Sun, J Xue, X Shi, K Wang, S Qi and L Wang, 'A dynamic and continuous allowances allocation methodology for the prevention of carbon leakage: Emission control coefficients' (2019) 236 *Appl Energy* 220-230

¹³ D Wan, R Xue, M Linnenluecke, J Tian and Y Shan, 'The impact of investor attention during COVID-19 on investment in clean energy versus fossil fuel firms' (2021) 101955 *Finance Res Lett*

¹⁴ JK He, 'Global low-carbon transition and China's response strategies' (2016) 7 *Advanced Climate Change Research* 204-212; J Nieto, Ó Carpintero, LJ Miguel and I de Blas, 'Macroeconomic modelling under energy constraints: Global low carbon transition scenarios' (2020) 137 *Energy Policy*, Article 111090.

¹⁵ N Singh, R Nyuur, B Richmond, 'Renewable energy development as a driver of economic growth: Evidence from multivariate panel data analysis' (2019) 11 *sustainability* 11.

industry.¹⁶ Concerns over the following the pandemic shift in energy intensified.¹⁷ Following the pandemic proclamation, countries all over the world started a new phase of pandemic mitigation and management, which resulted in unexpectedly severe restrictions on domestic and international movement and economic activity.¹⁸ Many oil-producing countries lost their grip over the energy market thus resulting in the consistent reduction of the oil price.¹⁹ The reduction in oil prices gave traditional energy a competitive edge over renewable energy. Although the COVID-19 virus was effectively contained and there were economic losses,²⁰ the decline that followed global trade was a colossal loss for the clean energy industry worldwide. Employees were not spared and high percentages of clean energy equipment development and other related activities came to a standstill.²¹

COVID-19 has had a significant impact on the development of clean energy.²² Following the global epidemic, several nations altered their financial model by spending more on the medical and health industry and, in turn, withdrawing funds and making investments in returns and

¹⁶ J Ke-Jun, '1.5°C target: Not a hopeless imagination. Advances' (2018) *Clim change* 93-94; H Zhang, J Yan, Q Yu, M Obersteiner, W Li and J Chen, '1.6 million transactions replicate distributed PV market slowdown by COVID-19 lockdown' (2021) 283 *Appl Energy* 116341.

¹⁷ Goodrich G The Impact of COVID-19 on Africa's Energy Transition. At <<https://www.africaoilandpower.com/2020/05/11/the-impact-of-covid-19-on-africas-energy-transition/2020>> accessed 13th of April 2025.

¹⁸ PM Forster, HI Forster, MJ Evans, MJ Gidden, CD Jones and CA Keller, 'Current and future global climate impacts resulting from COVID-19' (2020) 19 *Nat Clim Change* 913-919.

¹⁹ FitchRatings. Oil and Coronavirus Shocks Add Pressure for MEA Sovereigns. At <<https://www.fitchratings.com/research/sovereigns/oil-coronavirus-shocks-add-pressure-for-mea-sovereigns-10-03-20202020>> accessed 13th April 2025.

²⁰ D Guan, D Wang, S Hallegatte, SJ Davis, J and Huo, S Li, 'Global supply-chain effects of COVID-19 control measures' (2020) *Nature Human Behaviour* 1-11.

²¹ BK Sovacool, DF Del Rio and S Griffiths, 'Contextualizing the Covid-19 pandemic for a carbon-constrained world: Insights for sustainability transitions, energy justice, and research methodology' (2020) 68 *Energy Res Social Sci Article* 101701

²² JW Goodell, 'COVID-19 and finance: Agendas for future research' (2020) 35 *Finance Res Lett*, Article 101512

sustainability initiatives.²³ To tackle economic issues, several nations aggressively pursued successful economic recovery solutions. Notwithstanding increased requests for green recovery plans, there were constraints in the implementation of the announced stimulus plans, and a substantial percentage of energy investment structures remained dominated by fossil fuels. Such recovery plans tilt towards adverse outcomes for climate change and energy transition in the long term, weakening the sustainability and resilience of the world economy.

Nigeria was not exempted from the effects of the pandemic as its economy declined due to the fall in global crude oil prices, thus, making energy transition a necessity in the post-pandemic era.²⁴ Questions abound as to whether Nigeria is truly ready to transition to renewable clean energy, paying cognizance to the cost of production, installation and maintenance and other related activities to aid the development of renewable energy.²⁵ It is these questions that have inspired this research endeavour in a bid to evaluate Nigeria's current position and potential in achieving its energy transition in the post-pandemic era.

This paper will examine the regulatory framework governing the clean energy transition as well as the challenges that hinder a speedy realisation of the clean energy transition. Part A is the introductory aspect while Part B contains a brief exposition of relevant literature, Part C will consider some legal frameworks and policy documents which are relevant to the clean energy transition in Nigeria. Part D will consider some challenges militating against the clean energy transition in Nigeria and Part E—the final part—will provide the conclusions and recommendations.

²³ P Jiang, Y Van Fan, JJ Klemeš, 'Impacts of COVID-19 on energy demand and consumption: Challenges, lessons and emerging opportunities' (2021) 285 *Appl Energy* 116441

²⁴ Olusola Joshua Olujobi, Elizabeta Smaranda Olarinde, Tunde Ebenezer Yebisi and Uchechukwu Emena Okorie, 'Covid Pandemic: The Impacts of Cruel Oil Price Shock on Nigeria's Economy, Legal and Policy Options' (2022) 14 *Sustainability* 18.

²⁵ Momodu Kassim-Momodu, Abubakar Ali Chifwang and Safiyyah Omorinsola Alimi, 'An Unconventional Clarion Call for a New Energy Order: Is Covid-19 a Blessing for the Nigerian Energy Sector' (2020) *Global Energy Law and Sustainability* 1(2)

2. LITERATURE REVIEW

Tikristini Olawale analysed macroeconomic policy responses by the Nigerian Government to the COVID-19 health crisis to see if they helped in achieving climate targets.²⁶ She highlighted Nigeria's economic and health challenges resulting from the COVID-19 health crisis.²⁷ The author examined three national policies which, if properly implemented, would help achieve economic recovery.²⁸ The author recommended that the Government create public awareness of climate change adaptation and mitigation measures.²⁹ She further recommended investments in renewable energy, capacity building, climate-smart agriculture and economic diversification.³⁰ It must be noted that the author failed to acknowledge the role of regulatory instruments in realising Nigeria's clean energy. She failed to consider the role certain environmental laws played in formulating the Nationally Determined Contributions (NDC) which she juxtaposed against Nigeria's macroeconomic policies. These laws include the United Nations Framework Convention on Climate Change,³¹ the Kyoto Protocol,³² the Paris Agreement³³ and the Climate Change Act 2021 ('CCA').³⁴ Some of these laws would be considered albeit on other aspects that are instrumental to achieving Nigeria's clean energy future.

Carlo Papa *et al* expatiated the need for a functioning society to have electricity infrastructures as it is major in running the daily activities of

²⁶ Tikristini Olawale, 'Nigeria's post-Covid-19 Macro Economic Policies: Are the Climate Change Friendly?' (2023) <<https://idl-bnc-idrc.dspacedirect.org/server/api/core/bitstreams/5d938a14-4a14-45cd-aa28-ad181d0baf50/content>> Accessed 22 April 2025

²⁷ *ibid*, 7.

²⁸ Economic Recovery and Growth Plan, Economic Sustainability Plan and National Development Plan.

²⁹ *ibid*, 14.

³⁰ *ibid*

³¹ United Nations Framework Convention on Climate Change ('the Convention'), art. 4(2)(a).

³² Kyoto Protocol, Annex B.

³³ Paris Agreement, art. 4.

³⁴ Climate Change Act 2021, s.4(p).

individuals in the society.³⁵ The authors give statistical analysis of energy consumption patterns and trends during the pandemic in various countries including France, India, The United Kingdom, The United States and Italy amongst other countries. The authors mention the need for human labour in the sustainability of the power sector and how the pandemic affected the power sector seeing the limitations in activities and maintenance. The authors add that in fostering sustainability in the power sector with regards to the use of clean energy, attention must be placed on post-covid recovery and long-term solutions should be provided with the harsh realities brought about by the pandemic.

In addition, Norbert and Gogo³⁶ in their work analyzed the impact of the pandemic in Nigeria using the city of Lagos as a case study. A striking feature of this work is that the authors analysed the electricity demand in the residential and commercial sectors, and made a scenario touching three phases: electricity demand before the pandemic, electricity demand in partial lockdown and electricity demand in complete lockdown. Their work noted the shift in electricity usage manifesting as reduced electricity consumption in commercial or industrial premises as opposed to the increased electricity consumption in residential areas.³⁷ This shift was brought about by different factors such as professional services adopting work-from-home (WFH) policies and increased energy-intensive household tasks.³⁸ These scholars further noted that energy transition could occur in three contexts: momentary energy transition, temporary energy transition and permanent energy transition. Momentary energy transitions are short-term shifts in energy use behaviour triggered by rules, often lasting less than a year. These changes are typically not sustained, as consumers revert to previous habits once the external pressure is removed and there is no intrinsic motivation for continued change. Temporary energy transitions involve commitment from energy users and

³⁵ Carlo Papa, Giuseppe Montesano, Nicolo Sartori Carlo Napoli and Mirko Armiento, 'A Clean and Resilient Electricity Sector for a Post-Covid Recovery' *The Oxford Institute for Energy Studies* (2020) *A Quarterly Journal for Debating Energy Issues and Policies* 33.

³⁶ Norbert Edomah and Gogo Ndule, 'Energy Transition in a Lockdown: An analysis of the impact of Covid-19 on changes in Electricity demand in Lagos Nigeria' (2020) *2 Global Transitions* 127-137.

³⁷ *ibid*, 138.

³⁸ *ibid*, 132.

stakeholders, leading to changes in behaviour that, while lacking regulatory support, can persist for several years due to voluntary commitment. In contrast, permanent energy transitions result from deliberate behavioural shifts or the adoption of new technologies, reinforced by regulatory measures. The permanent energy transition is relevant to this study as it highlights the relevance of the law in shaping energy consumer behaviours and attitudes. Interestingly, this point was not underscored by the authors and this is a gap that this study intends to fill by reproducing and analysing legal provisions that can effectively foster an accelerated transition to clean energy through the moulding of energy consumer preferences.

Finally, Hongfang Lu, Xin Ma and Minda Ma³⁹ pointed out that the pandemic had considerable damage on every industrial sector around the globe, particularly the pillar of economic development, the energy sector, stating that the energy sector experienced a decline during the global pandemic. The authors reviewed the impact of COVID-19 on the energy industry worldwide in nexus with its demand, price, government policy, employment and countermeasures. The authors' work centres on the two largest energy countries in the world, China and The United States of America. They mentioned the ongoing work to address climate issues and the urgency of it despite the impact of the virus and the need to transition to clean energy.

3. REGULATORY FRAMEWORK

United Nations Framework Convention on Climate Change ('the Convention')

The Convention was made to keep greenhouse gas levels in the atmosphere at levels which would avoid harmful human impacts on the climate.⁴⁰ The signatories to the Convention are enjoined to adopt and implement measures that predict, forestall and minimise the causes of

³⁹ Hongfang Lu, Xin Ma and Minda Ma, 'Impact of the Covid-19 Pandemic on the Energy Sector' Research Gate (2021) Journal of Zhejiang University – Science A; Applied Physics & Engineering.

⁴⁰ United Nations Framework Convention on Climate Change, art. 2

climate change and mitigate its effects.⁴¹ Of particular relevance to the clean energy transition trend is Article 4(1)(c) which directs that signatories to the Convention promote the development, application and transfer of technologies that manage GHG emissions in sectors including energy, transport, industry, agriculture, forestry and waste management sectors. The signatories are also directed to promote education and public awareness relating to climate change under Article 4(1)(i). Under Article 4(4) developed countries listed in Annex II are obligated to assist developing nations that are especially vulnerable to the adverse effects of climate change. The support is provided through financial resources and technology transfer to enhance the resilience and adaptive capacity of these developing countries. This is a particularly interesting aspect of the Convention as there are mixed views regarding the expected assistance of the developed parties especially in areas like finance and the transfer of clean energy technologies with countries in the Global South maintaining the view that those in the Global North are not doing enough to assist the latter.⁴² Under Article 6 the signatories are directed to undertake education, training and public awareness activities on climate change and its effects and this provision has been replicated in Nigeria's Climate Change Act. The Convention represents one of the major international legal instruments that has inspired the clean energy transition across the globe.

Kyoto Protocol

The Kyoto Protocol was made under Article 17 of the United Nations Framework Convention on Climate Change. Article 10(c) of the Kyoto Protocol requires the parties to work together to support the sharing and use of environmentally friendly technologies, especially in developing countries. This includes helping with funding, creating good policies, and encouraging both public and private efforts to make these technologies

⁴¹ United Nations Framework Convention on Climate Change, art. 3(3)

⁴² Kujo Elias Mcdave, 'Intellectual Property Rights as a Key Driver in Climate Change Mitigation' 2022 (2) NAUJILJ 89; Segun Adewole, 'Climate change: Africa cheated, oppressed, lied to by rich nations —Buhari' (Punch Newspapers, 9 November 2021) <<https://punchng.com/climate-change-africa-cheated-oppressed-lied-to-by-rich-nations-buhari/>> Accessed 18 May 2025

easier to access and use. Article 11(2)(a) and (b) directs developed countries to assist developing countries with financial resources to meet the developing countries. These provisions are instrumental in the clean energy transition as without the transfer of technology and financial assistance, developing countries like Nigeria would find it difficult to achieve their clean energy transition programme.

The Paris Agreement

Like the United Nations Framework Convention on Climate Change and the Kyoto Protocol, the Paris Agreement recognises the importance of technology transfer in the reduction of carbon emissions.⁴³ Developed countries are also mandated to provide financial resources to developing countries concerning mitigation and adaptation strategies under in continuation of their existing obligations under the United Nations Framework Convention on Climate Change.⁴⁴ Under Article 11(1), the capacity of developing countries is expected to be developed such that these countries shall take strong action on climate change. This includes helping these developing countries adapt and reduce carbon emissions, use new technologies, access climate funding, and improve education, training, public awareness, and information sharing. These provisions are certainly very helpful to developing countries like Nigeria as they can aid in the acceleration of the transition to clean energy. Sadly, these laudable provisions appear to be mere paper tigers with there being very little assistance being extended to countries in the Global South like Nigeria.⁴⁵

Constitution of the Federal Republic of Nigeria 1999 ('the Constitution')

Section 1(1) established the supremacy of the Constitution and it is the basic norm which acts as the foundation for all laws in Nigeria. It established legislative, executive and judicial powers and authorities as found in sections 4, 5 and 6 of the Constitution. Of relevance to to this study are the totality of the provisions of section 4 which apporitions power to make laws for the Federation and semi-autonomous units

⁴³ Kyoto Protocol, art. 10.

⁴⁴ Kyoto Protocol, art. 9(1).

⁴⁵ Adewole (n44).

(states) to both the National Assembly and State Houses of Assembly, respectively. A more detailed identification of these legislative powers may be found in the exclusive and concurrent legislative lists.⁴⁶ As it relates to energy transition, the exclusive list has tenuous items which may be linked to energy transition matters such as items 37 (meteorology), 39 (mines and minerals, including oilfields, oil mining, geological surveys and natural gas) and 41(nuclear energy) of the Exclusive Legislative List. What is interesting about the Constitution is that there are more relevant provisions that apply to the subject of energy transition which may be found in section 20 of the Constitution. Briefly put, section 20 of the Constitution entrusts the protection of Nigeria's environment to the Nigerian government, however, this provision merely functions as a paper tiger as the entire chapter Chapter II encapsulating section 20 is unenforceable in law based on the defeatist interpretation of section 6(6)(c) of the Constitution. The Constitution requires serious reforms if the Nigerian Government is to go beyond paying lip service to the energy transition plan.

Petroleum Industry Act 2021 (PIA)

The PIA is the pre-eminent law regulating petroleum operations in Nigeria. It contains various provisions which are relevant to the transition to clean energy. Such provisions include section 3(1)(c) of the PIA which directs the Honourable Minister of Petroleum Resources—traditionally Nigeria's President—to relay information about occurrences in the petroleum industry to Nigeria's government. Certainly, this provision helps in putting Nigeria on the alert about decarbonisation activities and the low-carbon economy. The PIA also created two regulators that have responsibilities which can foster the achievement of Nigeria's energy transition. These are the Nigerian Upstream Petroleum Regulatory Commission⁴⁷ (NUPRC) and the Nigerian Midstream and Downstream Petroleum Regulatory Authority (NMDPRA).⁴⁸ NUPRC and NMDPRA have potentially friendly energy-transition duties as may be gleaned from provisions like sections 7(b) & (c) and 32 (bb) of the PIA. Other

⁴⁶ Constitution of the Federal Republic of Nigeria 1999, s. 4(3) and (7).

⁴⁷ Petroleum Industry Act, 2021, s. 4(1).

⁴⁸ *ibid*, s. 29(1).

environmentally protective provisions exist in places like sections 102 (environmental management) and 103 (financial contribution for remediation of environmental damage). No doubt, the PIA does possess helpful provisions that safeguard the environment however, concerning the energy transition movement, it seems like the PIA was enacted to maintain the status quo the exploitation of Nigeria's fossil fuels reserves.

Electricity Act, 2023 ('Electricity Act')

From the perspective of the Electricity Act, the most pertinent energy transition measure seems to be renewable energy as can deduced from the provisions of sections 1(n) and (o); section 3(2)(a) and (e); section 5(2)(e), (h), (i), (l), (m) and (n); section 34(i), section 143(e), (f), (g), (h), (i) and (j) and; part XVII (sections 164 to 171). Section 232 defined renewable energy resources to mean natural resources like sunlight, wind, rain, ocean tides, and geothermal heat from the Earth's interior. They are naturally occurring and are not depleted when used. These natural resources when processed can produce renewable energy products.⁴⁹ The Electricity Act has as one of its objectives, the promotion of education on renewable energy production and consumption for the benefit of increased electricity generation and consumption from renewable sources.⁵⁰ This provision is quite helpful as this study identified low-level awareness and a gap in public education as hurdles to overcome in the energy transition. Section 3(2)(a) and (e) have provisions that mandate the development of Nigeria's electricity sector based on renewable energy sources. This fits in very well with the permanent energy transition concept we discussed in the literature review when critiquing Norbert and Gogo's work. Section 5(2)(e), (h), (i), (l), (m) and (n) deals with policy, research, capacity development and promotion matters. All of these are very relevant to the energy transition movement and certainly underscore the seriousness of the Nigerian government in transitioning to cleaner sources of energy albeit in the electricity industry. This willingness to transition has been recast as a duty of the Nigerian Electricity Regulatory Commission in section 34(i). Further to this, there is the obligation of the Rural

⁴⁹ Renewable energy products are goods and service produced from renewable energy. See section 232 of the Electricity Act, 2023.

⁵⁰ Electricity Act, 202, s.1(n) and (o).

Electrification Fund to conduct research on renewable energy matters and foster the adoption of renewable energy in marginalised communities.⁵¹ Perhaps, the most important provisions in the Electricity Act that support the clean energy transition may be found in part XVII (sections 164 to 171). Collectively, sections 164 to 171 obligate the Nigerian Electricity Regulatory Commission to adopt measures that promote the development and utilisation of renewable energy. Tax incentives are provided by section 166 of the Electricity Act open to incentivise the implementation of renewable energy projects in Nigeria. From a comprehensive analysis of the Electricity Act done in this study, it would seem that the Nigerian government certainly is not paying lip service to the issue of low-carbon energy transition concerning the Nigerian Electricity Supply Industry.

Energy Commission of Nigeria Act

Section 1(1) of the Energy Commission of Nigeria Act established the Energy Commission of Nigeria ('the Commission'). The Commission is tasked with *inter alia* setting guidelines for the use of various energy types.⁵² The Commission also is charged with recommending the exploitation of new sources of energy when necessary.⁵³ The Commission has the responsibility of formulating policies on national energy and preparing periodic master plans for the development of energy in Nigeria.⁵⁴ Under this statutory injunction, the Commission formulated the National Energy Policy of 2003, National Energy Masterplan, Renewable Energy Masterplan and National Energy Efficiency & Conservation Policy.⁵⁵

Climate Change Act 2021 ('CCA')

The CCA is one of the most important legislation relevant to the energy transition movement in Nigeria. The Act was enacted in 2021 to foster the realisation of low carbon emissions and an environmentally sustainable

⁵¹ *ibid*, s. 143(e), (f), (g), (h) and (i).

⁵² Energy Commission of Nigeria Act, s. 5(e).

⁵³ *ibid*, section 5(d)(i).

⁵⁴ *ibid*.

⁵⁵ Energy Commission of Nigeria, 'Energy Policy and Planning' <https://energy.gov.ng/policy_planning.php> Accessed 16 May 2025

society. The CCA established the National Council on Climate Change ('the Council') and tasked it with the performance of various duties which collectively fulfil the low-carbon emission goal.⁵⁶ Section 27 of the Act mandates the Council to promote and adopt nature-based measures which would reduce GreenHouse Gas emissions (GHG) and mitigate climate change in Nigeria. Certainly, these measures can be construed to accommodate renewable energy sources and products, which is very useful in fast-tracking the realisation of net zero emissions projected for the year 2050 - 2070.⁵⁷ The Act also introduced novel measures like a carbon budget which both the Federal Ministries of Environment and Planning are responsible for under section 19(1). The carbon budget is an approved quantity of GHG emission that is acceptable over a specific period.⁵⁸ This feature of CCA can work to influence the public to move towards low-carbon sources of energy whilst jettisoning those sources of energy that are injurious to the atmosphere such as fossil fuels.

There is also the Climate Change Fund which was established under section 15 (1) of the CCA. The fund is to be applied towards *inter alia* the promotion of climate policy and public information dissemination.⁵⁹ To underscore the significance of public education, engagement and awareness in the clean energy drive, the CCA tasked the Secretariat of the Council with the duty of advising the relevant authorities in Nigeria on incorporating climate change topics into all subjects and educational levels nationwide.⁶⁰ Section 25(1) of the CCA also mandated the Secretariat to liaise with relevant stakeholders in driving climate advocacy. The Secretariat is also obligated to create and share a public engagement strategy with the overall objective being to enlighten the public on the National Climate Change Action Plan.⁶¹ This is one area in which the energy transition programme is grossly deficient as identified in part D of our study.

⁵⁶ Climate Change Act, 2021, s. 4.

⁵⁷ *ibid*, s 1(f).

⁵⁸ *ibid*, s.35.

⁵⁹ *ibid*, s.5 2(e).

⁶⁰ *ibid*, s.26(1).

⁶¹ *ibid*, s.30.

4. CHALLENGES

Public acceptance and engagement

Public support is critical to accelerating the energy shift to a carbon-free system.⁶² Public involvement also improves the appeal of carbon-free sources of energy, which is beneficial towards converting to cleaner energy sources.⁶³ A shift in public perception is required for approval, encouraging participation in a diversified system of energy.⁶⁴ Also, challenges relating to solar and wind energy are examples of setbacks a society might encounter⁶⁵ if energy strategies do not begin with increased public involvement and participation.⁶⁶ Public networking, on the other hand, will encourage contact and collaboration between sectors across many organisations, hence boosting decision-making and public participation.⁶⁷

Significant public support is required in the energy transition, which begins with approval from the public. However, broad support is more than just endorsement or rejection. Plus, we can infer that renewable energy policies may be influenced by public support and acceptance of renewable energy which will in turn promote renewable energy deployment.⁶⁸

⁶² D Rosenbloom, J Meadowcroft, S Sheppard, S Burch and S Williams, 'Transition experiments: opening up low-carbon transition pathways for Canada through innovation and learning' (2018) 44 *Canadian Public Policy* 368-383.

⁶³ P Späth and H Rohracher, 'Local demonstrations for global transitions—dynamics across governance levels fostering socio-technical regime change towards sustainability' (2012) 20 *European Planning Studies* 461-479.

⁶⁴ N Eyre, SJ Darby, P Grünewald, E Mckenna and R Ford, 'Reaching a 1.5 C target: socio-technical challenges for a rapid transition to low-carbon electricity systems' (2018) 376, *Article* 20160462.

⁶⁵ T Haukkala, 'Does the sun shine in the High North? Vested interests as a barrier to solar energy deployment in Finland' (2015) 6 *Energy Research and Social Science* 50-58.

⁶⁶ E Heaslip and F Fahy, 'Developing transdisciplinary approaches to community energy transitions: an island case study' (2018) 45 *Energy Research and Social Science* 153-163.

⁶⁷ EH Klijn and J Koppenjan, 'Governance Networks in the Public Sector' (2015) Routledge

⁶⁸ SY Kim, K Ganesan, P Dickens and S Panda, 'Public sentiment toward solar energy—opinion mining of twitter using a transformer-based language model' (2021) 12 *Sustainability* 2673.

Lack of public education and awareness

Low-level awareness and a deficiency in efforts to sensitise the public are challenges in the clean energy transition programme.⁶⁹ Hence, teaching and raising awareness modify behaviours in creating a carbon-neutral system.⁷⁰ Public awareness gotten by public education about the benefits of the energy transition is crucial in fostering involvement in the energy transition. Public awareness events can contribute to sharing useful information and understanding about the clean energy transition.⁷¹ Caitlin Shem *et al* were able to illustrate how public education and knowledge-sharing activities were important contributors to the clean energy transition efforts.⁷²

Behaviour changes and resistance

Although the shift to low-carbon technologies comes with many benefits, it can also be a disadvantage to wealthy consumers who cross-subsidize power services for people with low income.⁷³ **A significant change in consumer behaviour on energy usage is required to successfully meet the net-zero emission targets.**⁷⁴ Decades of policy development are required to implement the major changes brought about by the low-carbon energy transition because social structures are slowly rebuilt with minimal carbon emissions.⁷⁵ In addition, appropriate policies, Technological innovations, financial, and a structural shift in fundamental behaviours, policies and procedures ought to be encouraged in

⁶⁹ MY Suberu, MW Mustafa, N Bashir, NA Muhamad and AS Mokhtar, 'Power sector renewable energy integration for expanding access to electricity in sub-Saharan Africa' (2013) 25 Renewable Sustainable Energy Reviews 630-642.

⁷⁰ KA Munir, 'Being different: how normative and cognitive aspects of institutional environments influence technology transfer' (2002) 55 Human Relations 1403-1428.

⁷¹ J.Axsen and KS Kurani, 'Social influence, consumer behavior, and low-carbon energy transitions' (2012) 37 Annual Review of Environment and Resources 332.

⁷² C Shem, Y Simsek, UF Hutfilter and T Urme, 'Potentials and opportunities for low carbon energy transition in Vietnam: a policy analysis' (2019) 134 Energy Policy 9.

⁷³ L Baker and J Phillips, 'Tensions in the transition: the politics of electricity distribution in South Africa' (2019) 37 Environment and Planning C: Politics and Space 1, 3.

⁷⁴ Mahyar Kamali Saraji and Dalia Streimikiene, 'Challenges to the low carbon energy transition: A systematic literature review and research agenda# (2023) 49 Energy Strategy Reviews 11

⁷⁵ J Meadowcroft, 'Let's get this transition moving' (2016) 42 Canadian Public Policy s10-s17

transitioning into low-carbon energy.⁷⁶ For instance, a change in consumer tastes and technological advancements would be necessary to make the switch from fuel-efficient to electrically driven automobiles.⁷⁷ Still, fossil fuels are essential to human survival and economic growth. The argument between those who believe that human behaviour must change immediately and others who want to maintain and improve the current socioeconomic structure frequently fails to recognise this difference.⁷⁸

Just Transition

Several job opportunities in green industries are going to be created from transitioning to low-carbon energy. However, this can cause losses to employees working in industries heavily reliant on fossil fuels, for instance, the petroleum industry.⁷⁹ The overall impact would be a combination of employment creation in environmentally friendly industries and job loss in neutral sectors, as well as job loss in non-green fields assuming that all new green employment opportunities were filled solely by employees leaving moderate industries.⁸⁰ Additionally, there are limitations on flexible labour markets since certain labour laws prevent workers from switching beyond the current energy landscape to a sustainable one for a variety of reasons, including population trends and a lack of expertise or incompatibilities.⁸¹

⁷⁶ F Urban and J Nordensvärd, 'Low carbon energy transitions in the Nordic countries: evidence from the environmental Kuznets curve' (2018) 11 *Energy* 2209

⁷⁷ D Tyfield, 'Transportation and Low Carbon Development. Low Carbon Development' (2013) Routledge.

⁷⁸ S Pye, P.-H. Li, I Keppo and B O'Gallachoir, 'Technology interdependency in the United Kingdom's low carbon energy transition' (2019) 24 *Energy Strategy Review* 314-330.

⁷⁹ Navraj Singh Ghaleigh, 'Just Transitions for Workers: When Climate Change Met Labour Justice' University of Edinburgh School of Law Research Paper Series No 2019/30, 4 <<https://dx.doi.org/10.2139/ssrn.3456148>> accessed 16 May 2025

⁸⁰ J Baran, A Szpor and J Witajewski-Baltvilks, 'Low-carbon transition in a coal-producing country: a labour market perspective' (2020) 147 *Energy Policy Article* 111878.

⁸¹ WM Chen and H Kim, 'Circular Economy and Energy Transition: A Nexus Focusing on the Non-energy Use of Fuels' (2019) 30 *Energy and Environment* 586-600.

Incentives and investment risk

The available funds needed for energy transitions in developing societies may pose a difficulty in the transition into clean energy.⁸² This leads to an increase in the financial gap needed to mitigate climate change and the requirement for adaptation.⁸³ In addition, off-grid green power can boost development chances and provide rural populations with more affordable energy supplies,⁸⁴ but the necessary investment is very costly.⁸⁵ Also, in market-driven economies, greater monetary incentives are required to encourage the power sector.⁸⁶ To overcome policy opposition and demonstrate a strong commitment to decarbonisation, the government should also provide sufficient incentives for environmentally friendly technologies.⁸⁷

Without private funding and global collaboration, there are still many obstacles to the development of clean energy.⁸⁸ Even so, there are insufficient incentives for individuals or non-profit investors to engage in

⁸² D Mikulić and D Keček, 'Investments in Croatian RES plants and energy efficient building retrofits: substitutes or complements?' (2021) 15 *Energies* 2.

⁸³ C.P.-S. DE Brauwer and J Cohen, 'Analysing the potential of citizen-financed community renewable energy to drive Europe's low-carbon energy transition' (2020) 133 *Renewable Sustainable Energy Review* Article 110300.

⁸⁴ MK. Saraji, E Aliasgari and D Streimikiene, 'Assessment of the challenges to renewable energy technologies adoption in rural areas: a Fermatean CRITIC-VIKOR approach' (2023) 189 *Technical Forecasting and Social Change*, Article 122399.

⁸⁵ NS Ouedraogo, 'Transition pathways for North Africa to meet its (intended) nationally determined contributions ((I) NDCs) under the Paris agreement: a model-based assessment' (2020) 20 *Climate Policy* 71-94.

⁸⁶ S Hall, TJ Foxon and R Bolton 'Financing the civic energy sector: how financial institutions affect ownership models in Germany and the United Kingdom' (2016) 12 *Energy Research and Social Science* 5-15.

⁸⁷ KS Rogge and E Dütschke, 'What makes them believe in the low-carbon energy transition? Exploring corporate perceptions of the credibility of climate policy mixes' (2018) 87 *Environmental Science Policy* 74-88.

⁸⁸ K Vaillancourt, O Bahn and A Levasseur, 'The role of bioenergy in low-carbon energy transition scenarios: a case study for Quebec (Canada)' (2019) 102 *Renewable Sustainable Energy Reviews* 24-34.

green energy initiatives, and there is occasionally substantial opposition to their participation.⁸⁹

Mitigation and adaptation costs

This is a reference to the costs of policies associated with achieving climate goals. Therefore, defining a feasible shift to clean energy is essential for addressing the grave consequences of global warming.⁹⁰ Plus, nations' ability to lead measures to mitigate and adapt to climate change has been negatively impacted by financial limitations and asset privatisation.⁹¹ The cost of reduction as well as the improvement of performance in technologies and how to implement them dynamically is not straightforward and is largely mentioned in the areas of socio-technical transformation and breakthroughs in technology.⁹² Though the price of modern biofuels may end up in significant reduction expenses to the world, the need for new generation biofuels to slow down climate change is rapidly becoming more pressing.⁹³

A carbon-free future will come with high energy structure transition costs given the complexity of energy structures, which are defined by novel technologies, transporters, spatial-temporal factors, as well as, specific considerable infrastructure investments.⁹⁴ Given the substantial expansion of renewable energy, infrastructure investment is therefore

⁸⁹ J Curtin, C Mcinerney and L Johannsdottir, 'How can financial incentives promote local ownership of onshore wind and solar projects? Case study evidence from Germany, Denmark, the UK and Ontario' (2018) 33 *Local Economy* 40-62.

⁹⁰ D Streimikiene, A Mikalauskiene, M Kamali Saraji and A Mardani, 'Framework for assessment of climate change mitigation policies impact on just transition towards low carbon future' (2022) *Handbook of Climate Change Mitigation and Adaptation*, Springer 3115-3148.

⁹¹ P Huang, P Li, 'Politics of urban energy transitions: new energy vehicle (NEV) development in Shenzhen, China' (2020) 29 *Environmental Politics* 524-545.

⁹² S Pye, PH. Li, I Keppo and B O'Gallachoir, 'Technology interdependency in the United Kingdom's low carbon energy transition' (2019) 24 *Energy Strategy Reviews* 314-330.

⁹³ K Vaillancourt, O Bahn and A Levasseur, 'The role of bioenergy in low-carbon energy transition scenarios: a case study for Quebec (Canada)' (2019) 102 *Renewable Sustainable Energy Reviews* 24-34.

⁹⁴ T Li, P Liu and Z Li, 'Quantitative relationship between low-carbon pathways and system transition costs based on a multi-period and multi-regional energy infrastructure planning approach: a case study of China' (2020) 134 *Renewable Sustainable Energy Reviews* Article 110159.

essential. Thus, because there is no single way towards a zero-carbon energy transition, lowering expenses is desirable yet challenging. Despite having the same objective, each method has extensive transition regulations linked to varying time and pace, which would impact transition costs.⁹⁵

Land acquisition

Transitioning to renewable energy requires the acquisition of a massive land expanse. Ultra-mega solar green spaces, for example, need many acres.⁹⁶ Despite these significant financial commitments, there is still a shortage of suitable land for use because it needs to be available, have enough space, and be situated in regions with high energy demands. Lands exclusively under government control can satisfy these criteria. The worldwide land rush towards a low-carbon transition depends heavily on land grabs.⁹⁷ The act of enclosing vast tracts of land is known as land grabbing.⁹⁸ Furthermore, another type of land grab that deprives people of their natural assets and land under equitable use is known as green grabbing.⁹⁹ For instance, the construction of the photovoltaic (PV) plant has changed land-use patterns and sparked new land-use issues. In addition to receiving payment for the rising costs on nearby properties, landowners may argue that the plant's discomfort violates their entitlement to landscapes and thereafter attempt to have their land classed as a plant's land.¹⁰⁰

Further, it may be necessary to limit land use to preserve high-biodiversity areas or locations at risk of depleting carbon reserves; as a result,

⁹⁵ A Nikas, V Stavrakas, A Arsenopoulos, H Doukas, M Antosiewicz, J Witajewski-Baltvilks and A Flamos, 'Barriers to and consequences of a solar-based energy transition in Greece' (2018) 35 *Environmental Innovation and Societal Transitions* 383-399.

⁹⁶ K Johansen, 'Blowing in the wind: a brief history of wind energy and wind power technologies in Denmark' (2021) 152 *Energy Politics*, Article 112139.

⁹⁷ E Rignall, 'Solar power, state power, and the politics of energy transition in pre-Saharan Morocco' (2016) 48 *Environment Planning A: Economy and Space* 540-557.

⁹⁸ SM Borrás JR. and JC Franco, 'Global land grabbing and political reactions from below' (2013) 34 *Third World Quarterly* 1723-1747.

⁹⁹ J Fairhead, M Leach and I Scoones, 'Green grabbing: a new appropriation of nature?' (2012) 39 *Journal of Peasant Studies* 237-261.

¹⁰⁰ L Silva and S Sareen, 'Solar photovoltaic energy infrastructures, land use and sociocultural context in Portugal' (2021) 26 *Local Environment* 337-363.

landowners who had to give up revenue potential may occasionally receive financial compensation.

Anti-innovation policies

To restructure the present state of energy sectors to enhance the shift to renewables, there is a need for the implementation of innovative policies.¹⁰¹ However, it is important to consider carbon pricing in the context of climate mitigation since creative policies, including subsidies, rules, and information sharing, are also required to foster development and eliminate barriers to sustainable pathways.¹⁰² Additionally, regulations and initiatives are in place to support clean energy technology and ease the shift to a sustainable economy.¹⁰³ To put it another way, government initiatives should be maintained over time, and all policies should be integrated to achieve the goals of the green energy change.

Conflicts and reformations

Transition governance is one which is diverse and one which permits planned shifts toward sustainability in social and technical structures.¹⁰⁴ Hence, step-by-step reformation is necessary, especially in countries with strict governance, which may have conflict-causing policies that will hinder switching to utilities with lower carbon emissions.¹⁰⁵ Throughout the many phases of policy formulation, ongoing disagreements may be seen, which could have an immediate impact on investments. The state, which is commonly referred to as the executive, legislative, and judicial

¹⁰¹ H Haarstad, 'Where are urban energy transitions governed? Conceptualizing the complex governance arrangements for low-carbon mobility in Europe' (2016) 54 *Cities* 4-10.

¹⁰² D Rosenbloom, J Meadowcroft, S Sheppard, S Burch and S Williams, 'Transition experiments: opening up low-carbon transition pathways for Canada through innovation and learning' (2018) 44 *Canadian Publication Policies* 368-383

¹⁰³ C Shem, Y Simsek, UF Hutfilter and T Urmee, 'Potentials and opportunities for low carbon energy transition in Vietnam: a policy analysis' (2019) 134 *Energy Policies*, Article 110818

¹⁰⁴ J Markard and D Rosenbloom, 'Political conflict and climate policy: the European emissions trading system as a Trojan Horse for the low-carbon transition?' (2020) 20 *Climate Politics* 1092-1111

¹⁰⁵ P Huang and P Li, 'Politics of urban energy transitions: new energy vehicle (NEV) development in Shenzhen, China' (2020) 29 *Environmental Politics* 524-545

authority in its type of government, is crucial to transitional governance.¹⁰⁶ During the shift in the governance process, the state's responsibilities include organizing, supplying, regulating, introducing, supervising, and protecting.

5. CONCLUSION AND RECOMMENDATIONS

This article commenced with a general overview of the effects of global warming, the COVID-19 pandemic and the ongoing clean energy transition trend. The article reviewed various scholarly works and highlighted gaps which served as motivation for inquiry into Nigeria's current position and potential in achieving its energy transition in the post-pandemic era. The article reviewed various international and national legal instruments that serve as the legal basis for the push for transitioning to low-carbon sources of energy in Nigeria. The article found that there are existing laws with ample statutory provisions that can facilitate the realisation of Nigeria's clean energy drive. The article however found that there were some gaps in the laws and challenges which needed redress if Nigeria was to make significant progress in its push towards achieving net-zero emissions by 2050. Flowing from these findings, the following recommendations are provided below:

- Nigeria should take a cue from the precedent set by countries in the Global North and study their laws and technological process to implement a transfer of clean energy technologies albeit with the necessary modifications to enable it to conform to local circumstances.
- Nigeria should undertake a comprehensive review of its laws and policies to identify bottlenecks that hinder critical factors like infrastructural investments, incentives for the production and distribution of clean energy technologies, labour issues, etcetera.
- Further research is required on matters like the regulatory framework, training, market dynamics, and innovation. Partnerships should be forged with important local and foreign

¹⁰⁶ MJ Ivanov, 'Governed by tensions: the introduction of renewable energies and their integration in the Bulgarian energy system (2006–2016)' (2019) 32 *Environmental Innovation and Societal Transitions* 90-106

players to fully optimise the production and utilisation of clean energy technologies in industries and sectors including energy, transport, construction, agriculture, etcetera.

- Government should take an active role in attracting and encouraging investments in this area. The government can do this through bodies like the Nigeria Sovereign Investment Authority ('the Authority'). According to Section 3(b) Nigeria Sovereign Investment Authority, (Establishment, etc.) Act, 2011, enhancing the development of Nigerian infrastructure is a statutory object of the Authority. The Government can also use the instrumentality of the law to raise funds for the capital-intensive activities of renewable energy technologies or grant tax waivers and rebates where necessary as a way of giving incentives. Statutes like the Venture Capital (Incentives) Act, the Nigeria Export Processing Zones Act and tax-related laws can be utilized in this regard.
- Lastly, public awareness is an issue in society that increases public involvement and decreases the opposition to change. For this cause, policies that promote an environmentally conscious society should be carried out, especially in transport, which is regarded as an outlet for greenhouse gas emissions.