The Role of Legislation in Ensuring Sustainable Energy Development in Nigeria: Lessons from Kenya

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ABSTRACT

Electricity is the most widely used form of energy. Access to electricity is generally recognised as key to achieving sustainable human and economic development. Nigeria has a perennial problem of inadequate electricity supply that now threatens the country's energy security. A reliance on fossil fuel, the main source of grid electricity in Nigeria, has not led to sufficient electricity generation that can meet the demand for electricity, and its future capacity to do so is doubtful.

Nigeria's energy policy supports the diversification of electricity generation to exploit Nigeria's abundant renewable energy resources and increase the share of electricity generated from renewables. However, this policy has not translated to additional electricity generation. This is because legislation in Nigeria does not contain provisions to drive the development of renewable energy resources that is required for sustainable electricity generation. In view of the country's population growth rate, which in turn means more energy demand, Nigeria needs to carefully and vigorously pursue its renewable electricity objectives through a law or laws dedicated to encouraging the generation of electricity from renewables.

This thesis examines the role legislation can play in the realisation of sustainable energy objectives in Nigeria. It will do this by undertaking a comparative study of law and electricity generation in Nigeria and Kenya, the latter of which has been held up as a model for renewable energy development by organisations such as the World Bank. This thesis will derive lessons from the development of renewable electricity in Kenya that may assist Nigeria in the achievement of its aspirations to provide electricity on a sustainable basis.

ORIGINALITY STATEMENT

I certify that this work contains no material which has been accepted for the award of any other degree or diploma in my name in any university or other tertiary institution and, to the best of my knowledge and belief, contains no material previously published or written by another person, except where due reference has been made in the text. In addition, I certify that no part of this work will, in the future, be used in a submission in my name for any other degree or diploma in any university or other tertiary institution without the prior approval of the University of Adelaide and where applicable, any partner institution responsible for the joint award of this degree.

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Kamoru Lawal

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LIST OF ABBREVIATIONS

AFUR	African Forum for Utility Regulators
CEF	Consolidated Energy Fund
DisCos	Distribution companies
EAP&L	East African Power and Lighting Company
ECN	Energy Commission of Nigeria
ECN Act	Energy Commission of Nigeria Act
EPA	Electric Power Act
EPIC	Electric Power Sector Implementation Committee
EPRA	Energy and Petroleum Regulatory Authority
EPSR Act	Electric Power Sector Reform Act
EPT	Energy and Petroleum Tribunal
ERB	Electricity Regulatory Board
ERC	Energy Regulatory Commission
FiT	Feed-in tariff
FMP	Federal Ministry of Power
FMPS	Federal Ministry of Power and Steel
FMPWH	Federal Ministry of Power, Works and Housing
GDC	Geothermal Development Company
GenCos	Generating companies
GWh	Gigawatt hours
GoK	Government of Kenya
GoN	Government of Nigeria
IEA	International Energy Agency
IPCC	Intergovernmental Panel on Climate Change

IPP	Independent power producer
KenGen	Kenya Generating Company Limited
KETRACO	Kenya Transmission Company Limited
KPC	Kenya Power Company
KPLC	Kenya Power and Lighting Company Limited
KREP	Rural Electrification Programme, Kenya
KWh	Kilowatt-hour
LCPDP	Least Cost Power Development Plan
Mtoe	Million tonnes of oil equivalent
MW	Megawatts
NACOP	National Council on Power
NBET	Nigerian Bulk Electricity Trading
NDA	Niger Dams Authority
NEP	National Energy Policy
NEPA	National Electric Power Authority
NEPP	National Energy and Petroleum Policy
NERC	Nigerian Electricity Regulatory Commission
NESCO	Nigerian Electricity Supply Company
NREEEP	National Renewable Energy and Energy Efficiency Policy
NREP	Nigerian Rural Electrification Programme
NPC	National Planning Commission
PCAF	Power Consumer Assistance Fund
PHCN	Power Holding Company of Nigeria
PPA	Power purchase agreement
PV	Photovoltaic
PWD	Public Works Department

RE	Renewable energy
REA	Rural Electrification Authority
REAP	Renewable Electricity Action Program
REF	Rural Electrification Fund
REPF	Rural Electrification Programme Fund
REFiT	Renewable Energy Feed-in Tariff
REMP	Renewable Energy Master Plan
REP	Rural Electrification Programme
REPF	Rural Electrification Programme Fund
REPG	Renewable Electricity Policy Guidelines
RERAC	Renewable Energy Resources Advisory Committee
REREC	Rural Electrification and Renewable Energy Corporation
SD	Sustainable development
SE	Sustainable energy
SE4ALL-AA	Sustainable Energy for All Action Agenda
SG	State government
VAT	Value added tax

CHAPTER 1

GENERAL INTRODUCTION

1.1. Background

Energy is a key component of 21st century life and a driver of sustainable development (SD). It has been argued that no nation can tackle the challenges of economic development and reduce poverty in the absence of massive deployment of energy.[1] Energy 'is an entry point to achieving broader society objectives'.[2] Moreover, population growth is inextricably connected to energy consumption: the more populated a country is, the greater its energy requirements.[3] Thus, countries with high populations and population growth need to be prepared for more energy use.[4] In developing countries, increasing the use of renewable energy (RE) in electricity generation is now generally seen as fundamental to energy security including access to clean energy by current and future populations, while also achieving development that is environmentally sustainable.

Nigeria views the sustainable use of energy resources as critical to the realisation of its development goals.[5] Since its discovery in commercial quantities in 1956, crude oil has been the mainstay of Nigeria's economy as well as a major source of foreign earnings. Coal, which was the main energy source up to the early 1960s, especially in the commercial, rail and electricity generation sectors, ceased to be so with the discovery of crude oil.[6] Currently, petroleum, natural gas, biomass (predominantly fuel-wood) and hydropower are Nigeria's main

[1] Yinka Omorogbe, 'The Role of Law in Promoting Renewable Energies in Africa' in O C Ruppel and B

[2] Thomas B Johansson, 'The Imperative of Energy for Sustainable Development' in Adrian J Bradbrook et al (eds), *The Law of Energy for Sustainable Development* (Cambridge University Press, 2005) 46, 46.

[3] B M Francis, L Moseley and S O Iyare, 'Energy Consumption and Projected Growth in Selected Caribbean Countries' (2010) 29(6) *Energy Economics* 1224.

[4] Kamil Kaygusuz, 'Energy for Sustainable Development: A Case of Developing Countries' (2012) 16 *Renewable and Sustainable Energy Reviews* 1116, 1116.

[5] Energy Commission of Nigeria (ECN), *National Energy Masterplan* (Draft Revised Edition, 2014) 1.

[6] D A Idiege, 'Politics of Energy Exploitation and Environmental Degradation in the Niger-Delta Region of Nigeria' (2017) 5(2) *Journal of Pollution Effects & Control* 1, 1; E K Dike, S N Udeh and I O Onwuka, 'Resolving Nigeria's Dependency on Oil – The Derivation Model' (2015) 7(1) *Journal of African Studies and Development* 1, 2.

sources of primary energy, while electricity (mainly grid) remains a source of commercial energy.[7] Since the 1960s, an increase in the population, acceleration in the rates of urbanisation, and the growth of the transport sector have led to a vast increase in the demand for energy, including electricity.

Nearly all sectors of the Nigerian economy make use of electricity, though for different purposes.[8] Nigeria requires around 180,000 MW of electricity to provide stable electricity supply for sustainable economic developments.[9] However, Nigeria cannot currently deliver the volume of electricity required to power the economy. Although more thermal plants were built between 1960 and 1979 to boost the electricity generation capacity of the country, there was no real attempt to increase the country's electricity capacity until 1999, when a democratically elected government was installed in Nigeria.[10] Between 1960 (when Nigeria gained independence) and 1999 (when Nigeria returned to a democratic government,) there were military interventions in the Nigerian politics which spanned more than 29 years.[11] The prolonged military rule affected the socio-political situation of the country which in turn contributed to the poor funding of the electricity infrastructure.[12] More recently, Nigeria has had to reposition its electricity sector with a vision to deliver stable, sustainable and uninterrupted electricity supply for SD. Within the framework of this vision, Nigeria has set

[7] ECN, *National Energy Masterplan* (n 5) 99; M F Akorede, O Ibrahim, S A Amuda, O A Otuoze and B J Olufeagba, 'Current Status and Outlook of Renewable Energy Development in Nigeria' (2017) 36(1) *Nigerian Journal of Technology* 196, 198.

[8] Energy Commission of Nigeria (ECN), *National Energy Policy* (2003) 35–6.

[9] Energy Mix Report, Nigeria require 180,000mw of electricity- United Capital Exec' Energy Mix Report (Online) 24 September, 2017 <https://www.energymixreport.com/nigerians-require-180000mw-electricity-united-capital-exec/>; Samuel Awoyinfa, ''Nigeria needs 180,000MW to enjoy stable power supply' 21 June, 2018 <https://punchng.com/nigeria-needs-180000mw-to-enjoy-stable-power-supply/>.

[10] Ayodele Oni, *The Nigerian Electric Power Sector: Policy, Law, Negotiation Strategy, Business* (Authorhouse, 2013) 33; C C Uzoma, C E Nnaji and M Nnaji, 'The Role of Energy Mix in Sustainable Development of Nigeria' (2012) 5(1) *Continental Journal of Social Sciences* 5(1) 21.

[11] Nigeria only had two civilian regimes during the period. First was between October 1, 1960 and January 15, 1966. The second civilian regime was between October 1, 1979 and December 31, 1983. See, Chidi A. Odinkalu, 'The Management of Transition to Civil Rule in Nigeria (1966-1996)' in 'Kunle Amuwo, Daniel C. Bach and Yaun Lebeau (eds), *Nigeria during the Abacha Year (1993-1998)* (IFRA-Nigeria, 2001) 57, 57.

[12] Oluwaseun Peter and Oluwaseun O Samue, 'Military Regimes and Nigeria's Economic Development, 1966-1999' (2018) 9(4) Arts and Social Science Journal 1; Olufolahan Osunmuyiwa and Agni Kalfagianni, 'The Oil Climax: Can Nigeria's fuel subsidy reforms propel energy transitions?' (2017) 27 *Energy Research & Social Science* 96.

electricity objectives, of which key objectives are sustaining the security of the electricity supply, ensuring reliability of supply, and ensuring unhindered access to electricity.[13]

As laudable as the electricity objectives and the vision are, electricity generation in Nigeria is far from advancing SD objectives. The installed capacity is barely 12,000 MW, with a monthly average of 4,000 MW for a population of over 193 million people.[14] The average monthly electricity production is not a good reflection of Nigeria's position as the 'giant of Africa', the largest economy in Africa. Compared with other African countries, Nigeria has one of the lowest per capita electricity consumption. Electricity production and consumption in Nigeria is far from being sustainable.

Prior to independence in 1960, and for many years after independence, coal and hydro were the principal sources of electricity generation in Nigeria. Nigeria later embraced gas as the main electricity generation source followed by hydro, with an insignificant contribution from other sources.[15] Apart from its negative environmental impact and, in Nigeria, fluctuations in supply, gas is not sustainable because its supply can be depleted. Achieving an electricity generation sector that offers reliable, secure, diversified and environmentally-sustainable electricity is a major challenge for Nigeria. A critical aspect of this challenge is how to deliver electricity to a greater number of people who currently do not have access to clean electricity, in fulfilment of SD goals given that there is a huge gap in electricity access between urban and rural areas. As will be shown later in this thesis, the legal and regulatory setting that has existed since the 1960s is the major cause of disparity in access to electricity between urban and rural areas in Nigeria.

[13] ECN, *National Energy Masterplan* (n 5) 90–1.

[14] Kayode Olaniyan, Benjamin C McLellan, Seiichi Ogata and Tetsuo Tezuka, 'Estimating Residential Electricity Consumption in Nigeria to Support Energy Transitions' (2018) 10 *Sustainability* 1, 3, 7.

[15] Ismaila H Zarma, *Hydro Power Resources in Nigeria, Energy Commission of Nigeria* (Country position paper presented at 2nd Hydro Power for Today Conference, International Centre on Small Hydro Power, Hangzhou, China 2006).

The quest to address electricity generation challenges has necessitated the introduction of government policies designed to increase the uptake of RE in electricity generation in Nigeria, to enhance the security of the electricity system, improve electricity access, and reduce the country's reliance on fossil fuels, which is also a source of environmental concern globally.[16] Since the introduction of the National Energy Policy (NEP) in 2003, successive governments in Nigeria have attempted to establish long-term objectives for the exploitation and use of RE resources, in order to achieve a more diversified electricity mix for SD.[17] Numerous other policy documents now specifically target the development of RE in general and for electricity generation. These include the Renewable Energy Master Plan,[18] the Renewable Energy Policy Guidelines (REPG), [19] the National Renewable Energy and Energy Efficiency Policy (NREEEP),[20] and the Sustainable Energy for All Action Agenda (SE4ALL-AA).[21] All of these documents target electricity generation from RE source and set targets for the percentage of RE-sourced electricity to be included in the nation's electricity mix. Apart from these documents, the actualisation of renewable electricity objectives is also the focus of economic policies in Nigeria. One such economic document is the report of the National Technical Working Group on Energy Sector (popularly referred to as the Vision 20:20 Program), which was inaugurated in 2009 to re-appraise the country's economic development plans vis-à-vis electricity generation.[22] In addition, the Government of Nigeria (GoN) has embarked on a number of programs directed at improving electricity generation and access. One of these is the rural electrification programme (REP). Through the REP, the GoN plans to bring electricity access to a greater number of people in rural areas, with a certain percentage of the proposed

[16] National Council on Power (NACOP), *Sustainable Energy for All Action Agenda (SE4ALL-AA)* (2016) 12.
[17] ECN, *National Energy Policy* (n 8).
[18] Energy Commission of Nigeria (ECN), *Renewable Energy Master Plan* (Draft Revised Edition, 2012).
[19] Federal Ministry of Power and Steel (FMPS), *Renewable Energy Policy Guidelines* (Federal Republic of Nigeria, 2006).
[20] Federal Ministry of Power (FMP), *National Renewable Energy and Energy Efficiency Policy* (Federal Republic of Nigeria, 2015).
[21] NACOP, *Sustainable Energy for All Action Agenda* (n 16).
[22] National Planning Commission (NPC), *Report of the Vision 2020 National Technical Working Group on Energy Sector* (Presidency, 2009) 13, 179. The Vision 20:20 Program and its connection with electricity generation will be discussed later in this thesis.

megawatts to be sourced from RE.[23] However, as will be demonstrated later in this thesis, these programs have, as yet, been of only limited success.

The inclusion of electricity from RE sources is a transition that requires legislation to overcome the various barriers to the uptake of RE. Electricity law in Nigeria – namely, the *Electric Power Sector Reform Act* (EPSR Act) – is the main driver of Nigeria's renewable electricity objectives.[24] Complementing the *EPSR Act* on the development of RE is the *Energy Commission of Nigeria Act* (ECN Act). Whilst the *EPSR Act* deals with electricity regulation generally, the *ECN Act* regulates research on the use and exploitation of alternative energy sources in Nigeria.

Despite the policy direction on the use and exploitation of RE for sustainable electricity, the national policies are yet to translate to increased megawatts of electricity.[25] As will be shown in Chapter 3, the *EPSR Act* and the *ECN Act* as they currently stand are insufficient to achieve Nigeria's sustainable/renewable electricity objectives. There is a disconnect between Nigeria's renewable electricity policy objectives and the ability of legislation, including electricity legislation, to achieve these objectives. This thesis contends that Nigeria has failed to increase the uptake of RE in electricity generation because it has failed to enact a RE law to drive renewable electricity objectives in accordance with the country's energy policy. Leading Nigeria energy scholar Omorogbe posits that the bane of RE in many African countries is the absence of law to drive energy policies.[26] The learned scholar further states that the failure of any government to put in place the appropriate legal structure will not only 'lead to a distorted

[23] Federal Government of Nigeria (FGN), *Power Sector Recovery Implementation Program* (Office of the Vice-President of the Federation, 2017).

[24] Osaretin Aigbovo and Ebiton Ogboka, 'Electric Power Sector Reform Act 2005 and the Development of Renewable Energy in Nigeria' (2016) 7 *Renewable Energy Law and Policy Review* 20, 26.

[25] Chukwuka G Monyei, Aderemi O Adewumi, Michael O Obolo and Barka Sajou, 'Nigeria's Energy Poverty: Insights and Implications for Smart Policies and Framework Towards a Smart Nigeria Electricity Network' (2018) 81 *Renewable and Sustainable Energy Review* 1582, 1586.

[26] Yinka Omorogbe, 'Promoting Sustainable Development through the Use of Renewable Energy: The Role of the Law' in Donald N Zillman (ed), *Beyond Carbon Economy: Energy Law in Transition* (Oxford University Press, 2008) 45.

legal environment'[27] but also a policy failure. It is law that drives the fulfilment of energy policy: without law, energy policy is ineffective.

To achieve energy sustainability, Nigeria needs a paradigm shift with respect to legislating for use of RE for electricity generation. The country cannot achieve its renewable electricity targets and address the challenges of electricity access in the absence of specific RE legislation. It is important that Nigeria identifies the gaps in the current legislative regime and enacts a law specifically directed to the development of RE resources for electricity. Doing this will put Nigeria on par with other African countries that have overcome similar electricity challenges, and set Nigeria on the path of sustainable energy (SE) production. In developing and implementing the proposed RE law, a comparative analysis with another country that has more experience in the development of RE will provide useful lessons for Nigeria. This thesis will undertake a comparative study with Kenya, which has 'one of the most developed power sectors in the sub-Sahara Africa',[28] and is one of the few African countries that have achieved a substantial inclusion of electricity from RE sources in their energy mix.[29] Part V and IV of Kenya's *Energy Act 2006* and *Energy Act 2019* ('the New Energy Act') respectively are dedicated to RE and energy efficiency. In addition, there are a number of successful policies and programs in Kenya targeting electricity generation and access using RE resources and technologies. Many rural communities in Kenya have access to electricity that would have been of out of their reach courtesy of these programs.[30] Some of these programs in Kenya will be discussed in Chapter 4.

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[27] Omorogbe, 'The Role of Law' (n 1) 219

[28] Power Africa: Kenya: Power Africa Fact Sheet (US Agency for International Development, 2018) <https://www.usaid.gov/powerafrica/kenya>.

[29] Helen Hoka Osiolo, Pueyo Ana and James Gachanja, 'The Political Economy of Investment in Renewable Electricity in Kenya' in Ana Pueyo and Simon Bawakyillenuo (eds), *Green Power for Africa: Overcoming the Main Constraints* (2017) 48(5–6) *IDS Bulletin* 119; Sujeetha Selvakkumaran and Semida Silveira, 'Exploring Synergies between the Intended Nationally Determined Contributions and Electrification Goals of Ethiopia, Kenya and the Democratic Republic of Congo' (2018) 11(5) *Climate and Development* 401.

[30] Ministry of Energy and Petroleum, *Kenya Action Agenda: Sustainable Energy for All* (Republic of Kenya, 2016) 33.

1.2 Role and Aims of this Thesis

In order to make suggestions for legal reform in Nigeria, this thesis will first examine the current legal and regulatory framework for electricity in Nigeria, with a view to identifying barriers to renewable electricity generation. A number of authors have already identified several deficiencies in the law and, legal and regulatory framework in Nigeria, which act as barriers to the development of RE. For example, Onyejelam, writing on the energy crisis in Nigeria, identifies the lack of an effective institutional framework, the lack of public awareness of RE and the non-implementation of RE policies as key challenges confronting the development of RE. In proffering solutions to the challenges, Onyejelam lists guaranteed access to the grid for RE-sourced electricity, tax exemptions for RE, and legislative provisions to ensure a 'level playing field' for RE and fossil fuels as some of the ways in which legislation should be reformed to address these challenges.[31]

Olawuyi examines the challenges of energy security in Nigeria and the possibility of exploring RE sources in electricity generation. He questions the existing structure for RE development in Nigeria.[32] Olawuyi analyses the barriers to the inclusion of RE in the energy mix to include finance, research and development, and legal and institutional barriers. The learned author, after reviewing the structure for the regulation of RE in Nigeria, concludes that Nigeria may not be able to generate electricity from RE sources without addressing the identified barriers.[33] Emodi and Ebele identify finance and investment, the absence of standardised power purchase agreements in the electricity sector, policy instability, and the lack of public awareness of the potential of RE as some of the challenges in Nigeria.[34] Oniemola identifies the absence of clear coordination and clarity of purpose among the key institutions, and connection issues, among

[31] Onyejelam Emem, 'The Energy Crisis in Nigeria and the Role of Law in Promoting Renewable Energy Development', *SSRN* (October 2015) <https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2672625>.

[32] Damilola S Olawuyi, 'Power Generation through Renewable Energy Sources: An Analysis of the Legal Barriers and Potentials in Nigeria' (2013) 10(2) *Journal of Resources, Energy and Development* 105.

[33] Ibid.

[34] N V Emodi and N E Ebele, 'Policies Enhancing Renewable Energy Development and Implications for Nigeria' (2016) 4(1) *Sustainable Energy* 7.

the major barriers to increasing the use of RE in electricity generation in Nigeria. According to Oniemola, the existing legal structures 'do not place renewable energy at a competitive advantage'.[35] The learned author further examines the role of the feed-in tariff policy in Germany, and makes a case for a policy that will take into consideration tariff differentiations, guaranteed access to the grid and guaranteed priority.[36] Oniemola also proposes the enactment of a law to support electricity from RE sources in Nigeria.

In dissecting the challenges of electricity generation in Nigeria, Oni analyses the theoretical basis for electricity reform in Nigeria from a regulatory perspective. He argues that the creation of the Nigerian Electricity Regulatory Commission (NERC) as a sole regulator, the introduction of different electricity tariffs and the new licensing regime in the *EPSR Act* were among the factors that contributed to the introduction of a competitive electricity market in Nigeria. Oni does not, however, consider the exploitation of RE in Nigeria. Rather the focus of Oni's work is on the legal framework for electricity and its consequences for the electricity industry.[37] Amadi examines the history of electricity reform in Nigeria and identifies that the competitive advantage of gas and hydro-based electricity over renewable electricity is the bane of RE development in Nigeria. Amadi proposes legal reform to achieve a complete liberalisation and commercialisation of the electricity industry.[38] He argues that Nigeria needs to undertake electricity reform as part of a comprehensive economic development strategy. Only in this way can electricity generation support SD.

Although previous scholars have already clearly identified a number of challenges facing the development of renewable electricity in Nigeria, none of the works to date have undertaken a

[35] Peter K Oniemola, 'Powering Nigeria through Renewable Electricity Investment: Legal Framework for Progressive Realization' (2015) 6(1) *Afe Babalola University Journal of Sustainable Development, Law and Policy* 83, 85.

[36] Peter K Oniemola, 'Why Should Oil Rich Nigeria Make a Law for the Promotion of Renewable Energy in the Power Sector?' (2016) 60(1) *Journal of African Law* 29, 49.

[37] Oni (n 9).

[38] Sam Amadi, 'Improving Electricity Access through Policy Reform: A Theoretical Statement on Legal Reform in Nigeria's Power Sector' in Yinka Omorogbe and Ordor A Okoye (eds), *Ending Africa's Energy Deficit and the Law: Achieving Sustainable Energy for All in Africa* (Oxford University Press, 2018) 347.

comparative analysis of renewable electricity legislation in Nigeria with that of a country with a similar legal system, and at a similar stage of economic development, in order to derive lessons for the way in which the law and regulatory regime could be amended to overcome the barriers to the development of RE in electricity generation. This thesis seeks to fill this gap in the literature. The primary and fundamental aim of this thesis is to examine the law in Nigeria and Kenya to see what, if any, lessons can be learned in order to propose a RE law, and/or other legal reforms, for Nigeria.

1.3 Methodology

This thesis will adopt analytical and comparative methods, undertaking a critical comparative analysis of law and policy for the regulation of electricity, including renewable electricity, in Nigeria and Kenya. Comparative methodology examines differences and similarities between at least two contexts. Legislators and policy makers have been employing comparative knowledge since ancient times, and this extends to the field of energy law, including electricity law and regulation, and renewable energy law and policy.[39] As stated by Giuseppe and Talus, legal limitations and transplant, which is an outcome of a comparative knowledge, is one of the cheapest ways to innovate a regulatory system of a leading country. This will help in understanding how the processes of legal transfer should be managed.[40]

Kenya has been chosen as a case study for a number of reasons. First, promoting energy sustainability is one of the planks of Kenya's energy law.[41] Kenya's electricity sector has been

[39] Konrad Zweigert and Hein Kötz, *An Introduction to Comparative Law*, 3rd ed. (Trans. Tony Weir) (Oxford University Press, 1998) 34; Ralf Michaels, *The Functional Method of Comparative Law*, Duke Law School Legal Studies Research Paper Series, Research Paper No. 87 November 2005; Jan M Smith, 'Comparative Law and its Influence on National Legal Systems' in Mathias Reimann and Reinhard Zimmermann (eds), *The Oxford Handbook of Comparative Law* (Oxford University Press, 2006) 477; Edward J Eberle, 'The Methodology of Comparative Law' (2011) 16(1) *Roger Williams University Law Review* 51.

[40] Bellantuono Giuseppe and Kim Talus, 'Introduction', in Bellantuono Giuseppe and Kim Talus (eds), *Special Issue on Comparative Energy* (2011) 2 *Law, Oil Gas and Energy Law*.

[41] Republic of Kenya, *Updated Least Cost Power Development Plan Study Period: 2011–2031* (2011) 49; Republic of Kenya, *Kenya Vision 2030* (2007) 49.

identified as a model for other African countries.[42] Apart from the successes it has recorded in the deployment of RE for electricity generation, Kenya is the only African country benchmarked by the World Bank for RE development.[43] Kenya is also one of the leading African countries in electricity generation from geothermal and wind.[44]

Secondly, Kenya provides an example of how renewable-sourced electricity can enhance electricity access specifically in rural areas. Kenya has a growing population that is concentrated mostly in rural areas. The population pattern is a major challenge to the Government of Kenya (GoK) for the simple reason that, whilst the government is obliged to provide electricity to every part of Kenya, a majority of these areas are not connected to the grid.[45] These challenges notwithstanding, Kenya is one of the few African countries that are on the verge of achieving universal access to energy, a key component of SD goals and one of Kenya's Vision 2030 objectives.[46] Increasing electricity access in rural areas is a key issue for Nigeria, and studying Kenya's approach in this regard may provide valuable lessons.

Thirdly, international donors and investors regard Kenya as an investment destination given the country's market-friendly approach to RE development. According to an energy investor:

> Kenya is far ahead from the rest of Africa. They have a great track record. They have invested a lot in capacity building, have good advisors, strong political support, and solid commercial relationships. I have a great opinion of Kenya Power. Their regulatory reform has worked and they are rapidly increasing electrification rates.

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[42] World Bank, *The World Bank Electricity Expansion (P103037), Energy & Extractives Global Practice Africa Region* (Report No ICR00004496, 2018) 73.

[43] Ana Pueyo, 'What Constrains Renewable Energy Investment in Sub-Saharan Africa? A Comparison of Kenya and Ghana' (2018) 109 *World Development* 85, 87; World Bank (n 40) para 73; Deutsche Gesellschaft für International Zusammenarbeit (GIZ) GmbH, *Legal Frameworks for Renewable Energy: Policy Analysis for 15 Developing and Emerging Countries* (2012) 83.

[44] World Bank (n 41) 43; Remco Fischer, Jenny Lopez and Sunyoung Suh, 'Barriers and Drivers to Renewable Energy Investment in Sub-Saharan Africa' (2011) 2(1) *Journal of Environmental Investing* 1, 70.

[45] Government of Kenya, *Kenya Population Situation Analysis, United Nations Population Fund (UNFPA)* (Kenya Country Office, 2013) 8–9; Kenneth Lee et al, 'Electrification for "Under Grid" Households in Rural Kenya' (2016) 1 *Development Engineering* 26, 28.

[46] Kenya Miniwind Project, *Market for the Integration of Smaller Wind Turbines in Mini-grids in Kenya* (Ministry of Foreign Affairs of Denmark through the DANIDA Market Development Partnerships, 2018) 4–5 <https://kenyacic.org/sites/default/files/publications/Kenya-mini-grid-market-study-FINAL.pdf>.

> What reassures investors is to see that their competitors are being paid and are getting their investment back. That is why Kenya will go well.[47]

Fourthly, and crucially, Nigeria and Kenya share common historical antecedents in terms of law, political structures and public institutions. Both are common law countries and former British colonies. Nigeria and Kenya maintain a centralised structure for the regulation of the electricity sector, and are both members of the African Forum for Utility Regulators (AFUR). AFUR focuses on the development of effective regulation in Africa through facilitation and harmonisation of regulatory policies and legislation.[48] The Energy Sectoral Committee of AFUR has, as one of its mandates, the development of RE generation through the formulation of 'home grown guidelines for the introduction of sustainable renewable energy industry in Africa'.[49] Both countries are developing countries, with significant developmental differences between urban areas and the rural poor, including a lack of access to modern energy services in rural areas, and both have abundant (and similar) RE resources.

The similarities between the two countries' legal systems, political structures and public institutions are important as this may facilitate the 'export' of laws from Kenya to Nigeria. Scholars of comparative law have observed that, where there are vast differences in the legal systems, culture, politics and history of two countries, it can be difficult in practice to take laws from one country and successfully adopt them in the other.[50] Notwithstanding the difficulties in exporting laws that have been identified by comparative law scholars, it has also been observed that 'legal transplant' is a reality of globalisation.[51] While it is well beyond the scope of this thesis to engage in a theoretical discussion of comparative law, it is submitted that the similarities between Nigeria and Kenya justify a comparative study between these two countries, and that an analysis of Kenya's legal and regulatory approach to RE may offer useful

[47] Pueyo (n 43) 91.

[48] African Forum for Utility Regulators (AFUR), *About Us* (2019) <http://afurnet.org/about-us/>.

[49] AFUR, *AFUR Energy Sectoral Committee Work Programme for 2017–2018*, 1.

[50] George A Bermann, Patrick Glenn, Kim Lane Scheppele, Amr Shalakany, David V Snyder and Elisabeth Zoller 'Comparative Law: Problems and Prospects' 26(4) *American University International Law Review* 935, 947.

[51] Alan Watson, 'The Birth of Legal Transplant' (2013) 41(3) *Georgia Journal of International and Comparative Law* 605, 607; Pierre Legrand, 'The Impossibility of Legal Transplants' (1997) 4 *Maastricht Journal of European and Comparative Law* 111, 114.

lessons regarding legislative measures to promote renewable electricity and access that can be adopted, or at least considered for adoption, in Nigeria.

1.4 Scope of this Thesis

First, the comparative analysis undertaken in this study does not cover the entire legal systems of Nigeria and Kenya. Rather, it is limited to a critical analysis of the major Acts and policies relevant to the regulation of the electricity industry, in particular the supply and generation of electricity, and the promotion of electricity generation from renewable sources. This thesis examines ways of addressing the challenges of electricity generation and access to electricity, through the instrumentality of law. The aim is to analyse functions of the law vis-à-vis the legal and regulatory framework for renewables, and not to examine and critique the legal systems of both or either country.

Secondly, the focus of this thesis is on achieving SE by increasing the uptake of RE for electricity generation (that is, energy diversification). Consequently, other strategies for achieving SE, such as measures to improve energy conservation and energy efficiency, are outside of the scope of this work, although this may warrant separate studies in the future.

Thirdly, this thesis focuses only on the electricity sector. It does not cover measures to encourage renewables in other sectors, such as transport.

Finally, this thesis will not consider the adequacy of Nigeria's commitments to clean energy in fulfilment of the country's obligations to take action to mitigate or adapt to climate change under the United Nations Framework Convention on Climate Change, or the Paris Agreement.[52] Although climate change may be one of the reasons why Nigeria embraces RE, this study will focus on the adequacy of Nigeria's laws to increase the uptake of RE for

[52] *United Nations Framework Convention on Climate Change*, Adopted 14 June 1992, UNCED Doc A/CONF.151/5/Rev.1, (Vol I), Annex I, 13 June 1992, 31 *ILM* 874 (1992); *United Nations Framework Convention on Climate Change*, Conference of the Parties, Adoption of the Paris Agreement, Dec. 12, 2015, U.N. Doc. FCCC/CP/2015/L.9/Rev/1 (Dec. 12, 2015).

electricity generation, and make suggestions for law reform, but will not critique the measures in terms of their adequacy in achieving climate change mitigation targets or goals.

1.5 Structure of this Thesis

This thesis will be arranged into five further chapters.

Chapter 2, 'Sustainable Energy and Sustainable Development', will identify and explain key concepts referred to throughout this thesis. First, the meaning and content of the fundamental concepts of 'renewable energy', 'sustainable energy' and 'sustainable development', as they are used in the context of this thesis, will be defined, as will the links between these concepts. This chapter will then explain some key measures for encouraging the uptake of renewable electricity to achieve SE and SD, which are widely used across the globe, and examine the role of legislation in achieving SE. Also in this chapter, the study will analyse Nigeria's approach to SE.

Chapter 3, 'Nigeria's Energy Sector', will critically analyse the regulation of the electricity sector in Nigeria. It opens with an overview of Nigeria's energy sector, including statistics on the major energy sources in Nigeria, and patterns of consumption and supply of electricity. It proceeds to trace the history of electricity generation in Nigeria, and the structure of the electricity industry, from the time preceding independence to present-day Nigeria. The chapter then describes and critically analyses the legal and regulatory framework as it pertains to encouraging RE-sourced electricity, and the rural electrification programme (REP), in Nigeria, in order to identify gaps and other deficiencies in the legal and regulatory framework.

Chapter 4, 'Overview of the Energy Sector in Kenya', will critically analyse the regulation of the electricity sector in Kenya. Similarly to Chapter 3, Chapter 4 will open with a discussion of Kenya's energy sector and the history of electricity sector regulation and reform. It will then proceed to critically examine the legal and regulatory structure for renewable electricity in Kenya, and highlight some of the legal reforms and measures that have worked effectively in

Kenya to encourage the uptake of RE in the electricity sector, and improved access to electricity services.

Chapter 5, 'Comparative Study: Lessons for Nigeria', will undertake a comparative study of renewable electricity laws in Nigeria and Kenya with a view to drawing lessons for Nigeria. Chapter 6 sets forth the conclusion and recommendations that are drawn from the case studies in this thesis.

CHAPTER 2

SUSTAINABLE ENERGY AND SUSTAINABLE DEVELOPMENT

The pursuit of SE, which is seen as necessary for SD, has been the focus of humankind for many years now.[53] RE and SE are integral to achieving SD goals. In particular, RE is becoming a preferred choice, in place of fossil fuels, when making decisions on how to address the challenges of people without electricity and ensure access to modern electricity without unduly compromising the environment. That the country should pursue and achieve SE, through an increased uptake of renewable electricity, is firmly established in Nigeria's energy policy.

Legislation is required to ensure the increased uptake of electricity from renewable sources, in order to overcome various barriers to commercial exploitation. The traditional role of legislation as simply a tool for the regulation of the electricity industry has changed. Legislation is now seen as having a crucial role in the promotion of renewable electricity, and hence SD. The first section of this chapter will examine the relationship between SD, SE and RE, particularly in the context of the crucial goal of energy security, and the meaning of SE in the Nigerian context. The second section will examine Nigeria's approach to SE. The third section of this chapter will examine the role of legislation in SD, and briefly describe some of the key legislative measures commonly used across the globe to encourage electricity generation from renewable sources. This will set the context for the critical analysis of law in Chapters 3 and 4, and the recommendations for law reform in Chapter 5.

[53] Tomislav Klarin, 'The Concept of Sustainable Development: From its Beginning to the Contemporary Issues' (2018) 21(1) *Zagreb International Review of Economics & Business* 67. Since the publication of the Brundtland report in 1987, sustainable development has influenced the development of international environmental law. See, Nabaat T Mahbub, 'Sustainable Development and its Evolution in the Realm of International Environmental Law' (2016) 7(1) *Nnamdi Azikiwe University Journal of International Law and Jurisprudence* 1, 14.

2.1 Sustainable Development, Sustainable Energy and Renewable Energy

2.1.1 Sustainable Development

According to Russell, '[t]he term "sustainability" has a range of meanings. Perhaps the most common use of the term today is within the context of sustainable development'.[54] The origin of SD can be traced to the 1987 report of the World Commission on Environment and Development, *Our Common Future*.[55] SD, in the report, is defined as a 'development that meets the needs of the present without compromising the ability of future generations to meet their own needs'.[56] Other authors have attempted to further define and/or describe the concept of SD, building on the commission's definition. SD encompasses three core elements: economic growth, social equity and environmental quality. These elements are commonly referred to as the 'triple bottom line'.[57] For a state to attain development that qualifies as being sustainable, these three elements will have to be guaranteed. In other words, governments should promote the security of the needs of the people by removing any inequality in the present use of resources, which may impair the inalienable rights of future generations.[58]

At the heart of SD is a reliable energy supply that supports development over time. SD thrives when there is an obligation to produce and use energy in a manner that supports development objectives. Scholars have attempted to define sustainability in the context of the energy system based on this relationship between development and energy use, hence the emergence of the term 'sustainable energy'.[59]

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[54] Irma S Russell, 'The Sustainability Principle in Sustainable Energy' (2013) 44(1) *Tulsa Law Review* 121, 121.

[55] G H Brundtland, *Report of the World Commission on Environment and Development: Our Common Future*, United Nations General Assembly Document (1987) A/42/427 <https://sustainabledevelopment.un.org/content/documents/5987our-common-future.pdf>.

[56] Klarin (n 53) 68; Rachel Emas, *The Concept of Sustainable Development: Definition and Defining Principles* (Brief for GSDR, 2015) 2.

[57] Klarin (n 53) 68.

[58] Emilio Padilla, 'Intergenerational Equity and Sustainability' (2002) 41 *Ecological Economics* 69, 73, 76.

[59] Ivan Vera and Lucille Langlois, 'Energy Indicators for Sustainable Development' (2007) 32 *Energy* 875, 882.

2.1.2 Sustainable Energy

SD cannot be achieved without SE. Worika describes SE as 'energy that is capable of meeting the needs of present generation without compromising the ability of future generation to meet their own energy needs'.[60] According to the World Energy Assessment, SE is 'energy produced and used in ways that support human development over the long term in all its social, economic and environmental dimensions'.[61] Similarly, Munasinghe defines SE as 'involving the harnessing of energy resources for human use in a manner that supports lasting development'.[62] Oyedepo also describes SE as involving:

> the provision of energy services in a sustainable manner, which in turn necessitates that energy services be provided for all people in ways that, now and in the future, are sufficient to provide the basic necessities, affordable, not detrimental to the environment, and acceptable to communities and people.[63]

In all of these definitions, it is clear that energy use must not only support development over time; it must also be secure and reliable, as well as environmentally friendly. Energy must be available from generation to generation to be regarded as sustainable. Thus, three elements can be distilled from the definitions of SE: energy security, energy equity and environmental sustainability.[64] Each of these elements will now be discussed.

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[60] Ibibia Worika, 'Energy Development and Utilization in Africa' in Adrian J Bradbrook, Rosemary Lyster, Richard L. Ottinger and Wang Xi (eds), *The Law of Energy for Sustainable Development* (Cambridge University Press, 2005) 324, 327.

[61] United Nations Development Programme (UNDP), *World Energy Assessment: Energy and the Challenge of Sustainability* (2000) 3 <http://www.undp.org/content/dam/aplaws/publication/en/publications/environment-energy/www-ee-library/sustainable-energy/world-energy-assessment-energy-and-the-challenge-of-sustainability/World%20Energy%20Assessment-2000.pdf>.

[62] Mohan Munasinghe, 'Sustainable Development: Basic Concepts and Application to Energy' (2004) 6 *Encyclopaedia of Energy* 1, 1.

[63] Sunday Oyedepo, 'Energy and Sustainable Development in Nigeria: The Way Forward' (2012) 2(15) *Sustainability and Society* 1, 11.

[64] Oliver Wyman, *World Energy Trilemma: Time to Get Real – The Case for Sustainable Energy Investment* (World Energy Council 2013) 7 <https://www.worldenergy.org/assets/images/imported/2013/09/2013-Time-to-get-real-the-case-for-sustainable-energy-investment.pdf>.

(a) Energy Security

Energy security is a major driver of SE. It is a dynamic concept in that its definition depends on the circumstances of a country's energy sector.[65] While some authors examine energy security in terms of affordability and/or availability of energy, others consider it in terms of technology advancement, energy efficiency or energy infrastructure.[66] According to the International Energy Agency (IEA), energy security means 'the uninterrupted availability of energy sources at an affordable price'.[67] The Intergovernmental Panel on Climate Change (IPCC) identified availability and reliability to be the core of energy security when it stated that, 'at a general level, energy security can best be understood as robustness against (sudden) disruptions of energy supply. More specifically, availability and distribution of resources, as well as variability and reliability of energy supply can be identified as the two main themes.'[68] The definition of energy security by the IPCC presupposes a carefully planned system of energy production, a system that promotes availability and reliability of the energy system, such that the system will be able to respond to any sudden change in supply. It requires measures designed to reduce fluctuations in energy supply and prices.[69] Diversification in the electricity mix is a key means of improving energy security.

In this thesis, the term 'energy security' encompasses the availability, reliability and affordability of energy. This is relevant to understanding the concept of SE in the Nigerian context, a point which is explained more fully in Section 2.2.

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[65] Abdelrahman Azzuni and Christian Breyer, 'Definitions and Dimensions of Energy Security: A Literature Review' (2018) 7 *WIRES Energy Environ (Advanced Review)* 1, 2.

[66] B W Ang, W L Choog and T S Ng, 'Energy Security: Definitions, Dimension and Indexes' (2015) 42 *Renewable and Sustainable Energy Reviews* 1077, 1081–2.

[67] International Energy Agency, *What is Energy Security* <https://www.iea.org/topics/energysecurity/whatisenergysecurity/>.

[68] W Moomaw, F Yamba, M Kamimoto, L Maurice, J Nyboer, K Urama and T Weir, 'Renewable Energy and Climate Change' in O Edenhofer, R Pichs-Madruga, Y Sokona, K Seyboth, P Matschoss, S Kadner, T Zwickel, P Eickemeier, G Hansen, S Schlömer and C Von Stechow (eds), *Renewable Energy Sources and Climate Change Mitigation: Special Report of the Intergovernmental Panel on Climate Change* (Cambridge University Press, 2011) 161, 191.

[69] Ang et al (n 66) 1081.

(b) Energy Equity

Energy equity, the second element, has to do with access to energy supply across generations.[70] There are two forms of equity that are relevant to the concept of energy equity: intra-generational equity and intergenerational equity. Intra-generational equity has to do with access to energy by nations and communities within one generation. Intergenerational equity, on the other hand, refers to the availability of energy from one generation to another.[71] Energy equity, in this thesis, will mean (a) ensuring more equal access to energy between the urban and rural population, and (b) securing the availability of electricity from generation to generation. Ensuring the supply of secure, equitable and affordable energy that supports development goals is important not only to present, but also future generations. It is important that Nigeria's laws and policies leave future generations on par with the present generation, or provide future generations with better possibilities for development than exist today; they should be no worse off.

(c) Environmental Sustainability

The last element, environmental sustainability, has to do with environmental impact mitigation through energy production from low-carbon sources.[72] In the context of this thesis, it means that Nigeria's efforts to meet electricity demand must also be environmentally friendly to be classed as 'sustainable energy' and lead to 'sustainable development'.

Although these elements are presented separately, they are interlinked. For example, in Africa, the lack of access to modern energy services by the rural poor is an issue of both energy security and energy equity. Lack of electricity access is a major cause of underdevelopment in Africa. Although there is a projection that by 2040 about 1 billion people in Africa will have

[70] Julia Tomei, Danielle Gent and Emma Wilson, 'Reflections and Recommendations' in Julia Tomei, Danielle Gent and Emma Wilson (eds), *Equity and the Energy Trilemma: Delivering Sustainable Energy Access in Low-Income Communities* (International Institute for Environment and Development, 2015) 70, 72; Wyman (n 64) 8.

[71] Sharon Beder, 'Costing the Earth: Equity, Sustainable Development and Environmental Economics' (2000) 4 *New Zealand Journal of Environmental Law* 227, 227, 229.

[72] Wyman (n 64) 7.

electricity access, another 530 million people (mostly in the rural areas of sub-Saharan Africa) will be without electricity on account of population increase.[73] Addressing the inequality in electricity access between urban and rural areas, by ensuring access to affordable modern energy services in rural areas, is a major challenge in developing countries, including Nigeria.[74] Achieving rural electrification can be analysed as an issue of security, equity or both.

Energy systems must address energy security, equity and environmental sustainability to be regarded as sustainable, that is, people should have access to affordable clean energy from generation to generation. Sustainability in this context refers to 'a capacity to maintain some entity, outcome, or process over time',[75] while access means 'access to modern and clean energy by the population'.[76] In reality, addressing these elements simultaneously remains a challenge for policy makers, and thus these elements are dubbed the 'energy trilemma'.[77] The priority area in some countries is energy security objective, that is, availability of affordable electricity, while in some it is the protection of the environment. [78] Policy makers are now looking to address the energy trilemma by increasing the uptake of energy from low-carbon sources that do not put future use at risk of depletion as well as setting priority areas.[79] This brings us to the crucial role of RE in achieving SE and therefore SD.

[73] International Energy Agency (IEA), *Africa Energy Outlook: A Focus on Energy Prospects in Sub-Saharan Africa* (2014) 3, 122; International Centre for Trade and Sustainable Development (ICTSD), 'Harnessing Renewable Energy for Sustainable Development' (2018) 7(3) *Bridges Africa* 3.

[74] Subhes C Bhattacharyya, 'Energy Access and Development' in Andreas Goldthau (ed), *The Handbook of Global Energy Policy*, (John Wiley & Sons, 2013) 227.

[75] W Jenkins (ed), *Berkshire Encyclopaedia of Sustainability Vol 1: The Spirit of Sustainability*, cited in Klarin (n 53) 69.

[76] Bhattacharyya (n 74) 227.

[77] Robert Blinc, Aleksander Zidansek and Ivo Slaus, 'Sustainable Development and Global Security' (2007) 32 *Energy* 883, 890.

[78] David Toke and Sevasti-Eleni Vezirgiannidou, 'The relationship between climate change and energy security: key issues and conclusion' (2013) *Environmental Politics* 537, 537.

[79] Ibrahim Dincer, 'Renewable Energy and Sustainable Development: A Crucial Review' (2000) 4 *Renewable and Sustainable Energy Review* 157, 171.

2.1.3 Renewable Energy and Sustainable Energy

(a) Definition of Renewable Energy

The IEA defines RE as follows:

> Renewable Energy is derived from natural processes that are replenished constantly. In its various forms, it derives directly or indirectly from the sun, or from heat generated deep within the earth. Included in the definition is energy generated from solar, wind, biofuels, geothermal, hydropower and ocean resources, and biofuels and hydrogen derived from renewable resources.[80]

The idea of 'replenishment' or 'non-depletion' is essential to the identification of resources as 'renewable'. This is reflected, for example, in Nigeria's Renewable Electricity Policy Guidelines (REPG), which defines RE as 'energy from a source that does not result in the depletion of the earth's resources whether this is from a central or local source'.[81] Similarly, Nigeria's National Renewable Energy and Energy Efficiency Policy (NREEEP) also refers to RE as 'energy obtained from energy sources whose utilization does not result in the depletion of the earth's resources'.[82]

A second feature, not captured by the IEA definition, is that RE has minimal environmental impacts. This can be controversial, as it would exclude large hydropower, as the dams constructed for these projects can have extensive impacts on the surrounding environment, including relocation of local people. In Nigeria, the NREEEP reflects the concept of RE sources having minimal environmental impacts, as it also defines RE to include 'energy sources and technologies that have minimal environmental impacts, such as less intrusive hydro's and certain biomass combustion'.[83]

Thirdly, RE can be defined by identifying sources or technologies as 'renewable'. Thus, for example, the NEP, Nigeria's main energy policy, does not contain a broad definition of RE but

[80] Rodney Janssen, *Renewable Energy into the Mainstream* (Renewable Energy Working Party, International Energy Agency, 2002) 9.
[81] FMPS, *Renewable Electricity Policy Guidelines* (n 19) 4.
[82] FMP (n 20) 1–2.
[83] Ibid.

rather a description of sources that are renewable, namely, solar, wind, hydro, biomass, ocean waves, tidal and geothermal.[84] Such an approach may also specially exclude certain resources from being 'renewable' energy sources. For example, the Energy Act of Kenya defines RE as 'all non-fossil sources including, but not limited to biomass, geothermal, small hydropower, solar, wind, sewage treatment and plant gas'.[85] It thus excludes fossil fuels.

This thesis will adopt the definition of RE in the NREEEP which refers to non-depleting sources, and to energy sources and technologies. Reference to RE technologies in government policy is a welcome development in view of the fact that the use of these technologies is recognised as one important way of providing electricity access in rural areas.[86] RE is sometimes also referred to as 'alternative energy', that is, 'resources whose production requires capital input'.[87] In this thesis, 'alternative energy' will have the same meaning as RE, whilst reference to renewable electricity will mean electricity generated from a RE source.

(b) The Importance of Renewable Energy in Achieving SE and SD

Globally, RE is seen to have a fundamental role in achieving energy security. The search for energy sources that can promote energy security can be traced to the 1973 energy crisis, when an embargo imposed on the United States of America by Arab oil producers led to an astronomical increase in the price of oil.[88] It was thought generally that the finite nature of oil, coupled with limited access to clean and affordable energy, would impact on SD, especially in developing countries.[89] Developed countries decided to develop RE sources in response to the impending global energy insecurity. Thus, energy policies around the world started focusing on

[84] ECN, *National Energy Policy* (n 8) 3, 34.
[85] Energy Act 2006 s 2.
[86] FMPS, *Renewable Electricity Policy Guidelines* (n 19) 3.
[87] Raul A Barreto, 'Fossil Fuels, Alternative Energy and Economic Growth' (2018) 75 *Economic Modelling* 196, 196.
[88] Carolyn Fischer and Louis Preonas, 'Combining Policies for Renewable Energy: Is the Whole Less than the Sum of Its Parts?' (Resources for the Future, Discussion Paper, March 2010) 1 <http://www.rff.org/files/sharepoint/WorkImages/Download/RFF-DP-10-19.pdf>.
[89] United Nations, *Report of the United Nations Conference on New and Renewable Sources of Energy* (United Nations A/CONF.100/11, 10–21 August 1981) 25, 56, 68 <https://digitallibrary.un.org/record/25034/files/A_CONF-100_11-EN.pdf>.

a system that could decrease dependency on imported oil. Given the volatile prices of fossil fuel energy and the depletion risk, increasing the use of RE was considered a useful strategy to promote the security of the energy system.[90] The strategy of energy replacement, which is the focus of this thesis, targets the replacement of fossil fuels by the use and exploitation of energy sources whose supply can be guaranteed over time.[91] At the heart of energy replacement is the diversification of energy sources to include energy from sources whose supply is infinite, namely, RE.[92]

Energy security is not, however, equivalent to SE. For this, energy must also be affordable, promote equity and have minimal environmental impacts. Jefferson identifies four basic criteria which an energy source should meet to be sustainable. First, exploitation of energy resources should not result in depletion (that is, it should be infinite). Second, deployment of energy resources should produce minimal impact on the environment. Third, human hazards must be minimal, and lastly, the exploitation should not perpetuate injustices among generations.[93]

Although fossil fuels have contributed to the development of the world economy, with coal in particular seen to provide a reliable and low-cost source of power (leaving aside issues of subsidies and pricing externalities), there are concerns over the long-term availability of fossil fuels, and the negative impacts of these energy sources on the environment. The finite nature of fossil energy negates the fundamental principle of intergenerational equity, given that there is a possibility of fossil energy being depleted over time. In addition, burning fossil fuels releases carbon, a major driver of climate change.[94] Fossil energy does not satisfy all the requirements needed for a sustainable energy system. For these reasons, most importantly the failure to

[90] International Energy Agency (IEA), *Developing Renewables 2011: Best and Future Policy Practice, Markets & Policies* (2011) 66 <https://www.iea.org/publications/freepublications/publication/Deploying_Renewables2011.pdf>.
[91] Henrik Lund, 'Renewable Energy Strategies for Sustainable Development' (2007) 32 *Energy* 912, 912.
[92] Ben W Ebenhack and Daniel M Martinez, *The Path to More Sustainable Energy Systems: How Do We Get There from Here?* (Momentum Press, 2013) 22.
[93] Michael Jefferson, 'Sustainable Energy Development: Performance and Prospects' (2006) 31 *Renewable Energy* 571, 573.
[94] Ibid 572; Ebenhack and Martinez (n 92) 22.

guarantee long-term availability, fossil energy is regarded as not sustainable.[95] In contrast, renewable electricity has a number of benefits. RE is cleaner, with minimal impact on the environment. It reduces carbon emissions, a major cause of climate change.[96] According to the IPCC, every strategy aimed at fighting climate change should focus on means of reducing electricity production from fossil fuel sources.[97]

Secondly, RE promotes energy security and equity, because it is non-depleting, ensuring energy availability from generation to generation.[98] Increasing the share of electricity from RE sources also diversifies the electricity mix and reduces a country's reliance on one form of energy technology, thereby promoting energy security. RE is deployed for electricity generation so as to ensure electricity availability at all times.[99]

Moreover, RE enables power system decentralisation, which gives governments a variety of opportunities to address the plight of the millions of people without access to modern energy services, including the specific needs of areas that are not connected to the grid, as well as expanding electricity access in a timely and sustainable manner.[100] The use of RE technologies, including the adoption of distributed RE generation systems (such as rooftop solar) and, more recently, standalone systems and mini- or micro-grids, is crucial to providing electricity access to many rural communities in Africa, and also in facilitating the use of fossil energy in a

[95] Ebenhack and Martinez (n 92) 22.

[96] Omorogbe, 'The Role of Law' (n 1) 209.

[97] Intergovernmental Panel on Climate Change (IPCC), 'Climate Change 2007-Mitigation of Climate Change', (Fourth Assessment Report of the Intergovernmental Panel on Climate Change, Cambridge University Press, 2007) 256.

[98] Penguins on Thin Ice, 'What is "Sustainable Energy"?' (Sustainable Energy and Development Fact Sheet) <http://www.penguinsonthinice.com/Sustainable%20Energy%20and%20Development%20fact%20sheet.pdf>.

[99] Johansson (n 2) 49; World Nuclear Association, *Sustainable Energy* (2013) <http://www.world-nuclear.org/information-library/energy-and-the-environment/sustainable-energy.aspx>.

[100] A Iwayemi, C Diji, B Awotide, A Adenikinju and P Obute, *Towards Sustainable Universal Electricity Access in Nigeria* (Centre for Petroleum, Energy Economics and Law, 2014) 58; Lincoln L Davies, 'Reconciling Renewable Portfolio Standards and Feed-in Tariffs' (2012) 32(2) *Utah Environmental Law Review* 311, 316. A decentralised energy system enhances the exploitation of the locally available renewable energy resources, and works in remote communities that are not connected to national grids. See Kakkan Ramalingam and Chandrasen Indulkar, 'Solar Energy and Photovoltaic Technology' in G B Gharehpetian and Mousavi M S Agah (eds), *Distributed Generation System: Design, Operation and Grid Integration* (Elsevier, 2017) 69, 69; International Renewable Energy Agency (IRENA), *Policies and Regulations for Renewable Energy Mini-Grids* (2018) 6.

climate-friendly manner.[101] According to Nagpal and Parajuli, 'off-grid renewable energy systems have the ability to deliver secure and affordable electricity to rural communities all over the world, and are important in breaking a cycle of energy poverty that has affected the socio-economic progress of millions of people'.[102] RE technologies may be deployed where grid expansion is not economically feasible, and tailored to suit the local conditions.[103]

The international community has also recognised the crucial role RE will play in addressing energy insecurity and achieving SD. In 1981, the United Nations convened in Nairobi a global conference on the need to develop new energy resources. The conference considered the possibility of adopting an energy system that would embrace new and RE resources in place of fossil fuels.[104] The Nairobi conference drew the attention of countries around the world to 'the impending transition from a world economy based on commercial fuels as a dominant energy-source to one that relies on an energy mix in which renewable sources of energy will play an increasing important role'.[105]

In the same vein, the 9th Session of the United Nations Commission on Sustainable Development, held in Rio de Janeiro in 2001, urged countries all over the world to develop a sustainable pattern of energy production and distribution using alternative energy sources.[106] One recommendation of the Rio conference was the necessity of energy transition in rural areas using RE resources to aid energy access and SD. The conference found that a relationship exists between a steady supply of energy and SD, and thus advocated a transition from fossil

[101] Jefferson W Tester, Elizabeth M Drake, Michael J Driscoll, Michael W Golay and William A Peters, *Sustainable Energy: Choosing Among Options* (MIT Press, 2nd ed, 2012) 9; United Nations Department of Economic and Social Affairs, *Improving Sustainable Energy Access for Rural Areas* (8 January 2014) <http://www.un.org/en/development/desa/news/sustainable/rural-energy-access.html>.

[102] Divyam Nagpal and Bishal Parajuli, *Off-grid renewable energy solutions to expand electricity access: An opportunity not to be missed*, (International Renewable Energy Agency, Abu Dhabi, 2019) 3. .

[103] Off-grid electricity is one of the recognised gateways to modern clean electricity and one of the cost-competitive options for expanding electricity access. See International Renewable Energy Agency (IRENA), *Off-Grid Renewable Energy Solutions to Expand Electricity Access: An Opportunity Not to be Missed* (2019) 5

[104] United Nations, *Report of the United Nations Conference on New and Renewable Sources of Energy* (n 89).

[105] Margaret R Biswas, 'United Nations Conference on New and Renewable Sources of Energy, Held in Nairobi, Kenya, During 10–21 August 1981' (2009) 8(4) *Environmental Conservation* 330, 331.

[106] United Nations Commission on Sustainable Development, *Report on the Ninth Session, Economic and Social Council Official Record* (Supplement No 9, 5 May 2000 and 16–17 April 2001) 1, 14 <http://www.un.org/ga/search/view_doc.asp?symbol=E/CN.17/2001/19%20(SUPP)&Lang=E>

energy to RE.[107] The recommendation of the Rio conference on the role of RE was endorsed at the 2002 World Summit on Sustainable Development in Johannesburg.[108]

The international community has now acknowledged the role of RE in achieving SE and thereby SD.[109] It is accepted that transitioning from fossil energy to RE will secure energy use, and open up new possibilities for achieving higher standards of living.[110] The adoption of a system that incorporates electricity from RE sources is a strategy for sustainable growth and developments.[111] The transition should cut across every strata of the society, with special consideration given to rural areas to promote SD and access to electricity for all.[112]

2.2 Sustainable Energy in Nigeria

To understand the meaning of SE in Nigeria, one must begin with the 1970s oil shock. This crisis saw Nigeria earning a substantial amount in revenue from the export of crude oil, which was a major source of foreign income.[113] However, Nigeria also suffered a rising inflation rate and neglect of the other sectors of the economy.[114] Nigeria, though a major exporter of crude oil (in the 1970s and now), relied on imported petroleum products (gas, premium motor spirit (petrol), diesel and kerosene) to meet its energy requirements.

Coal was the earliest source of electricity generation in Nigeria.[115] Nigeria later embraced the use of hydro and crude oil between the period after the independence in 1960 and the Nigeria

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[107] United Nations, *Agenda 21, United Nations Conference on Environment & Development, Rio de Janeiro* (3–14 June 1992) paras 14.92, 14.98. <https://sustainabledevelopment.un.org/content/documents/Agenda21.pdf>.

[108] UNDP (n 61) i, iii.

[109] United Nations, *Report of the United Nations Conference on New and Renewable Sources of Energy* (n 89) 60.

[110] Fischer and Preonas (n 88) 2; Davies (n 100) 316–17.

[111] Mark Lambrides, John A Armstrong and Jan Hamrin, *The Renewable Energy Policy Manual* (United States Export Council for Renewable Energy, 2000) <http://www.oas.org/usde/publications/Unit/oea79e/oea79e.pdf>.

[112] Vijay Modi et al, *Energy and the Millennium Development Goals* (Energy Sector Management Assistance Programme, United Nations Millennium Project and World Bank, 2005) 2–4.

[113] Brian Pinto, Nigeria During and After the Oil Boom: A Policy Comparison with Indonesia' (1987) 3(1) *World Bank Economic Review* 419; Anthony E Akinlo, 'How Important is Oil in Nigeria's Economic Growth?' (2012) 5(4) *Journal of Sustainable Development* 165.

[114] Pinto (n 113).

[115] Nobert Edomah, Historical Drivers of Energy Infrastructure Change in Nigeria (1800-2015) <https://www.intechopen.com/books/energy-management-for-sustainable-development/historical-drivers-of-energy-infrastructure-change-in-nigeria-1800-2015->; Olayinka I Ogunsola, History of Energy Sources and Their-Utilization in Nigeria (1990) 12(2) Energy Sources 181.

civil war.[116] Although coal remained one of the sources of electricity generation at this time, crude oil and hydro were the main sources of electricity generation. In the 1980s, Nigeria switched to natural gas as the principal source of electricity generation, but much of this gas was imported.[117] Despite being endowed with generous hydrocarbon resources, there was little gas production in Nigeria, with most natural gas being flared as a by-product of crude oil production.[118]

As a result of the crisis in the international oil market, there was an astronomical increase in the prices of essential goods and services in the local markets, including electricity.[119] The country could not generate sufficient electricity due to the inability to deliver the right volume of gas for electricity generation.[120] As a consequence of the price increase, inflation became a threat to the security of the country's energy system, including the security of electricity supply. Nigeria found it increasingly difficult to continue to import petroleum products (including gas) for

[116] The first hydro-electric power plant was constructed in 1962 following the creation of the Niger Dam Authority (NDA). See, Norbert Edomah, Chris Foulds and Aled Jones, 'Energy Transitions in Nigeria: The Evolution of Energy Infrastructure Provision (1800–2015)' (2016) 9 *Energies* 1; O I Okoro, Edward Chikuni and Poobalan Govender, 'Power Sector Reforms in Nigeria: Opportunities and Challenges' (2007) 18(3) *Journal of Energy in South Africa* 52, 52.

[117] Vincent Emodi, *Energy Policies for Sustainable Development Strategies: The Case of Nigeria* (Springer, 2016) 26. Some gas turbine plants were started and/or completed around this period: Sapele Plant was completed in 1981; Egbin plant was completed between 1985 and 1986; Afam I-IV completed between 1982 and 2002; etc. See, Kayode Oladipo, Agbetuyi A. Felix, Owolabi Banjo, Obiakor Chukwuemeka and Fagbuaro Olawale, Power Sector Reform in Nigeria: Challenges and Solutions' (2018) 413 *Material Science and Engineering* 1, 5.

[118] In 1979, Nigeria enacted the Associated Gas Reinjection Act in a bid to stop flaring of associated gas by (foreign) oil companies. See, Associated Gas Re-injection Act 1979, s 3; Uwem Udok and Enobong Bassey Akpan, Gas Flaring in Nigeria: Problems and Prospect' (2017) 5(1) *Global Journal of Politics and Law Research* 16, 19.

[119] C S Rapu, A O Adenuga, W J Kanya, M O Abeng, P D Golit, M J Hilili, I A Uba and R Ochu, *Analysis of Energy Market Conditions in Nigeria* (Central Bank of Nigeria, Occasional Paper No 55, 2015) 52; Isabel Galiana, *Post-2015 Development Agenda: Nigeria Perspectives*, (Copenhagen: 2015) 1, 4 <https://www.copenhagenconsensus.com/sites/default/files/nigeria_energy_resource_packet.pdf>; Obasesam Okoi, *The paradox of Nigeria's oil dependence* (Africa's Portal 21 January, 2019) <https://www.africaportal.org/features/paradox-nigerias-oil-dependency/>.

[120] Advisory Power Team, 'Nigeria Power Baseline Report' Office of the Vice President (Federal Republic of Nigeria: August 2015) 1, 17; Elisha Bala-Gbogbo **'**Africa's biggest crude producer remains stuck on imported fuels', World Oil 21 October, 2019. Undeveloped local markets, absence of infrastructural supports and lack of commitments by the foreign oil companies to develop gas production in Nigeria are the major causes of gas flaring in Nigeria. See Aderonke Adejugbe and Bayo Onomade, 'Gas Flaring in Nigeria: Challenges and Investment Opportunities, Strachan Partner (31 July, 2014) <https://www.mondaq.com/nigeria/oil-gas-electricity/331578/gas-flaring-in-nigeria-challenges-investment-opportunities>; Udok and Akpan (n 119) 17-18; PricewaterhouseCoopers (PwC), Assessing the Impact of Gas Flaring on the Nigerian Economy, (PwC 2019) 10 <https://www.pwc.com/ng/en/assets/pdf/gas-flaring-impact1.pdf>.

electricity generation, because of the impact of the inflation on the economy. Nigeria's switch to gas-based electricity, and overdependence on it, had in fact deepened the energy crisis.[121] The electricity supply structure was not reliable, worsening energy insecurity in the country.[122] Moreover, population growth was also a source of concern to the government, as it was faced with the challenges of addressing energy needs then and in the future.

Consequently, by the early 1980s Nigeria was ready to diversify its energy base to reduce reliance on imported petroleum products, and planned to achieve this by embracing alternative energy sources.[123] Nigeria set three directions for the proposed diversification: investigating the use of crop and wood plantations (biomass), solar energy, and increased use of hydropower for electricity.[124] The strategy was, among other things, to address the challenges of energy insecurity and the unreliability of the supply system, which had affected electricity supply in the country.[125] However, the proposed strategy could not be pursued, in part because of the absence of an energy policy to drive it. It was not until 2003 that the NEP was approved as the first comprehensive energy policy in Nigeria.[126]

By the time the NEP was approved in 2003, the need to generate electricity from all available energy sources in Nigeria, including RE, as a panacea to energy insecurity was clearly spelt out in the nation's energy policy. The NEP aims to expand the sources of electricity generation in the country to ensure availability, reliability and affordability for sustainable economic growth and development,[127] in order to generate sufficient electricity to meet the needs of the

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[121] Sam Amadi, *The Expectations of Nigerian Consumers of Electricity Under a Post Privatization Era: Issues & Perspectives* (Presentation, Consumer Rights Project, Lagos, 14 March 2014) <https://nerc.gov.ng/doclib/nerc-papers-and-presentations/300-the-expectations-of-nigerian-consumers-of-electricity-under-a-post-privatization-era-issues-perspectives-march-14-2014/file>.

[122] ECN, *National Energy Policy* (n 8) 5.

[123] United Nations, *Report of the United Nations Conference on New and Renewable Sources of Energy* (n 89) 113.

[124] Ibid. The hydro envisaged in this proposal is small hydro. This is because Nigeria started deploying large hydro for electricity following the creation of the Niger Dam Authority in 1962.

[125] ECN, *National Energy Policy* (n 8) 4.

[126] There was an attempt in 1984 to produce a Draft Energy Policy Guideline by the then Federal Ministry of Science and Technology. A similar attempt by the Energy Commission of Nigeria to develop a Draft Energy Policy in 1993 did not see the light of the day. See ECN, *National Energy Policy* (n 8) 2.

[127] Ibid 36.

population, now and in the future. Sustainable electricity generation in Nigeria is generation that seeks to promote the security of the electricity generation and supply system (both on-grid and off-grid) as well as enhancing access to environmentally friendly electricity.[128]

Since 2003, subsequent electricity policy has continued to support diversification of electricity generation sources to include non-depleting energy sources with minimal environmental impacts.[129] However, the intention is not to generate electricity from RE sources alone. Rather, Nigeria plans to broaden the sources of fuel for electricity generation by gradually including RE in the electricity mix to take care of any sudden change in fossil energy sources, which may affect electricity production.[130] RE will also be deployed to address the challenges of electricity access in the rural areas.[131]

The government's policy on the use of RE sources for electricity generation is also one of the highlights of its economic development policy, such as the Vision 20:20 Program.[132] The underlining assumption in the Vision 20:20 Program is that the use of RE in electricity generation will boost economic activities in the country, enable the country to satisfy immediate and future demand for electricity, and raise the living standards of the people of Nigeria.[133]

Apart from meeting the national energy security objective that flowed from the oil crisis, the decision to explore RE for electricity generation and SD also stems from Nigeria's commitment to international SD initiatives, and in particular a commitment to access to energy by the population. A 2017 World Bank report lists Nigeria as one of the 10 countries with the greatest

[128] Energy Commission of Nigeria, *Energy Implications of Vision 20: 2020 and Beyond* (Report No ECN/EPA/2014/01, 2014) 7.
[129] Olufolahan Osunmuyiwa and Agni Kalfagianni, 'Transitions in Unlikely Places: Exploring the Conditions for Renewable Energy Adoption in Nigeria' (2017) 22 *Environmental Innovation and Society Transition* 26, 26; Nnaemeka Emodi and Kyung-Jin Boo, 'Sustainable Energy Development in Nigeria: Overcoming Energy Poverty' (2015) 5(2) *International Journal of Energy Economics and Policy* 580, 585.
[130] ECN, *National Energy Policy* (above n 8) 36.
[131] Ibid 64.
[132] NPC (n 22) 13, 179.
[133] Felix B Dayo, *Clean Energy Investment in Nigeria: The Domestic Context* (International Institute for Sustainable Development (IISD), 2008) 8.

electricity access deficit in the world.[134] Whilst Nigeria relies on the national grid to supply electricity to urban areas, many villages are not connected to the grid.[135]

About 60% of the Nigerian population does not have access to grid electricity. Out of the 40% that currently has access to this electricity source, 72% reside in urban areas while the remaining 28% are in rural areas.[136] About 62% of the 60% who do not have access to electricity resort to the use of fuelwood to meet some of their energy requirements.[137] The rural population is heavily dependent on traditional energy sources (such as biomass) to satisfy their energy needs.[138]

Nigeria is a member of the United Nations, the African Union and the Economic Community of West African States, among others. Each of these associations has developed a SD document for the purposes of encouraging the use of RE to address the plight of citizens without electricity.[139] The search for solutions to the challenges of electricity access have led African countries to focus on the utilisation of indigenous energy resources for electricity generation.[140]

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[134] Sudeshna G Banerjee, Alejandro Moreno, Jonathan Sinton, Tanya Primiani and Joonkyung Seong, *Regulatory Indicators for Sustainable Energy: A Global Scorecard for Policy Makers* (World Bank Group, 2017) xvii, 7.

[135] N Bashir and B Modu, 'Techno-Economic Analysis of Off-grid Renewable Energy Systems for Rural Electrification in North-Eastern Nigeria' (2018) 8(3) *International Journal of Renewable Energy Research* 1217, 1217; Feranmi Akeredolu, 'IPPs are Vital to Nigeria's Power Sector, But Generation is Only a Part of the Solution', *Ventures Africa* (Online), 17 April 2018 <http://venturesafrica.com/independent-power-plants-are-vital-to-nigerias-power-sector-but-generation-is-only-a-part-of-the-solution/>.

[136] NACOP, Sustainable Energy for All Action Agenda (n 16) 12; Sunday O Oyedepo, Olufemi P Babalola, Stephen C Nwanya, Oluwaseun Kilanko, Richard O Leramo, Abraham K Aworinde, Tunde Adekeye, Joseph A Oyebanji, Abiodun O Abidakun and Orobome L Agberegha, 'Towards a Sustainable Electricity Supply in Nigeria: The Role of Decentralized Renewable Energy System' (2018) 2(4) European Journal of Sustainable Development Research 1, 11.

[137] Oyedepo et al, 'Towards a Sustainable Electricity Supply in Nigeria' (n 140) 3.

[138] FMP (n 20) 6; Emodi and Boo (n 133) 581; L N Chete et al, *Industrial Development and Growth in Nigeria: Lessons and Challenges* (Working Paper 10, Learning to Compete, 2014) <https://www.brookings.edu/wp-content/uploads/2016/07/L2C_WP8_Chete-et-al-1.pdf>.

[139] United Nations, *Sustainable Energy for All: An Overview* <http://www.un.org/millenniumgoals/pdf/SEFA.pdf>; African Union, 'Maputo Declaration' (Conference of African Ministers in Charge of Energy, Maputo, 1–5 November 2010) paras 14–16 <http://www.eueipdf.org/sites/default/files/field_publication_file/Declaration_of_Ministers_Conference_(Final_Version_9-11-2010).pdf>.

[140] Adrian J Bradbrook, 'Achieving Access to Modern Energy Services: A Study of Legal Strategies' in Yinka Omorogbe and Ada Ordor (eds), *Ending Africa's Energy Deficit and the Law: Achieving Sustainable Energy for All in Africa* (Oxford University Press, 2018) 26; Hugh Corder and Terhemen Andzenge, 'Regulation as a Catalyst for the Electrification of Africa' in Yinka Omorogbe and Ada Ordor, *Ending Africa's Energy Deficit and the Law: Achieving Sustainable Energy for All in Africa* (Oxford University Press, 2018) 71, 71.

Among other things, African countries are enjoined to put in place an energy system that will lead to energy transition in rural areas, including by supporting grid-connected and decentralised systems. Electricity transformation in rural areas, through rural electrification, is a strategy aimed at promoting access to energy for all.[141] Countries are enjoined to take steps to remove any obstacles to the realisation of rural electricity access by ensuring the existence of sound legal and regulatory frameworks.[142] As a member of the associations listed above, Nigeria is obligated to ensure access to modern clean energy services through the use of RE in power production.[143]

To summarise, a long-term objective for the sustainable exploitation and use of RE for electricity generation to achieve a diversified energy mix has been established in Nigeria's energy policy.[144] This is primarily to ensure that the nation's energy system supports SD, with availability of affordable and environmental-friendly electricity through a reliable supply system, now and in the future.[145] The development of energy resources for SD is a fundamental component of energy policy in Nigeria, and 'the overall thrust of the energy policy is the optimal utilization of the nation's energy resources for sustainable development'.[146] It is critical to understand that SE in Nigeria is defined in the context of the availability, affordability and reliability of electricity (energy security). The concept entails the development and use of energy resources (including RE), energy infrastructure and the satisfaction of development needs.[147] It suggests the Government should provide an environment that will enable the electricity-generating companies to deploy RE for electricity generation to promote access (energy equity) to environmentally friendly energy (environmental protection).[148]

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[141] Modi et al (n 112) 2–4; United Nations Commission on Sustainable Development (n 106) 3, 5.
[142] United Nations Department of Economic and Social Affairs (n 101); Alliance for Rural Electrification (ARE), *Rural Electrification* (2019) <https://www.ruralelec.org/rural-electrification>.
[143] NACOP, *Sustainable Energy for All Action Agenda* (n 16) 17, 47.
[144] NPC (n 22) 144.
[145] A S Sambo, 'Renewable Energy Electricity in Nigeria: The Way Forward' (Renewable Electricity Policy Conference, Abuja, 11–12 December 2006) 11.
[146] ECN, *National Energy Policy* (n 8) 8.
[147] Oyedepo, 'Energy and Sustainable Development in Nigeria' (n 63) 11.
[148] ECN, *National Energy Policy* (n 8) 64.

2.3 The Role of Legislation in Sustainable Energy Development

2.3.1 Rationale for Legislative Intervention

Historically, the role of energy law has been conceived as limited to the consideration of law and regulations for the exploitation of conventional energy.[149] This has, however, changed following developments in the electricity industry worldwide. Legislation has now evolved as a tool for promoting electricity generation from RE sources and energy sustainability.[150] It covers all aspects of the electricity industry as well as other aspects of the energy sector. The change in the role of legislation emanated from the worldwide privatisation and liberalisation witnessed in the electricity sector over the last two decades.[151] Apart from the regulatory function, legislation plays other roles in promoting SE, some of which are discussed below.

First, law gives effect to the provisions of energy policies by providing a binding precept for policies. The practice in some of the countries that have embraced RE is to develop policy for the regulation and exploitation of RE resources. Energy policy and energy law, however, belong to different realms, and the former cannot take the place of the latter.[152] Energy policy is a statement of a government's direction in the energy sector and it belongs to the realm of public administration. Law, on the other hand, is an instrument that renders policy statements binding, including determining how policy statements are to be implemented. Law is 'an essential accompaniment to policy, as the success of the latter is dependent on the efficacy of

[149] Adrian J Bradbrook, 'Energy Law as an Academic Discipline' (1996) 14(2) *Journal of Energy and Natural Resources Law* 193; Raphael J Heffron and Kim Talus, 'The development of energy law in the 21st century: a paradigm shift?' (2016) *Journal of World Energy Law and Business* 1, 3; Raphael J Heffron and Kim Talus, The evolution of energy law and energy jurisprudence: Insights for energy analysts and researchers' (2016) 19 *Energy Research and Social Science* 1, 1-2.

[150] Omorogbe, 'Promoting Sustainable Development through the Use of Renewable Energy (n 26); Heffron and Talus, The evolution of energy law and energy jurisprudence (n 149) 1-2; Raphael J Heffron, Anita Rønne, Joseph P Tomain, Adrian Bradbrook and Kim Talus, 'A treatise for energy law' (2018) 11 *Journal of World Energy Law and Business* 34, 35.

[151] Adrian J Bradbrook, 'The Development of Renewable Energy Technologies and Energy Efficiency Measures through Public International Law' in D N Zillman (ed), *Beyond the Carbon Economy: Energy Law in Transition* (Oxford University Press, 2008) 109.

[152] Omorogbe, 'The Role of Law' (n 1) 215.

its accompanying law'.[153] It is the law that makes the provisions of policy binding and not vice versa. It is also possible for a country to have both legal and economic policies on RE, but having RE legislation will ensure that the provisions of these policies on RE resources are harmonised and implemented.

Secondly, law creates enforceable agreements that help to remove uncertainties in the energy market. Fossil fuels have dominated energy markets for a long period thereby making it difficult for renewable-sourced electricity to penetrate. Unless there is a law to compel the adoption of these new technologies, developers may ignore them for conventional energy technologies.[154] According to von Danwitz, these new technologies cannot develop without a legal regime dedicated to their development, hence the need for a law that can promote their use.[155] Leaving the regulation of these resources and technologies to market forces creates uncertainty in energy markets.[156]

Thirdly, law aids the development of commercially exploitable RE resources. RE resources exist in different quantities, and not all of these resources can be exploited in commercial quantities.[157] Some countries enact laws to promote the exploitation of resources that are commercially viable among the RE resources.[158] The law can guide the exploitation of RE resources in a manner that balances economic and environmental interests in addition to ensuring human safety. Having an RE/energy law will also provide guidance as to how and for what purposes natural resources may or may not be used.[159]

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[153] Ibid 219.

[154] H Wiseman, L Grisamer and E N Saunders, 'Formulating a Law of Sustainable Energy: The Renewables Component' (2011) 28 *Pace Environmental Law Review* 827, 829.

[155] Thomas V Danwitz, 'Regulation and Liberalization of the European Electricity Market – A German View' (2006) 27 *Energy Law Journal* 423, 432.

[156] Allan E Bollard and Michael Pickford, 'New Zealand's "Light-Headed" Approach to Utility Regulation' (1995) 2 *AGENDA* 411.

[157] Adrian J Bradbrook, 'Sustainable Energy Law: The Past and the Future' (2012) 30 *Journal of Energy and Natural Resources Law* 511, 515.

[158] For instance, in Kenya geothermal is more viable than other renewable energy sources. The Government of Kenya enacted the Geothermal Law to guide the exploitation of geothermal for electricity generation.

[159] Adrian J Bradbrook, 'Energy and Sustainable Development' (1999) 4 *Asia Pacific Journal of Environmental Law* 309, 311.

Furthermore, law can provide a financing and investment framework for SD. SE thrives on a solid investment platform for energy transmission and conversion through the provision of embedded infrastructure, electricity-generation plants and transmission networks.[160] RE technologies may be financed using a number of options such as blended finance, public–private partnership and special-purpose vehicles. In addition to these options, law may regulate the utilisation of funds for SE development.[161] In the area of investments, law can play an important role in the energy transition process by promoting investment in RE technologies, which are considered to be capital intensive.[162] Overall, law offers protection and guarantee to RE investors, thereby reducing the risks associated with the investments.[163]

Finally, law aids the use of fiscal incentives in promoting renewable electricity.[164] The cost of sourcing electricity using RE technologies may be more expensive than electricity generated from conventional fossil-fuel sources, and where this is so, the use of incentive mechanisms is arguably crucial to promoting renewable electricity.[165] The experience of countries that have

[160] Priscilla Schwartz, Sustainable Energy Infrastructure: Law, Policy and Practice', (2009) 4(2) *Journal of International Commercial Law and Technology* 107, 108; Oliver Johnson, Cassilde Muhoza, Philip Osano, Jacqueline Senyagwa and Sivan Kartha, 'Catalysing investment in sustainable energy infrastructure in Africa: Overcoming financial and non-financial constraints', Stockholm Environment Institute Working Paper 2017-03 (Stockholm Environment Institute: January 2017) 1.

[161] Priscilla Schwartz, 'Energy Resources Financing and Sustainable Development' (2016) 13(3) *Manchester Journal of International Economic Law* 408, 413–14.

[162] European Commission, Investment Challenges in Energy, 'Transport & Digital Markets: A Forward Looking Perspective' (European Economy Institutional Papers, Institutional Paper 041, November 2016) 3 <https://ec.europa.eu/info/sites/info/files/file_import/ip041_en_2.pdf>.

[163] African Forum for Utility Regulators (AFUR), *Guidelines for Renewable Energy and Regulation* (2013) 17; Govinda R Timilsina and Kalim U Shah, 'Filling the Gaps: Policy Supports and Interventions for Scaling Up Renewable Energy Development in Small Island Developing States' (2016) 98 *Energy Policy* 653, 659–60; European Commission (n 166) 2.

[164] Omorogbe, 'Promoting Sustainable Development' (n 26) 45.

[165] National Research Council, 'Electricity from Renewable Resources: Status, Prospects, and Impediments' The National Academies Press Washington, DC: 2010); David Timmons, Jonathan M Harris and Brian Roach, 'The Economics of Renewable Energy' Global Development And Environment Institute (Tufts University: 2018) 17 http://large.stanford.edu/courses/2018/ph240/liang1/docs/gdae-2014.pdf. See also, Jan C Bongaerts and George Dogbe, 'Optimal Institutional Arrangements and Instruments for the Promotion of Energy from Renewable Sources' in Michael Faure, Joyeeta Gupta and Andries Nenjes (eds), *Climate Change and the Kyoto Protocol: The Role of Institutions and Instruments to control Global Change* (Edward Elgar, 2003) 201, cited in Oniemola, 'Powering Nigeria' (n 35) 82. With development and improvements in renewable energy technologies, the cost advantage of fossil fuel over renewable energy sources is fast decreasing. Some renewable energy technologies, such as solar PV, now compete favourably with fossil fuel on financial terms: see, David Timmons, Jonathan M Harris and Brian Roach, 'The Economics of Renewable Energy' Global Development And Environment Institute (Tufts University: 2018) 17 <http://large.stanford.edu/courses/2018/ph240/liang1/docs/gdae-2014.pdf>;

enacted RE legislation underscores the importance of legislation in the application of fiscal incentives. In cases where these incentives are contained in policy statements, as is the case in many African countries including Nigeria, legislation is still required to make the incentives binding and enforceable.[166]

Legislation is required to bring about a synergy between the provision of energy services and SD. Legislation ensures that changes in the electricity sector, among other things, address modalities for including RE-sourced electricity. The legislation required in this area can be either comprehensive legislation in the form of a law for renewable electricity or partial legislation, wherein a part is dedicated to RE.[167] Whatever option a country takes will go a long way in institutionalising a carefully planned system of energy production and consequently address the challenges of energy security. *Black's Law Dictionary* defines legislation as 'the law so enacted' or 'the whole body of law'.[168] In this thesis, law and legislation will be used interchangeably, and a reference to law or legislation will mean an affirmative enactment for promoting the use of RE sources for electricity generation.

2.3.2 Common Legislative Mechanisms for Increasing Renewable Electricity Generation

Electricity reform inevitably has a bearing on achieving RE policy.[169] Electricity reform, the most widely used energy reform, is now being given special attention in the reform processes of many countries.[170] Although electricity reform has generally been used to achieve efficiencies in the electricity industry,[171] in some countries (such as Egypt), electricity reform is

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Dominic Dudley, 'Renewable Energy Will Be Consistently Cheaper Than Fossil Fuels By 2020, Report Claims', Forbes 13 January 2018 <https://www.forbes.com/sites/dominicdudley/2018/01/13/renewable-energy-cost-effective-fossil-fuels-2020/#2db6ea874ff2>.

[166] Omorogbe, 'The Role of Law' (n 1) 215, 219.

[167] Bradbrook, 'Sustainable Energy Law' (n 161) 514.

[168] B A Garner, *Black's Law Dictionary* (Thomson Reuters, 9th ed, 2009) 982.

[169] Le Dong and Akihisa Mori, 'Multi-level Analysis of Sustainable Energy Transition in Kenya: Role of Exogenous Actors' (2017) 7(5) *International Journal of Energy Economics and Policy* 111.

[170] S M Abdallah, H Bressers and J S Clancy, 'Energy Reforms in the Developing World: Sustainable Development Compromised' (2015) 5 *International Journal of Sustainable Energy Planning and Management* 41, 41.

[171] Anupama Sen, Rabindra Nepal and Tooraj Jamasb, 'Reforming Electricity Reforms? Empirical Evidence from Asian Economies', *Oxford Institute of Energy Studies* (Oxford 2016) 1, 2

also undertaken as part of comprehensive policies for SD as well as to remove barriers to the uptake of renewable electricity.[172] Specific strategies such as privatisation of the power sector, liberalisation of energy markets, energy sector restructuring, accelerated technological changes and mobilisation of investments have been explored as strategies for ensuring access to affordable energy.[173] Electricity sector reforms address issues such as subsidy reviews, establishment of policy environment, review of the regulatory framework, establishment of a market-based approach and changes to the electricity distribution network among others.[174] Moreover, scholars such as Modi et al advocate the introduction of measures that will guarantee supply of reliable electricity to all households, businesses, public institutions and industry, as part of electricity reform.[175]

As well as general electricity market reform, the law may be amended to introduce support mechanisms in aid of RE, not only to increase access to energy, but also to increase awareness of the contribution of RE to energy security.[176] Since the 1970s oil crises, government policies in countries that belong to the Organisation for Economic Co-operation and Development have favoured the promotion of RE through a range of mechanisms.[177] First, a number of countries have introduced RE targets, supported by legislation making it mandatory for either government utilities or private generation companies to generate or purchase a certain amount

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<https://www.oxfordenergy.org/wpcms/wp-content/uploads/2016/02/Reforming-Electricity-Reforms-Empirical-Evidence-from-Asian-Economies-EL-18.pdf>; Alan David Lee and Zainab Usman, *Taking Stock of the Political Economy of Power Sector Reforms in Developing Countries: A Literature Review*, Policy Research Working Paper (World Bank Group, 2018) 1.

[172] Nihal El-Megharbel, *Sustainable Development Strategy: Egypt's Vision 2030 and Planning Reform: Integrated Approaches to Sustainable Development Planning and Implementation* (New York: 2015); Anshul Rana and Ashish Khanna, 'Learning from Power Sector Reform: The Case of the Arab Republic of Egypt', World Bank Group, Policy Research Working Paper No. 9162, February 2020, 9 <http://documents1.worldbank.org/curated/en/344841582641079201/pdf/Learning-from-Power-Sector-Reform-The-Case-of-the-Arab-Republic-of-Egypt.pdf>.

[173] Michael Jefferson, 'Energy Policy for Sustainable Development' in UNDP (n 61) 415, 417.

[174] Aqeel A Bazmi and Gholamreza Zahedi, 'Sustainable Energy Systems: Role of Optimization Modeling Techniques in Power Generation and Supply – A Review' (2011) 15 *Renewable and Sustainable Energy Reviews* 3480, 3480; Rita Shaw, Mike Attree and Tim Jackson, 'Developing electricity distribution networks and their regulation to support sustainable energy' (2010) 38 *Energy Policy* 5927.

[175] Modi et al (n 112) 3.

[176] Johansson (n 2) 48; United Nations, *Agenda 21* (n 107) paras 9.12, 9.35.

[177] Adrian J Bradbrook and Alexandra S Wawryk, 'Government Initiatives Promoting Renewable Energy for Electricity Generation in Australia' (2002) 25(1) *University of New South Wales Law Journal* 124, 124.

of electricity from RE sources.[178] In the USA, for example, this type of requirement is known as 'renewable energy portfolios'.

A second tool that has been widely used across the globe is a feed-in tariff (FiT), which essentially seeks to overcome cost barriers by securing generators of RE a minimum price for renewable electricity.[179] More recently, governments have combined FiTs with reverse RE auctions, whereby developers bid to construct a certain capacity of RE at least cost, with the winner awarded the project and also a FiT for the supply of renewable electricity.[180]

Rural electrification programs have become of increasing importance in developing countries.[181] While the focus of some rural electrification programs has been on distributed systems (e.g. solar rooftop systems), more recent research suggests that developing micro-grids for remote areas, linked to a larger RE system (e.g. wind and solar) may be more efficient, particularly when combined with battery storage to enhance stability and reliability.[182]

To strengthen SE development in Nigeria, certain legal and regulatory mechanisms have evolved over the years. In the area of electricity pricing, Nigeria adopts a liberalised approach through reforms in the electricity sector. The aim is to promote access to affordable electricity

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[178] Ibid.

[179] Victoria State Government, *Victorian Renewable Energy Auction Scheme* <https://www.energy.vic.gov.au/__data/assets/pdf_file/0014/80510/VRET-fact-sheet-Auction.pdf>; Roger Peters and Tim Weis, *Feeding the Grid Renewably: Using feed-in tariffs to capitalize on renewable energy*, (Pembina Institute, 2008) 1, 1-2; African Renewable Energy Alliance (AREA), Powering African through Feed-in Tariffs, (Addis Ababa; 2013) <https://www.boell.de/sites/default/files/2013-03-powering-africa_through-feed-in-tariffs.pdf>; IRENA, IEA and REN21 (2018), 'Renewable Energy Policies in a Time of Transition' IRENA, OECD/ IEA and REN21 (2018) 1, 23 <http://energyaccess.org/wp-content/uploads/2018/04/IRENA_IEA_REN21_Policies_2018.pdf>; Penelope Crossley, *Renewable Energy Law: An International Assessment* (Cambridge UP, 2019) 176, 177.

[180] L Butler and K Neuhoff, *Comparison of feed in tariff, quota and auction mechanisms to support wind power development*, Cambridge Working Papers in Economics (CWPE) 0503, CMI Working Paper 70 (Cambridge, 2004) <www.electricitypolicy.org.uk/pubs/wp>; Greg Buckman, Jon Sibley and Megan Ward, 'The large-scale feed-in tariff reverse auction scheme in the Australian Capital Territory 2012 to 2016' (2019) 132 *Renewable Energy* 176.

[181] United Nations Commission on Sustainable Development (n 106) 3, 5.

[182] Meredith Fowlie, Yashraj Khaitan, Catherine Wolfram and Derek Wolfson, 'Solar Microgrids and Remote Energy Access: How Weak Incentives Can Undermine Smart Technology- How weak incentives can undermine smart technology', International Growth Centre (IGC) Final Report (UKaid March 2018) 1.

through a liberalised electricity market.[183] Other commonly used mechanisms in Nigeria, as in some other African countries, are target setting, FiTs, electricity subsidies (especially in rural areas), standardised power purchase agreements, and long-term electricity licences.[184] However, as will be seen in the next chapter, Nigeria's current policy and legal initiatives have been insufficient to effectively drive the uptake of RE in the electricity supply.

2.4 Conclusion

SE, no doubt, is the cornerstone of SD. Electricity generation from RE sources will enhance energy security as well as self-sufficiency of energy supply. The possibility of fossil energy depletion serves as a catalyst for the use and development of RE. To ensure a smooth transition from an electricity sector dominated by fossil fuel generation to renewable electricity, it is essential to have a law dedicated to RE, to overcome barriers to RE and to promote and establish SE. Governments must also focus on removing impediments to electricity generation and access. For areas that are not connected to the grid, governments can combine mini-grids or standalone systems with distributed RE.[185]

Through a clear-cut legal and regulatory framework, Nigeria can promote the sustainable use and exploitation of energy resources for the development of the country.[186] In the next chapter, this thesis will examine salient provisions of the EPSR Act and the ECN Act with a view to determining how the provisions of these laws have impacted renewable electricity generation and access in Nigeria.

[183] Eyo Ekpo, 'Key industry agreements and expectations from successful bidders' in PricewaterhouseCoopers (PwC), *Privatisation in the power sector: Navigating the transition* (2012) 6, 7 <https://www.pwc.com/ng/en/assets/pdf/pwc-round-table-post-privatisation.pdf>.

[184] Dong and Mori, 'Multi Level-Analysis of Sustainable Energy' (n 173) 111.

[185] A S Sambo, 'Strategic Developments in Renewable Energy in Nigeria' (2009) 3 *International Association for Energy Economics Forum* 15; Omorogbe, 'Promoting Sustainable Development' (n 26) 59.

[186] United Nations Department of Economic and Social Affairs (n 101); ARE (n 146).

CHAPTER 3

NIGERIA'S ENERGY SECTOR

This chapter undertakes a critical analysis of Nigeria's energy sector and, its legal and regulatory framework concerning electricity generation. Although Nigeria has abundant RE resources that can be exploited for electricity generation, these resources have not been optimally exploited for the SD of the country. Historically, significant changes in Nigeria's power sector have always been undertaken by way of general electricity reform, to try to promote the steady supply of electricity. However, efforts to reform the electricity sector, principally through reform of electricity legislation, have been insufficient to promote generation of electricity from RE sources.

This chapter will provide an overview of Nigeria's energy profile and a history of the electricity industry, to provide the context for the subsequent description and critical analysis of the legal and regulatory regime aimed at promoting the uptake of electricity generation from RE sources. This chapter will argue that the legal framework for renewable electricity, as it is presently constituted, is defective and cannot advance the uptake of RE resources for electricity generation. There is no specific law dedicated to increasing the uptake of RE, and the two main laws, the *EPSR Act* and *ECN Act*, are ineffective in this regard. While there are measures aimed at increasing the generation of renewable electricity, as will be explained in this chapter, these are disparate, based in policy and not law, and have been unable to promote a vibrant RE sector, nor achieve a meaningful supply of renewable electricity either through the grid or through standalone systems in rural areas. Moreover, the regulatory regime is characterised by an excess of regulators, with no clear definition and responsibility for RE.

3.1 Nigeria's Energy Profile

3.1.1 Energy Resources

Nigeria is a sub-Saharan African country sharing borders with the Republic of Niger to the north, the Atlantic Ocean to the south, Cameroon to the east and the Republic of Benin to the west. With land covering 923,773 km^2, Nigeria occupies about 3% of Africa's landmass.[187] With a population of over 193 million, Nigeria has one of the largest economies in Africa.[188] It has a federal system of government with powers allocated to the federal, state and local governments. There are 36 states (with Abuja as the Federal Capital Territory) and 744 local government areas.[189]

Nigeria has abundant energy resources: conventional and non-conventional resources. Regarded as an oil-rich country, Nigeria's proven oil reserves exceed 37 billion barrels, with average daily production in excess of 2.4 million barrels.[190] Natural gas reserves in Nigeria are in excess of 187 trillion cubic feet,[191] amounting to about 36% of the proven gas reserves in all of Africa.[192] Coal is another energy resource that Nigeria has in abundance with actual and inferred reserves in excess of 639 million and 2.75 billion tonnes respectively.[193] As well as fossil-fuel resources, Nigeria has vast RE resources including biomass, wind, solar and hydro (small and large hydro) and tidal that can be exploited for electricity generation.[194] From only about 1% of the land areas in Nigeria, Nigeria could generate at least 36,000 MW of electricity

[187] NACOP, *Sustainable Energy for All Action Agenda* (n 16) 18.

[188] Jide Babalola, 'Nigeria's Population Hits 193.3 Million, Says NBS Report', *The Nation* (Online), 6 December 2017 <http://thenationonlineng.net/nigerias-population-hits-193-3m-says-nbs-report/>; International Monetary Fund, 'Regional Economic Outlook: Sub-Saharan Africa Fiscal Adjustment and Economic Diversification' (World Economic and Financial Survey, 2017) 1; KPMG, *A Guide to the Nigerian Power Sector* (KPMG Nigeria, 2016) 2, 5.

[189] Emma O Chukwuemeka and Alexander Aniche, 'Perennial War Between the Three Tiers of Government in Nigeria: The Revenue Sharing Question Re-examined' (2016) 4(2) *Social Science* 21.

[190] NACOP, *Sustainable Energy for All Action Agenda* (n 16) 21; Tatenga Gwaambuka, 'Nigeria, World's 6th Largest Oil Producer, Now World's Largest Petrol Importer', *The African Exponent*, 3 March 2018 <https://www.africanexponent.com/post/8882-nigeria-is-now-worlds-largest-petrol-importer>

[191] NACOP, *Sustainable Energy for All Action Agenda* (n 16) 21.

[192] United Nations Environment Programme (UNEP), *Atlas of Energy Resources in Africa* (2017) 12 <https://www.icafrica.org/fileadmin/documents/Publications/Africa_Energy_Atlas.pdf>.

[193] ECN, *National Energy Policy* (n 8) 17.

[194] FMP (n 20) 1–2; NPC (n 22) 92.

from solar energy.[195] Nigeria also experiences strong wind in various parts of the country,[196] while the Atlantic Ocean that borders some parts of southern Nigeria provides additional potential for offshore wind energy.[197] Small hydro is available in almost every part of Nigeria, and the country could generate 3,500 MW from this resource.[198] Biomass resources are estimated to be around 144 million tonnes/year.[199]

Although all these energy resources exist in quantities that could transform the country's energy landscape, Nigeria is yet to sustainably utilise its fossil fuel or RE resources for the benefit of its citizens. Apart from the fact that a considerable amount of natural gas is lost daily to flaring, Nigeria loses thousands of crude oil barrels to theft and vandalism daily.[200] Coal, nuclear energy and few other resources are no longer part of the energy mix in Nigeria due to non-development following the discovery of crude oil and natural gas.[201]

Biomass (mainly fuelwood and charcoal) is Nigeria's main energy source. A cursory look at Nigeria's energy composition over the past few years will confirm the dominance of biomass over other sources of energy supply. In 2012 alone, out of the 133.7 Mtoe of the primary energy supply, more than 80% was from biomass alone.[202] Following biomass is imported petroleum products, the bulk of which is consumed by the commercial sector. As at the second quarter of 2018, Nigeria had imported over 186 million litres of petroleum products.[203] Electricity accounts for barely 7% of the total energy supply. Of this, large hydro accounts for

[195] Oyedepo et al, 'Towards a Sustainable Electricity Supply in Nigeria' (n 140) 14.
[196] Ayoade Agbetuyi et al, 'Wind Energy Potential in Nigeria' (2012) 3(1) *International Electrical Engineering Journal* 595; FMP (n 20) 15.
[197] N A Udo, A Oluleye and K A Ishola, 'Investigation of Wind Power Potential Over Some Selected Coastal Cities in Nigeria' (2017) 6(1) *Innovative Energy Research* 1, 2.
[198] NPC (n 22) 60; Oyedepo et al, 'Towards a Sustainable Electricity Supply in Nigeria' (n 140) 16.
[199] ECN, *Energy Implications* (n 132) 17; NACOP, *Sustainable Energy for All Action Agenda* (n 16) 12, 21.
[200] UNEP (n 196) 12, 31; Moses Obenade and Gordon T Amangabara, 'The Socio-Economic Implications of Oil Theft and Artisanal Refining in the Niger Delta Region of Nigeria' (2014) 3(7) *International Journal of Science and Research* 2390, 2390.
[201] ECN, *National Energy Policy* (n 8) 17–18.
[202] NPC (n 22) 22.
[203] NACOP, *Sustainable Energy for All Action Agenda* (n 16) 22; National Bureau of Statistics, *Petroleum Products Importation and Consumption (Truck Out): LPG (Q2 2018) Petroleum* (2018) 2, 40 <http://www.nigerianstat.gov.ng/>.

about 14% of electricity generation, and contributes less than 1% to the energy mix.[204] The low contribution of electricity to the energy mix in Nigeria is a result of the challenges facing electricity generation and distribution.[205]

Overall, energy supply in Nigeria is characterised by an overdependence on biomass and imported petroleum products, and the under-utilisation of energy resources, and in particular RE resources, that could benefit the country.[206]

3.1.2 Early History of the Electricity Sector in Nigeria

Inadequate electricity generation and supply is a perennial problem in Nigeria. For many years, erratic power supply has paralysed the economic and commercial activities in Nigeria, leaving many parts of the country with no electricity.[207] There is a gap between electricity generation and supply, while the country continues to experience an increase in electricity demand. Population growth has been identified as a major contributing factor to the growth in electricity demand.[208] Although the GoN has been making efforts to increase installed capacity and the level of generation,[209] the rate of increase is not commensurate with the rate of increase of electricity demand. Nigeria needs to substantially increase installed capacity and generation to be able to meet electricity demand.

The first electricity generating plant, which was installed in 1896, had a capacity of 60 MW.[210] In 1929, the first utility company in Nigeria, the Nigeria Electricity Supply Company (NESCO) was created to boost electricity generation and supply. NESCO, a British-owned company, was

[204] Oniemola, 'Why Should Oil Rich Nigeria' (n 36) 31.
[205] Ibid 32.
[206] NACOP, *Sustainable Energy for All Action Agenda* (n 16) 22.
[207] Galiana (n 119) 1.
[208] Norbert Edomah, Chris Foulds and Aled Jones, 'Energy Transitions in Nigeria: The Evolution of Energy Infrastructure Provision (1800–2015)' (2016) 9 *Energies* 1, 14; Rapu et al (n 123) 12; World Energy Council, *World Energy Resources: 2013 Survey* (2013) 6 <https://www.worldenergy.org/wp-content/uploads/2013/09/Complete_WER_2013_Survey.pdf>.
[209] 'Installed capacity' means the volume of electricity that Nigeria is capable of producing from all its existing power plants. 'Generation', on the other hand, refers to the actual volume that Nigeria is producing.
[210] Oni (n 9) 18; S A Aladejare, 'Energy, Growth and Economic Development: A Case Study of the Nigerian Electricity Sector' (2014) 2(2) *American Journal of Business, Economics and Management* 41, 42.

the first independent power producer (IPP) in Nigeria.[211] NESCO took over control of a 2 MW hydro-electricity plant in Jos in 1930 from Nigerian Power and Tin Fields, which had commissioned this plant in 1923.[212] The NESCO power-generating plants were later increased to six, comprising five hydro-electric plants and one diesel plant which were deployed to serve the tin industry and the Jos environs.[213]

In 1946, the Public Works Department (PWD) was established. The PWD was responsible for the operation and management of the electricity plants in the country, though this function was later transferred to the Nigerian Government Electricity Undertaking following its creation as an arm of the PWD.[214] Both the PWD and NESCO had an electricity production and distribution licence, and shared this right with the Native Authority. The PWD was responsible for electricity generation in Lagos State, while NESCO and the Native Authority generated electricity for other parts of the country.[215]

In 1950, the International Monetary Fund released a report which put Nigeria's population at 37.9 million. Up to this time there had not been any substantial improvement in the country's installed capacity. To improve the electricity situation of the country, in 1950 the GoN harmonised the existing electricity supply structure in the country, establishing a new body, the Electricity Corporation of Nigeria ('the Corporation').[216] About a year after its creation, the Corporation integrated all electricity infrastructures in Nigeria into what is now the national

[211] Federal Ministry of Power and Steel (FMPS), *Renewable Electricity Action Program* (Federal Republic of Nigeria, 2006) 9.

[212] Ibid.

[213] Ibid 6. Following the creation of the National Electric Power Authority (NEPA) in 1978, the Government of Nigeria permitted NESCO to operate independently of the NEPA. Based on the NESCO's track record in rural electricity, in 2000 the Government of Nigeria granted the company a 25-year licence to generate, transmit and distribute electricity to the rural communities in Plateau State. See E S Simpson, 'Electricity Production in Nigeria' (1969) 45(3) Economic Geography 239; Isaac Anyaogu, 'Powered by NESCO, Plateau Communities that have enjoyed 24/7 electricity for 90 years', *BusinessDay* (21 December, 2018); Henrietta Ighomrore, 'Electricity: My NESCO Story' Linked in (16 October 2017) <https://www.linkedin.com/pulse/electricity-my-nesco-story-henrietta-ighomrore>; Onoja Audu, 'Northern Govs Mourn Kretser, MD NESCO', *Independent* (Online) 26 March 2020 <https://www.independent.ng/northern-govs-mourn-kretser-md-nesco/>.

[214] Olalere Peter Olaoye, 'Privatization of Electricity Industry in Nigeria: Lessons from Europe and United States of America' (2014) 5(2) *Renewable Energy Law & Policy Review* 136, 137.

[215] Aladejare (n 201) 42; Okoro et al (n 116) 52.

[216] Claudius A Awosope, 'Nigeria Electricity Industry: Issues, Challenges and Solutions' (Public Lecture Series, 38th Public Lecture, Covenant University, Ota, 2014) 6.

grid. However, the Corporation did not attempt to extend the grid to other parts of the country that were without electricity at the time. There was a disparity in electricity supply between urban and rural areas, and to the present day the inequality in the architectural platform of the national grid continues to exist between urban and rural areas.[217]

By 1961 (a year after independence and 65 years after the installation of the first electricity plant), the installed capacity for electricity had increased to 185 MW, and this was predominantly hydro.[218] In effect, Nigeria added only 125 MW over a period of 65 years notwithstanding the growth in the population over the same period.[219] Nigeria at this time had begun to experience a severe gap between demand for and supply of electricity. The government continued to intensify its efforts to improve the electricity supply, eventually creating the Niger Dams Authority (NDA) in 1962.[220] The NDA was responsible for hydro-electricity generation, which it later sold to the Corporation for distribution. The NDA was also responsible for the construction and maintenance of dams on the River Niger.[221] Through the NDA, the first electricity dam in Nigeria, the Kainji Dam, was constructed in the same year the NDA was created.[222] In June 1972, the GoN, relying on Decree 24 of 1972, merged the Corporation and the NDA into a single body known as the National Electric Power Authority (NEPA).[223] The merger of the Corporation and the NDA was meant to ensure that only one body was responsible for generation, transmission and distribution of electricity in Nigeria.[224]

Between 1968 and 1991, electricity generation increased by only a factor of 6 with actual installed capacity as at 1991 standing at 5,881.6 MW.[225] Nigeria's population, based on the 1991 census, was 87.5 million, although the World Bank put the country's population at over

[217] Ibid.
[218] O S Enibe and A O Odukwe, 'Patterns of Energy Consumptions in Nigeria' (1990) 30(2) *Energy Conversion and Management* 69, 71.
[219] Ibid.
[220] Zarma, Hydro Power Resources in Nigeria, (n 15).
[221] Ibid.
[222] Aigbovo and Ogboka (n 24) 22; Okoro et al (n 116) 52.
[223] Amadi, Improving Electricity Access through Policy Reform (n 38) 345.
[224] Oni (n 9) 29; Awosope (n 220) 7; Amadi, 'Improving Electricity Access' (n 38), 346, 370.
[225] ECN, *National Energy Policy* (n 8) 35.

120 million.[226] The 5,881 MW was not enough to meet the electricity demands of the population at the time. Between 1990 and 1999 Nigeria did not build any new power plants, so generation continued to be insufficient to meet demand. There was substantial under-funding for capital electricity projects and maintenance operations during this period.[227]

The creation of NEPA in 1972 and the monopoly it was granted did not deliver the anticipated change in the electricity sector. Among other issues, NEPA was unable to close the gap between the demand and supply for electricity, nor was it able to correct the inequality in electricity access between urban and rural areas that existed prior to its creation. There are many reasons for these failures, a prominent one of which was seen to be the lack of competition in the electricity market. As a result, the GoN decided to privatise and liberalise the electricity industry, to make it more competitive, and allow and encourage private sector investment.

The proposed electricity reform commenced in 2001.[228] NEPA was scrapped and the Power Holding Company of Nigeria (PHCN) was created as its successor.[229] The reform and current structure of the key players in the electricity industry since privatisation will be further examined in Section 3.3 below, in the context of a critical analysis of the legal and regulatory regime relating to electricity and renewables. Before looking at the law in detail, I will provide further context for the legal analysis by explaining the characteristics of electricity generation and supply in Nigeria, and in Section 3.2 below, developments in government policy in relation to renewables.

3.1.3 Characteristics of Electricity Supply in Nigeria

By 2015, more than half a decade after the commencement of the reform processes, installed generation capacity increased to 12,522 MW, comprised of 10,592 MW from gas-fired stations

[226] W Fricke and G Malchau, 'The Population Census in Nigeria 1991: Geographical Aspects of a Political Poker Game' (1994) 38(3) *Zeitschrift fur Wirtschaftsgeographie* 163.
[227] FMPS, *Renewable Electricity Action Program* (n 215) 6.
[228] Amadi, 'Improving Electricity Access' (n 38) 362.
[229] The reform processes will be discussed in detail in Section 3.3.2.

and 1,930 MW from hydro.[230] The average peak generation at this period was 4,810 MW.[231] By this time, Nigeria's population had increased to 182.2 million.[232] Installed capacity and generation capacity have decreased in recent years. Although the total installed capacity in Nigeria now is around 10,339MW, there are 27 grid-connected power-generating plants with a combined capacity of 7,102 MW and average peak generation of 4,602.4 MW for a population of more than 193.3 million.[233] There is a projection Nigeria's population may reach 267 million by 2030, making it the world's third most populous country.[234] Looking at these projections, the current installed capacity and generation cannot meet the immediate and future electricity requirements of the country. Even if Nigeria generates electricity at the current maximum installed capacity, the available electricity will still be grossly inadequate.[235]

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[230] Advisory Power Team (n 124) 14.

[231] Ifedayo Adeoba, 'Opportunities for Off-Grid Solutions in the Nigerian Power Sector', *Detail Commercial Solicitors* (2016) 1 <https://www.addleshawgoddard.com/globalassets/insights/africa-2016/opportunities-for-off-grid-solutions-in-the-nigerian-power-sector.pdf>.

[232] Population Pyramids, *Population Pyramids of the World from 1950 to 2100: Nigeria* (2019) <https://www.populationpyramid.net/nigeria/1950/>.

[233] F N Okafor, *Improving Electric Power Sector Performance: The Role of Nigeria Electricity Regulatory Commission*, A Public Lecture delivered at the Nigerian Academy of Engineering 2017 Public Lecture on 29 March 2017, 3 <https://www.nae.org.ng/downloads/2017%20Public%20Lecture%20-%20Soft%20copy.pdf>; Oyedepo et al, 'Towards a Sustainable Electricity Supply in Nigeria' (n 140) 3; The shortfall in the generation capacity is as a result of obsolete equipment and/or poor maintenance. See, Advisory Power Team (n 124) 7. There are conflicting figures regarding the actual total electricity installed capacity as well as the number of grid-connected plans. According to the Nigerian Electricity Regulatory Commission (NERC), Nigeria has 23 grid-connected plants with a combine capacity of 10,339 MW. However, other sources indicate 12,522 MW. See, Nigerian Electricity Regulatory Commission, Generation https://nerc.gov.ng/index.php/home/nesi/403-generation; Ken Etim, Akindeji Oyebode and Habibat Adeniran, 'The Nigerian Electricity Supply Industry – Recent Developments and Prospects', *Banwo & Ighodalo* (25 February 2018) <https://www.banwo-ighodalo.com/grey-matter/the-nigerian-electricity-supply-industry-recent-developments-and-prospects?utm_source=Mondaq&utm_medium=syndication&utm_campaign=LinkedIn-integration>; Damilare Famuyiwa, 'The number of idle power plants in Nigeria rises to 10', *Nairametrics* (Business News) 11 September 2019 <https://nairametrics.com/2019/09/11/the-number-of-idle-power-plants-in-nigeria-rises-to-10/>.

[234] NACOP, *Sustainable Energy for All Action Agenda* (n 16) 9, 19; Department of Economic and Social Affairs, Population Division, *World Population Prospects: The 2017 Revision, Key Findings and Advance Tables* (United Nations, 2017) 5 <https://esa.un.org/unpd/wpp/publications/Files/WPP2017_KeyFindings.pdf>; NBC News, 'Nigeria to Pass U.S. as World's 3rd Most Populous Country by 2050, UN Says', *NBC News* (Online), 22 June 2017 <https://www.nbcnews.com/news/world/nigeria-pass-u-s-world-s-3rd-most-populous-country-n775371>.

[235] Energy Commission of Nigeria, 'Commission Puts 2015 Power Need at 31,240MW' (2015) <http://www.energy.gov.ng/index.php?option=com_content&view=article&id=121>; Titus O Ajewole, Robert P M Craven, Olakunle Kayode and Olufisayo S Babalola, 'Simulation of Load-Sharing in Standalone Distributed Generation System' (2018) 154 *IOP Conference Series: Earth and Environmental Science* 1, 1.

Nigeria currently generates electricity from oil, gas and hydro.[236] Currently, not less than 80% of grid electricity in Nigeria comes from thermal plants using only gas.[237] Gas, the principal source of grid electricity, is a major challenge for electricity generation in Nigeria.[238] The gas supply is subject to frequent disruptions, which in turn results in frequent collapses in the electricity supply.[239] The spate of insecurity in some parts of the country is also affecting the ability of the gas-fired plants to deliver at a maximum capacity.[240] Moreover, since 2016, the frequent vandalism of gas pipelines 'has underscored concerns about Nigeria's energy security and served as a constant reminder of the need to diversify the country's energy mix'.[241] On many occasions, the unreliability of the gas supply has forced Nigeria to rely on hydro-electricity alone, the maximum capacity of which cannot satisfy the country's electricity requirements. Electricity generation from gas is not sustainable in the long term since its supply cannot be guaranteed at all times, and Nigeria's overdependence on gas has been recognised as the bane of energy security in Nigeria.[242] In other words, gas-based electricity is a source of threat to the environment, it is not environmentally sustainable in the long term.

Inefficient transmission and distribution has been, and remains, an ongoing challenge of electricity supply in Nigeria. Nigeria has an electricity transmission capacity estimated at 5,523.8 km and 6,801.49 km of 330 KV and 132 KV lines respectively. These electricity assets are old, with high costs of maintenance, and do not cover all parts of Nigeria.[243] Electricity supply to rural areas travels over long distances through this outdated infrastructure, and the bulk of it is lost. The outdated electricity infrastructure undermines the reliability of grid

[236] Advisory Power Team (n 124) 11.
[237] Dolapo Kukoyi and Adeyemi Esan, 'Nigeria' in Karen B Wong (ed), *The Renewable Energy Law Review* (Law Business Research, 2018) 108, 108.
[238] Advisory Power Team (n 124) 17-18.
[239] Zubairu G Usman, Serkan Abbasoglu, Neyre T Ersoy and Murat Fahrioglu, 'Transforming the Nigeria Power Sector for Sustainable Development' (2015) 87 *Energy Policy* 429, 429; Roseline Okere, 'Why Nigeria is not able to generate 6,000MW, by NERC', *The Guardian* (Online), 31 July 2015 <https://guardian.ng/business-services/why-nigeria-is-not-able-to-generate-6000mw-by-nerc/>.
[240] Nigerian Bulk Electricity Trading (NBET), 'Utility Scale Solar Development in Nigeria in Comparison to Other African Countries' (NBET Discussion Paper Series, 2016) 5.
[241] Dalberg Global Development Advisors, *Improving Access to Electricity Through Decentralised Renewable Energy, Policy Analysis from India, Nigeria, Senegal and Uganda* (2017) 54.
[242] Amadi, 'The Expectations of Nigerian Consumers' (n 125) 37.
[243] KPMG (n 192) 10.

electricity in providing access to every part of the country, and there are serious doubts about the extent to which the grid would be physically capable of coping with a sustained increase in electricity generation without an upgrade and/or improved technology.[244]

Resolving the inequality in electricity access between urban and rural areas is a fundamental concern of the Nigerian Government.[245] As stated earlier in this thesis, Nigeria is one of the countries with the poorest records in ensuring access to electricity.[246] Electricity supply to urban areas is mainly through the national grid, while rural areas that are not connected to the grid have had to rely on off-grid electricity (standalone systems, mini-grids and independent power plants), although RE supplied through these means to rural areas is still only marginal.[247] A majority of the rural population rely on fuelwood to satisfy their basic electricity requirements, while those in urban areas make use of generators, solar inverters and other alternatives.[248] Many businesses have closed down as a result of substantial losses incurred by generating power from alternative sources.[249]

Increasing electricity generation capacity using gas and/or large hydro and seeking to extend the grid is not likely to solve the challenges of providing sustainable electricity to every part of the country.[250] The electricity architecture of Nigeria cannot support grid expansion to remote areas of the country, and the GoN has stated that the option of grid expansion to all communities in Nigeria is practically impossible, as it would cost many trillions of naira.[251] Electricity generation from RE sources will afford Nigeria the opportunity provide off-grid electricity to remote areas which are not connected to the grid.[252] Even if grid expansion aids

[244] A C Ohajianya, O E Abumere, I O Owate and E Osarolube, 'Erratic Power Supply in Nigeria: Causes and Solutions' (2014) 3(7) *International Journal of Engineering Science Invention* 51, 53.
[245] Bhattacharyya (n 74) 227.
[246] Banerjee et al (n 138) 7.
[247] Bashir and Modu (n 139) 1217; Akeredolu (n 139).
[248] Emodi and Boo (n 133) 581.
[249] FMP (n 20) 6; Emodi and Boo (n 133) 581; Chete et al (n 142) 10.
[250] FMPS, *Renewable Electricity Policy Guidelines* (n 19) 5.
[251] AllAfrica, 'Nigeria Will Never Have Electricity Sufficiency Using Main Grid – Nebo', *ThisDay Interview*, 16 July 2018 <https://allafrica.com/stories/201807160058.html>.
[252] Sustainable Energy for All Africa Hub, *Mini Grid Market Opportunity Assessment: Nigeria*, Green Mini-Grid Market Development Programme (African Development Bank June 2018) 1, 18; Laura Mellado, *Bringing*

the goals of distribution and access, Nigeria will still not be able to generate sufficient megawatts of electricity using fossil fuel energy sources alone.

This reality of the challenges of electricity generation and supply, spanning decades, has led successive Nigerian governments to adopt policies that recognise the importance of RE and target a substantial expansion in the country's installed electricity generating capacity from RE sources.

3.2 Renewable Energy Policy in Nigeria

In view of the RE resource potential, and the importance of RE for achieving SE and SD, Nigeria has developed many successive policies relevant to energy and RE, since the first policy – the Draft National Policy on the Environment – was created in 1998.[253] The goal of the Nigeria's energy policy is the promotion of energy security through a robust energy system. The GoN plans to diversify the energy sources based on the principle of "an energy economy in which modern renewable energy increases its share of energy consumed and provide affordable access to energy through-out Nigeria, thus contributing to sustainable development and environmental conservations".[254] Currently, there are about 39 policy documents in the energy sector, the majority of which are still in draft form with no definite date for receiving government approval.[255] Since 2003, when the NEP was adopted, the GoN has created (among others) the 2005 Renewable Energy Master Plan (REMP); the 2006 Renewable Electricity Policy Guidelines (REPG) and the Renewable Electricity Action Program (REAP); the National Renewable Energy and Energy Efficiency Policy (NREEEP); the Vision 20:20

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reliable electricity to rural communities in Nigeria (European Commission 3 July, 2019) <https://ec.europa.eu/commission/news/bringing-reliable-electricity-rural-communities-nigeria-2019-jul-03_en>.

[253] Federal Environmental Protection Agency (FEPA), *Draft Revised National Policy on the Environment* (Presidency, 1998). The document, though an environmental policy document, was the first document to create awareness about the potential of RE resources in Nigeria. It envisaged that energy consumption in Nigeria would increase as the level of industrialisation increased and, therefore, urged the government to, as a matter of urgency, consider alternative energy resources to address the anticipated increase in energy consumption. The policy was never finalised and adopted.

[254] Emodi, Energy Policies for Sustainable Development Strategies (n 118) 52.

[255] Federal Republic of Nigeria, *The Nigerian Power Sector Investment Opportunities and Guidelines (Draft)* (Federal Government of Nigeria, 2016) 9.

Program (2009); and the Sustainable Energy for All Agenda. It is beyond the scope of the thesis to examine all the relevant policy documents, but some features will be highlighted.

3.2.1 National Energy Policy

The NEP is a sector-wide policy designed to bring together in one document the individual sub-sector policies existing at the time, that is, oil and gas, electricity and solid minerals.[256] The NEP exists as a blueprint for SD and utilisation of energy resources in Nigeria in a manner that will facilitate international trade and cooperation.[257] Among other objectives, the NEP seeks to promote SE at appropriate costs; aid the use of the nation's energy resources for international cooperation; and increase the contribution of energy-productive activities to national development. It highlights strategies for exploring RE resources, among which the key strategies are information gathering on emerging technologies, encouraging research and development on RE technologies; and prioritising the viability of these resources.[258]

In the area of electricity generation, the NEP seeks to expand the sources of electricity generation in Nigeria that were hitherto dominated by gas and hydro by providing eight fuel mix for electricity generation in Nigeria: nuclear, coal, natural gas, hydro, small hydro, biomass, solar and wind.[259] It further identifies environmental challenges that may have impacts on energy production in Nigeria.[260] With respect to rural electrification, the NEP sets targets for access rates, emphasises the role of RE in achieving these targets and recommends the use of off-grid and standalone systems.[261]

[256] ECN, *National Energy Policy* (n 8) 2; Ibibia L Worika, 'Rural Applications' in Richard Ottinger et al, *UNEP Handbook for Drafting Laws on Energy Efficiency and Renewable Energy* (United Nations Environmental Programme (UN Environment), 2016) 260, 269.
[257] ECN, *National Energy Policy* (n 8) 1.
[258] ECN, *Energy Implications* (n 132) 19.
[259] Ibid 61.
[260] *ECN, National Energy Policy*, (n 8) 45.
[261] Ibid 36, 64.

3.2.2 Renewable Energy Master Plan

Drafted in 2005, the REMP was a specific policy for the development of RE resources. The making of the REMP coincided with the passage into law of the *EPSR Act* (see below), to privatise and liberalise the electricity sector. The REMP highlighted Nigeria's vision on the role of RE in SD, and explained the challenges of electricity generation and access in the country, and the need to explore RE in addressing electricity challenges.[262] The REMP set out strategies for power generation using solar, wind, biomass and hydro, and the strategies for actualising the power generation objective.[263] It addressed issues that are peculiar to the development of RE, such as the legal and institutional framework, fiscal and financial incentives, capacity building (human and infrastructural), RE portfolios and feed-in-tariffs.[264] It further targeted the integration of RE into building policy, electricity grid and other distribution systems.[265]

3.2.3 Renewable Electricity Policy Guidelines and Renewable Electricity Action Program

In December 2006, the GoN approved the REPG[266] and the REAP.[267] The REPG set out Nigeria's vision for renewable electricity through policy guidelines for the exploitation of RE for electricity generation,[268] to achieve 'accelerated sustainable development' through an increased share of electricity from RE source in the national electricity supply.[269] The REPG recognised the necessity of pursuing electricity diversification using RE resources to meet energy demand and rural electrification targets in Nigeria,[270] acknowledging the inability of the GoN to increase electricity generation in the country either by using conventional energy

[262] ECN, *Renewable Energy Master Plan* (n 18) 3.
[263] Ibid 26–32.
[264] Ibid 6.
[265] Ibid 36.
[266] FMPS, *Renewable Electricity Policy Guidelines* (n 19).
[267] FMPS, *Renewable Electricity Action Program* (n 215).
[268] FMPS, *Renewable Electricity Policy Guidelines* (n 19) 3; Deutsche Gesellschaft für International Zusammenarbeit (GIZ) GmbH, *Nigerian Energy Support Programme* (2015) 69.
[269] Ibid 4.
[270] Ibid 5.

sources or grid expansion, without exploring RE sources.[271] It further provided for the use of support mechanisms (e.g. FiTs, grid access and power purchase agreements) to encourage the production of electricity from renewables.[272] In the area of funding, the REPG established the Renewable Electricity Trust Fund (RETF) to support renewable electricity and the use of small-scale renewables in improving rural electrification.[273]

The REAP on the other hand, sought to establish a framework for the attainment of the objectives of the REPG in terms of national development.[274] The REAP set targets and strategies for achieving renewable electricity targets with a specified timeframe.[275] To aid the development of renewable electricity, the REAP introduces market-distorting subsidies whereby the GoN will remove subsidies for electricity from conventional electricity sources to create a level playing field for renewable electricity producers. The market-distorting form of subsidy is in line with the provisions of the EPSR Act on subsidies. The rationale behind this was to discourage production and consumption of electricity from fossil sources in favour of RE sources by removing subsidies for conventional sources and introducing a tariff regime that encourages investments in renewable electricity.[276]

3.2.4 Vision 20:20 Program

The Vision 20:20 Program was an economic blueprint designed to make Nigeria one of the 20 leading industrialised economies in the world by 2020.[277] The program highlights the role the energy sector will play in the actualisation of the country's vision thus: 'By 2020, the energy sector will be the major engine of the nation's sustainable social, economic and industrial growth, delivering affordable and constant energy supply efficiently to other sectors of the

[271] FMPS, *Renewable Electricity Policy Guidelines* (n 19) 3, 13, 16.
[272] Ibid 15.
[273] Ibid 17; Worika, 'Rural Applications' (n 260) 269.
[274] FMPS, *Renewable Electricity Action Program* (n 215) 10.
[275] Ibid 10, 52.
[276] Ibid 61; FMPS, *Renewable Electricity Policy Guidelines* (n 19) 15.
[277] NPC (n 22).

economy'.[278] In the Vision 20:20 Program, Nigeria sets a target of between 25,000 MW and 40,000 MW of installed electricity capacity by 2020, and at least 35,000 MW production in order to actualise the country's dream of becoming one of the 20 leading economies in the world.[279] Out of the 35,000 MW production target set, not less than 1,000 MW is expected to come from RE sources.[280]

The plan is to develop RE by encouraging the use of solar, biomass, coal, wind and nuclear to reduce Nigeria's reliance on gas-fired plants.[281] The program outlines five strategic areas for the energy sector: (i) energy security; (ii) commercial and market incentives; (iii) economic reforms to establish an effective institutional and regulatory framework; (iv) diversification of the energy mix through utilisation of RE; and (v) development of efficient and SE generation, and consumption patterns.[282] The program contains implementation plans and categorises the timeframe for the attainment of its objectives into the short term (2010–2012), the medium term (2013–2015) and the long term (2016–2020).[283]

3.2.5 National Renewable Energy and Energy Efficiency Policy (NREEEP)

The NREEEP is a high-level policy document which supersedes all the previous policy documents on the deployment of RE in the electricity sector.[284] The major aim of the NREEEP is the 'optimal utilization of the nation's energy resources for sustainable development'.[285] The NREEEP set targets for a significant increase in the contribution of RE sources to the energy mix, from 1.3% in 2015 to 16% by 2030.[286] The 16% RE target will be achieved in the following proportion: hydropower (7.07%), biomass (2.78%), solar (5.90%) and wind

[278] Ibid 91.
[279] Ibid 13, 179.
[280] Ibid 113.
[281] Ibid 13.
[282] Ibid 13, 92.
[283] Ibid 118.
[284] FMP (n 20) viii; Dalberg Global Development Advisors (n 245) 47.
[285] FMP (n 20) 1.
[286] FMP (n 20) 36; NACOP, *Sustainable Energy for All Action Agenda* (n 16) 26.

(0.25%).[287] The NREEEP classifies energy supply into two broad categories: urban and rural energy supply.[288] Electricity will be supplied to urban areas through the grid, while rural areas will benefit from off-grid electricity through the utilisation of different RE resources available in different areas.[289] For the first time, Nigeria identified the impossibility of supplying electricity to all parts of the country through the grid alone. This shows a clear understanding of one of the fundamental challenges of grid electricity in Nigeria.

Other critical provisions of the NREEEP include a mandatory or voluntary renewable portfolio standard, FiTs, bidding, net-metering, power production tax credits and tax incentives for RE projects.[290] It provides economic justifications for the inclusion of RE in the nation's energy mix and also recognises the frameworks set out in the Vision 20:20 report with respect to electricity targets. It further identifies that removing barriers to private sector investment in the electricity sector is critical to reform.[291] The NREEEP emphasises the importance of strengthening the institutional framework and effective coordination of energy programs at all levels of government for the realisation of the country's energy objectives.[292]

Though a crucial step in the development of RE by addressing fundamental challenges relating to energy insecurity in Nigeria, poor implementation and the absence of a dedicated RE law remained major challenges to the implementation of the NREEEP. For instance, whilst it provides for the use of a sovereign guarantee to promote renewable-sourced electricity, NREEEP does not provide any additional details on the implementation of this mechanism.[293] Another challenge of the NREEEP is that it lacks a framework for the implementation of decentralised renewables.[294] Given the costs of grid construction, Nigeria cannot rule out the

[287] National Council on Power (NACOP), *National Renewable Energy Action Plans, 2015–2030* (2016) 6.
[288] Ibid iv, 7, 10.
[289] Ibid viii.
[290] FMP (n 20) 4.
[291] Ibid 5, 7.
[292] Ibid 8.
[293] FMP (n 20) 21; Dalberg Global Development Advisors (n 245) 56.
[294] Dalberg Global Development Advisors (n 245) 56.

option of decentralised renewables in its electricity generation and supply. This limits the effectiveness of the NREEEP in solving the challenges of energy security in Nigeria.

In 2016, the National Council on Power approved the National Renewable Energy Action Plan (NREAP) for the implementation of the NREEEP. The RE target in the NREEEP has been revised in the NREAP to 30% by 2030.[295] The contribution of grid-connected RE to the electricity mix is expected to be 38% and 29% by 2020 and 2030 respectively.[296] With this target, grid-connected renewable electricity will be 5,325 MW by 2020 and 13,800 MW by 2030.[297] According to the NREAP, use of RE resources in electricity generation will guarantee energy security and provide investment opportunities in the sector.[298] A further fundamental issue addressed by the NREAP is funding, and the NREPA establishes two funding platforms, the Green Equity Fund and the Green Fund, for renewables.[299] The reality is that these funds have not been applied for the development of RE.

3.2.6 Sustainable Energy for All Action Agenda (SE4ALL-AA)

The SE4ALL-AA is a response to the SE development initiative that was launched by the United Nations in 2011. It captures Nigeria's specific goal for electricity generation as part of broader global SE development goals. The SE4ALL-AA outlines three cardinal objectives: (a) energy access; (b) energy efficiency; and (c) RE.[300] It provides for the setting of renewable electricity targets, establishment of an RE databank and the use of approved policy instruments (e.g. competitive bidding and FiTs) as means of incentivising electricity generation from RE sources.[301]

[295] NACOP, *Sustainable Energy for All Action Agenda* (n 16) 12, 26, 30; NACOP, *National Renewable Energy Action Plans* (n 291) 9.
[296] NACOP, *National Renewable Energy Action Plans* (n 291) 9.
[297] Ibid 11.
[298] Ibid 5.
[299] Ibid 7.
[300] NACOP, *Sustainable Energy for All Action Agenda* (n 16) 11–12.
[301] Ibid 14.

The SE4ALL-AA embodies Nigeria's vision 30:30:30 for the electricity sector, that is, the generation of 30 GW of electricity with 30% RE component by 2030.[302] Overall, 70% of the target will be on-grid, 18% off-grid while captive generation will contribute 12%. The plan is to increase the contribution of on-grid RE-sourced electricity to 48% and 70% by 2020 and 2030 respectively.[303] It is envisaged that Nigeria will require at least US $3.5 billion per annum to actualise the 10 GW and 30 GW of on-grid electricity by 2020 and 2030 respectively.[304]

The SEA4ALL-AA emphasises off-grid electricity as a solution to electricity access more than any other policy document.[305] It sets strategies for increasing electricity access from the current 40% to at least 75% and 90% by 2020 and 2030 respectively with not less than 10% RE components in the energy mix.[306] The 75% access target for 2020 will be met by connecting 95% of houses in urban areas and 60% of the rural population.[307] Setting these targets shows Nigeria's commitment to addressing electricity challenges and consequently actualising the country's electricity objectives.[308] The SEA4ALL-AA also identifies that the problems with Nigeria's grid infrastructure include the overloaded transmission line, poor voltage profile of the network, and technical and non-technical losses.[309]

Despite the potential of RE to address electricity challenges in Nigeria, and all the policy directions, RE resources are yet to be optimally harnessed in generating electricity in

[302] Energy Commission of Nigeria, *Nigerian Sustainable Energy for All (SE4ALL) Action Agenda: Electricity Vision 30:30:30* <http://www.se4all.ecreee.org/sites/default/files/nigeria_se4all_action_agenda-energy_mix_chart.pdf>.
[303] Ibid 31, 37, 40.
[304] Ibid 22, 49.
[305] Dalberg Global Development Advisors (n 245) 48.
[306] Ibid 29.
[307] Federal Ministry of Power, Works and Housing (FMPWH), *Rural Electrification Strategy and Implementation Plan* (Federal Republic of Nigeria, 2016) 6, 8; Shehu Usman Yamusa II and Abdul Haseeb Ansari, 'Renewable Energy Development as a Solution to Rural Electrification in Nigeria' (2015) 3(1–2) *Journal of Business Law and Ethics* 85, 101.
[308] United Nations Environment Programme Finance Initiative (UNEP FI), *Financing Renewable Energy in Developing Countries: Drivers and Barriers for Private Finance in Sub-Saharan Africa* (2012) 48.
[309] M O Oseni, 'An Analysis of the Power Sector Performance in Nigeria' (2011) 15 *Renewable and Sustainable Energy Reviews* 4765, 4766.

Nigeria.[310] The performance so far, particularly as it relates to the actualisation of the renewable electricity targets, has not been impressive. Nigeria has failed to actualise nearly all the pre-2020 targets, whilst the actualisation of the year 2020 targets and beyond remains doubtful.[311] A key reason for this is that the targets and objectives of the policy have not been driven by effective law reform. Nigeria has drafted numerous policies, and when these have failed, it has passed new policies. Nigeria does not have an affirmative law for the regulation of renewable electricity, and current legislation is unable to drive reform, as this chapter will now demonstrate.

3.3 Legal Framework for Electricity and Renewable Electricity

This part of the thesis examines legislation relevant to measures to increase the uptake of electricity generated from RE sources in Nigeria, with a view to highlighting areas that require further development. The legal framework is comprised of the Constitution and national legislation.

3.3.1 1999 Constitution

The 1999 Constitution (as amended) provides the foundation for electricity regulation, including renewable electricity, in Nigeria.[312] The Constitution divides powers over electricity generation, transmission and distribution between the federal government (GoN) and the 36 state governments (SGs).[313] The GoN exercises power with respect to generation, transmission and distribution of electricity over the national grid, while the powers of the SGs are limited to

[310] Carlos Pestana Barros, Ade Ibiowie and Shunsuke Managi, 'Nigeria's Power Sector: Analysis of Productivity' (2014) 44 *Economic Analysis and Policy* 65, 65.

[311] Eric Kehinde Ogunleye, 'Political Economy of Nigerian Power Sector Reform' in Douglas Arent (ed), *The Political Economy of Clean Energy Transitions* (Oxford University Press, 2017) 391, 392.

[312] Ayodele Oni, 'The Nigerian constitution, states and electricity regulation', BusinessDay 10 April, 2014 <https://businessday.ng/legal-business/article/the-nigerian-constitution-states-and-electricity-regulation/>.

[313] FMPS, *Renewable Electricity Policy Guidelines* (n 19) 9; GIZ, *Nigerian Energy Support Programme* (n 272) 56; Akintunde Akinleye 'Conflicting laws keep Nigeria's electricity supply unreliable' 23 August, 2017 <https://theconversation.com/conflicting-laws-keep-nigerias-electricity-supply-unreliable-81393>.

electricity functions not covered by the grid.[314] The Constitution does not differentiate between fossil-fuel electricity and renewable electricity. So, the powers of the GoN and the SGs respectively apply to both conventional and renewable electricity. With these provisions, the Constitution provides for the centralisation of grid electricity. Since the bulk of generation and transmission of electricity is through the grid, the activities of the SGs are, therefore, limited in this respect.[315] While SGs could have a role to play in off-grid generation, this thesis will focus on the role of the federal government, which has been the primary driver of electricity law and policy in Nigeria.

3.3.2 Legislation

The GoN, acting through its agencies and bodies, regulates the privatised electricity industry, in addition to providing policy direction in the electricity sector.[316] For renewable electricity, there is no institutional framework separate from the general electricity framework. In other words, the framework for the regulation of conventional electricity applies to renewable electricity.

(a) Early Legislation

The earliest legislation for the regulation of electricity in Nigeria was the Electricity Corporation of Nigeria Ordinance No 15 of 1950, which created the Electricity Corporation of

[314] Concurrent Legislative Lists, Second Schedule to the 1999 Constitution, paras 13, 14; Worika, 'Rural Applications' (n 260) 279. Although Item 13 does not contain the phrase "national grid', it can be inferred from the provisions of Item 14 that the electricity generation and transmission referred to in Item 13 relates to the national grid.

[315] Yemi Oke, 'Conflicting Laws Keep Nigeria's Electricity Supply Unreliable', *The Conversation*, 24 August 2017 <https://theconversation.com/conflicting-laws-keep-nigerias-electricity-supply-unreliable-81393>. By the provisions of the 1999 Constitution, where there is an overlap or a conflict between a federal law and a law made by a state (in this case, electricity law), the federal law will prevail. Also, where a law made by the federal government covers a subject matter, the federal law will prevail. See, Constitution of the Federal Republic of Nigeria 1999 (as amended) ss 1(3), 4(5); I O Agbede, Conflict of Laws in a Federation: The Nigerian Experience' (1973) 7 *Nigeria Law Journal* 48; Patrick Mgbeoma, *Critical Analysis: Constitutional Doctrine of Covering the Field and its Applicability in Our Nigerian Courts*, AAA Chambers, 6 August, 2019 <http://www.aaachambers.com/articles/critical-analysis-constitutional-doctrine-of-covering-the-field-and-its-applicability-in-our-nigerian-courts/>; A. G. Lagos State v Eko Hotels Ltd & Anor (2017) LPELR – 43713 (SC).

[316] Worika, 'Rural Applications' (n 260) 268; Shehu Usman Yamusa II and Abdul Haseeb Ansari, 'Renewable Energy Development in Two Selected African Countries: An Overview and Assessment' (2013) 3 *Renewable Energy Law and Policy Review* 153.

Nigeria.[317] Following the Electricity Corporation of Nigeria Ordinance was Decree No 24 of 1972, which merged the Corporation and the NDA, and established the NEPA. At this time, there was no policy direction on the use of RE for electricity generation. So, the Decree and the Ordinance did not contain provisions on the deployment of RE sources for electricity; rather, they both focused on the development of hydro-electricity. It was not until 1979, and following the 1970s oil crisis, that Nigeria enacted the *Energy Commission of Nigeria Act* ('ECN Act') for the regulation and development of RE.

Energy Commission of Nigeria Act

The *ECN Act* established the Energy Commission of Nigeria ('the Commission') to undertake research on the use of alternative energy. At the time of its enactment, the *ECN Act* did not repeal earlier legislation, that is, the Electricity Corporation of Nigeria Ordinance and the Decree. Both the Ordinance and the Decree were eventually recognised as Acts of Parliament, as the *Electricity Act* and the *National Electric Power Authority Act* respectively.[318] The Commission oversees strategic planning and coordination of energy development, and performance monitoring.[319] By law, the functions of the Commission are essentially research and data gathering to promote the use of alternative energy resources in Nigeria.[320] The ECN Act gives the Commission powers to prepare a periodic masterplan, make recommendations to the Minister of Power on the exploitation of new energy resources, and ensure broad-based participation in the energy sector.[321] Thus, although it is not an electricity regulator, the Commission is actively involved in the promotion of renewable-sourced electricity through the development of policy in relation to research, data gathering and strategy development.[322] Some of the policies developed by the Commission are for the entire energy sector (e.g. the

[317] Yola Electricity Distribution Company, *About Us* (2020) <yedc.com.ng>.
[318] Electricity Act 1990; National Electric Power Authority Act 1990.
[319] Energy Commission Act 1979 preamble, s1(1).
[320] Ifeyinwa Ufondu, Ike C Ibeku and Felix Obetta, 'Renewable Energy in Nigeria', *Lexology* (2019) <https://www.lexology.com/library/detail.aspx?g=e3a5d485-f596-4f59-b9bd-ba5dd5ae31f5>.
[321] ECN Act s 5(d), (e); FMPS, *Renewable Electricity Policy Guidelines* (n 19) 22.
[322] Energy Commission of Nigeria Act s 5(d)(i).

NEP), while others specifically target the development of RE resources in Nigeria (e.g. the Renewable Energy Master Plan).

The *ECN Act* has not brought about any significant change to the development of RE in Nigeria. Apart from reference to 'Alternative and New and Renewable Energy Sources' as one of the departments within the Commission, and the provisions of section 5 relating to research on the exploitation of new and alternative energy resources, the *ECN Act* does not provide guidelines on the use of RE for power.[323] The Commission does not, in any real sense, have powers to develop RE. Plans have been underway since 2009 to address these obvious gaps in the *ECN Act* via a Bill before the National Assembly. The Bill, if and when passed, will give the Commission powers to develop RE by giving 'priority to the promotion and development of renewable energy sources'.[324] The proposed amendments include provisions on the use and development of RE technologies for electricity generation and strategies for increasing the percentage of RE sources to a reasonable level in the energy mix.[325] The Bill will also give the Commission powers over registration and issuance of licences to private grid operators for electricity below 1 MW.[326] However, the Bill has been in existence since 2009 and as yet there is no indication when, if ever, it will be enacted into law.

Electric Power Sector Reform Act

While the focus of the ECN is the establishment of a commission to oversee research on alternative energy, the *EPSR Act* was enacted purposely for the reform of the electricity sector. The EPSR Act was passed into law in 2005, repealing both the Electricity Act and the *National Electric Power Authority Act*.[327] The main reason for enacting the *EPSR Act* was to provide legislative support for policy in relation to reform of the electricity sector, as set out in the National Electric Power Policy of 2001. The aim of the *EPSR Act* is, among other things, to

[323] Aigbovo and Ogboka (n 24) 24.
[324] Energy Commission of Nigeria Act (Amendment) Bill 2009 s 5.
[325] Ibid s 5A(d), (e).
[326] Ibid s 5C.
[327] Electric Power Sector Reform Act 2005 s 99.

provide access to private sector funds, reduce electricity generation and transmission losses, and achieve sustainable cost pricing without subsidies.[328] The Act specifically targets four key areas: (a) policy formulation; (b) electricity regulation; (c) restructuring; and (d) reorganisation of the REP.

The EPSR Act transformed the electricity sector by disbanding the monopoly of the state-owned utility company (that is, NEPA), establishing a competitive and liberalised electricity market, a new licensing regime, and segmentation of the electricity industry.[329] It changed the government-owned vertically integrated power structure that existed prior to 2005 to vertically unbundled segments, distinguishing the functions of generation, transmission and distribution, and introducing competition into generation and distribution. To do this, the Act provided for the establishment of an initial holding company; the incorporation of a company to handle the transfer of assets and liabilities of the initial holding company to a successor company;[330] and the establishment of the successor company – the Power Holding Company of Nigeria (PHCN) – to handle matters relating to electricity generation, distribution and transmission during the transition.

The Act sets criteria for the advancement of power generation reform and a broader mandate for the regulation of the power market.[331] The *EPSR Act* established the Nigerian Electricity Regulatory Commission (NERC) as the sole regulatory body for the electricity sector. The NERC oversees all activities relating to electricity in Nigeria. It sets prices and regulates granting of electricity licences for different functions, that is, generation, trading, transmission, distribution and system operation.[332] Following the segmentation of the electricity functions,

[328] Dimitri Papaefstratiou, 'The Nigerian Power Market Experiment: A Critical Appraisal of the PHCN Privatisation', *DLA Piper, Insights* (15 March 2019) <https://www.dlapiper.com/en/uk/insights/publications/2019/03/the-nigerian-electricity-market-experiment/>.

[329] Electric Power Sector Reform Act 2005 ss 25, 26, 62.

[330] Ibid s 22(1). It is as a result of these provisions that the Nigerian Electricity Liability Management Company was incorporated in August 2006.

[331] F Ayanruoh 'Will Liberalizing the Nigerian Electricity Power Sector Solve the Problem of Shortage of Capacity?' (2012) <www.works.bepress.com/felix_ayanruoh/2>.

[332] Electric Power Sector Reform Act 2005 s 76.

NERC sets tariffs for electricity generation, distribution and transmission, and guidelines for the rural electrification programme (REP), discussed further below).[333] The Act also required incorporation of Nigerian Bulk Electricity Trading (NBET) to purchase electricity from the (new) private generating companies (GenCos); and the Rural Electrification Agency (REA) to oversee the REP, which was almost moribund at the time.[334]

As well as these bodies, the Federal Ministry of Power, Works and Housing (FMPWH) is the government ministry responsible for providing general policy directions, programs and coordination of activities of all tiers of government and other government agencies on matters relating to electricity, including the use and production of renewable electricity.[335] It makes recommendations to the GoN on legislation/policies concerning electricity generation, distribution and transmission, and ensures consistency in the nation's electricity policy.[336]

This chapter will now explore the key provisions and measures of the *EPSR Act* – electricity sector reform; the renewable energy feed-in tariff (REFiT), the REP, and (briefly) other mechanisms such as tax relief – before concluding with a critical analysis demonstrating that, despite these measures, the Act has failed to deliver substantial uptake of renewable electricity in Nigeria.

(b) Electricity sector reform

The electricity reform that started in 2001 is a centrepiece of the *EPSR Act*.[337] The GoN kickstarted the process with the inauguration of the National Council on Privatization, which in turn inaugurated the Electric Power Sector Implementation Committee (EPIC) to work out modalities for the reform. The EPIC produced the 2001 National Electric Power Policy that

[333] Electric Power Sector Reform Act 2005 s 63; FMP (n 20) 24; FMPS, *Renewable Energy Policy Guidelines* (n 19) 16; NERC, *How Much Do I Pay for Electricity?* <https://www.nercng.org/index.php/home/consumers/how-much-do-i-pay-for-electricity>; Rural Electrification Agency, *Rural Electrification Policy – Ensuring Right Policies in Place* <http://rea.gov.ng/rea-policy-objectives/>.

[334] Electric Power Sector Reform Act 2005 ss 31, 88(1); Worika, 'Rural Applications' (n 260) 280.

[335] FMPS, *Renewable Electricity Policy Guidelines* (n 19) 20; GIZ, *Nigerian Energy Support Programme* (n 272) 92–3.

[336] KPMG (n 192) 23.

[337] World Bank, *Nigeria's Energy Future: More Power to More People* (2009) 7.

was later approved by the National Council on Privatization. The recommendations and regulatory proposals in the National Electric Power Policy formed the crux of the *EPSR Act*.[338] The reform process took part in three distinct stages: the transition stage, the pre-privatisation stage and the post-privatisation stage.[339] Among the tasks set for the transition stage were: the setting up of an initial holding company, the subsequent transfer of assets and liabilities of the NEPA to the initial holding company, and the incorporation of a successor company to the NEPA (as well as licensing and privatisation of the successor company). The PHCN emerged as the successor company to the NEPA.[340]

Like the NEPA, the PHCN failed to bring about the anticipated competitive electricity market owing to the fact that it was still a government-owned entity. Some important processes could not be completed within the prescribed period, which affected the activities of the PHCN. In 2010, the Roadmap for Power Sector Reform was approved to ensure that the remaining reform processes were carried out.

The Roadmap for Power Sector Reform has two broad objectives: service delivery and reform.[341] The roadmap is designed to provide modalities for some of the reform processes in the EPSR Act that had not yet been implemented, and sets modalities for the unbundling of the PHCN into different segments.[342] The roadmap emphasised the need to develop independent power projects and the transfer of ownership to private entities through either 'outright sales or

[338] Amadi, 'Improving Electricity Access' (n 38) 348.

[339] Oluseye Arowolo, 'Nigerian Power Sector Reform: Why Distribution Requires a Clear Strategy' (2005) 7 *International Energy Law and Taxation Review* 163, 167.

[340] Electric Power Sector Reform Act 2005 ss 1, 31, 88.

[341] Presidential Task Force on Power, *Roadmap for Power Sector Reform* (Presidency, 2010); Beks Dagogo-Jack, 'Status Report on the Nigeria Power Sector Reform' (Annual West African Power Industry Convention, Lagos, 19–21 November 2012) 9 <https://www.esi-africa.com/wp-content/uploads/Beks_Dagogo.pdf>. The roadmap is to be reviewed from time to time. The first revision took place in 2013. See Nigeria Electricity Hub, *Roadmap for Power Sector Reform – Revision I (2013)* (7 November 2016) <http://www.nigeriaelectricityhub.com/download/roadmap-for-power-sector-reform-revision-i/>.

[342] One of the reform processes that were not undertaken within the prescribed period was the unbundling of the Power Holding Company of Nigeria.

concession'.[343] Following the roadmap, the GoN divested its interests in the electricity generating plants to various private GenCos in 2010.[344]

The roadmap also emphasised that the federal government needed to provide finance to encourage the use of RE for electricity generation, as well as setting targets for power generation.[345] It recommended strengthening the powers of the NERC in a bid to mitigate obstacles to private sector involvement in the electricity sector.[346] The GoN in 2013 revised the roadmap to fine-tune plans and strategies to keep driving power sector reform and, through that reform, to try to set Nigeria on a course to produce clean and efficient electricity.[347]

Following the adoption of the roadmap, the GoN set up the Presidential Action Committee on Power to drive the process of unbundling the PHCN, which had not yet occurred.[348] The government also established the Presidential Task Force on Power to coordinate the activities of the agencies saddled with the task of removing legal and regulatory obstacles to private sector investments in the power sector.[349] The work of the Presidential Action Committee on Power culminated in the separation of the electricity industry into three distinct 'functions' in 2013, that is, the generation, the distribution and the transmission functions. Following these divisions, the PHCN was unbundled into 18 privatised companies comprising 6 GenCos, 11 distribution companies (DisCos) and 1 transmission company.[350] Prior to the unbundling of electricity functions, the PHCN owned all the electricity generation stations, the transmission system and the distribution network. With the unbundling, the DisCos are now the owners of the distribution network through which they (DisCos) supply electricity to the end-users.[351] In

[343] Presidential Task Force on Power (n 345) 10, 23, 25; Dagogo-Jack (n 345).
[344] See World Bank, *Nigeria's Energy Future* (n 341) 5.
[345] Presidential Task Force on Power (n 345) 40–2.
[346] Ibid 10.
[347] Nigeria Electricity Hub, *Roadmap for Power Sector Reform* (n 345).
[348] Presidential Task Force on Power (n 345) 1, 49–54; Umar A Dubagari, 'Privatization of Nigeria's Power Sector from the Perspectives of the General Agreement on Trade in Services (GATS)' (2018) 23(1) *IOSR Journal of Humanities and Social Science* 16, 20–1.
[349] KPMG (n 192) 24.
[350] Amadi, 'Improving Electricity Access' (n 38) 352; World Bank, *Nigeria's Energy Future* (n 341) 5.
[351] George Etomi, Discos can only distribute available Power, ThisDay Interview 31 January, 2017 <https://www.thisdaylive.com/index.php/2017/01/31/discos-can-only-distribute-available-power/>. In addition

Nigeria there are no separate electricity retailers; the DisCos sell electricity directly to the end users within their areas of operation.[352]

Electricity Generating Companies (GenCos)

The transfer of the government's shares to the GenCos opened a new chapter in the ownership structure of electricity generation in Nigeria. Between 1972 when NEPA was created and 2005 when the EPSR Act was enacted, the GoN owned about 94% of the electricity generation plants, and 100% of the transmission and distribution segments.[353] With the privatisation of the PHCN and the unbundling of the electricity sector, electricity generation becomes the responsibility of private companies, that is, the GenCos.[354] The GoN's shares in the electricity generating plants were sold to private investors without any prior liabilities in the expectation that that the private investors would bring in more funds into the electricity sub-sector.[355] The six GenCos between them own three thermal plants, and three hydro plants operated under concession agreements.[356] The GenCos are expected to work with the NBET and the Gas Aggregator, the latter of which was created to ensure that the GenCos have access to gas supply at regulated prices.[357] Given that the GoN is no longer involved in electricity generation, it is now the responsibility of the GenCos to ensure the deployment of RE sources in electricity

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to the DisCos, there are independent electricity distribution networks. These are individuals or groups that have been licensed by the Nigerian Electricity Regulatory Commission to supply electricity to areas that are poorly serviced by the DisCos. See, John Chibueze and Eniola Sadare, 'Electricity regulation in Nigeria: Overview, Practical Law', (Thomson Reuters 2019) <https://ca.practicallaw.thomsonreuters.com/7-584-2605?transitionType=Default&contextData=(sc.Default)&firstPage=true>.

[352] Chibueze and Sadare (n 355); Michelle Akpaka, Chiagozie Hilary-Nwokonko, Gloria Biem and Onyinye Dimkpagu, *Alternative Energy and Power 2020: Law and Practice*, Streamsowers & Köhn, 22 July 2020 <https://practiceguides.chambers.com/practice-guides/comparison/500/5380/8497-8507-8513-8517-8523-8534>.

[353] GIZ, *Nigerian Energy Support Programme* (n 272) 29.

[354] Dalberg Global Development Advisors (n 245) 61.

[355] For instance, it was anticipated that North South Power Limited, the company that was granted a 30-year concession over the Shiroro power project, would spend around US$50 million within the first 5 years to upgrade electricity plants within the areas of concession. See Copperbelt Energy Corporation, *Shiroro Hydro Concession* <http://cecinvestor.com/shiroro-nigeria/>.

[356] Out of these 6 GenCos, 3 were sold outright while the remaining 3 were under concession agreements with private operators. The three plants under concessions are Kainji, Jebba and Shiroro. See World Bank Program-for-Results Financing, *Power Sector Recovery Program (PSRP): Final Report, Environmental and Social System Assessment (ESSA)* (2018) 6; Presidential Task Force on Power (n 345) 7.

[357] Papaefstratiou (n 332).

generation so as to meet the various renewable electricity targets in the policy.[358] The GoN is to provide economic instruments and set renewable goals that will guide the GenCos in the performance of their electricity generating function.[359] It should be noted that neither the *EPSR Act* nor the REFiT has explicitly imposed the obligation to explore RE on the GenCos.

Nigerian Bulk Electricity Trading (NBET)

NBET was incorporated in 2010 as a government-owned entity for bulk purchasing and resale of electricity.[360] Also known as a bulk trader, NBET further serves as a vehicle for addressing the challenges of bankability of electricity projects in Nigeria.[361] NBET acts as an off-taker of electricity (including renewable electricity) by procuring electricity on a competitive basis using power purchase agreements (PPAs).[362] Under a licence from the NERC, NBET enters into long-term PPAs with the electricity GenCos (including the independent power producers) for the purchase of electricity.[363] The PPAs contain a tariff structure setting out in detail how NBET will pay for the electricity generated during the lifespan of the PPAs.[364] NBET in turn re-sells electricity it purchased to the electricity DisCos under a vesting contract.[365] With these functions, NBET serves as a link between the GenCos and DisCos using PPAs and vesting contracts as the vehicles. Apart from the PPAs and the vesting contracts, NBET also executes grid-connection agreements.[366]

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[358] Ekpo (n 187) 7.

[359] FMP (n 20) 37.

[360] The Bureau of Public Enterprises owns 80% while the Ministry of Finance owns the remaining 20%. See KPMG (n 192) 25.

[361] Busayo Oladejo, 'Understanding the Nigerian Power Sector', *Spark Online* (7 March 2017) <http://sparkonline.com.ng/2017/03/understanding-the-nigerian-power-sector-nbet.html>.

[362] EPSR Act s 68(2); NBET (n 244) 4.

[363] New Energy Research Project, *Nigerian Bulk Electricity Trading Plc* (2017) <http://nerp.abv.ng/index.php/agency/nigerian-bulk-electricity-trading-plc/>.

[364] Papaefstratiou (n 332).

[365] Nigerian Bulk Electricity Trading Plc (NBET), *Form Vesting Contract* (2018) <http://nbet.com.ng/our-customers/distribution-2/form-vesting-contracts/>; World Bank Program-for-Results Financing (n 360) 6.

[366] Feed-in Tariff Regulation s 3(f), (g); Yesufu Longe, 'Opportunities in the On-Grid RE Sector in Nigeria', *Nigerian Bulk Electricity Trading Company* (June 2016) 8 <https://www.africa-eu-renewables.org/wp-content/uploads/2016/11/NBET-Opportunities-in-the-on-grid-RE-section-in-Nigeria.pdf>.

NBET is committed to achieving energy diversification to include electricity from RE sources in the nation's energy mix. In 2016, NBET signed PPAs with some GenCos for the generation of 1 GW of electricity from solar photovoltaic (PV).[367] NBET's effort at improving electricity generation from renewable sources has begun to yield results, although its impacts remain marginal to date (explained further below).[368]

Electricity tariffs and the REFiT

The price of energy is an important consideration when deciding the choice of an energy source. As stated above, the NERC is the industry regulatory body, and in that role, it has set tariffs for electricity generation, distribution and transmission. The aim of the distribution tariff is to ensure fair tariffs for electricity users without compromising returns on investments of investors. NERC establishes a methodology, known as the Multi Year Tariff Order for determining electricity prices. The Multi Year Tariff Order is an incentive-based tariff model that seeks to reward the attainment of certain benchmarks.[369] The tariff structure is for a period of 15 years with an option for minor and a major review every two and five years respectively.[370] The tariff is negotiable provided an electricity generator can prove to the NERC that the costs of generating electricity from RE source negate the assumptions of the tariff structure.[371]

In relation to electricity generation, the NERC promotes renewable electricity by providing an enabling environment and setting modalities for connecting electricity generated to the grid.[372] Through its 2015 Regulation on Feed-In Tariff for Renewable Energy Sourced Electricity in

[367] M Y Roche, N Ude and I Donald-Ofoegbu, 'True Cost of Electricity: Comparison of Costs of Electricity Generation in Nigeria' (Nigerian Economic Summit Group and Heinrich Boll Stiftung Nigeria, 2017) 15.

[368] Nigerian Electricity Regulatory Commission (NERC), Regulation on Feed-in Tariff for Renewable Energy Sourced Electricity in Nigeria (2015) s 5. The REFiT sets a 10% target for renewable electricity by 2020. Ibid s 8(a).

[369] NERC, *Electricity Tariff in Nigerian Electricity Supply Industry* <https://www.nercng.org/index.php/home/myto>; KPMG (n 192) 28.

[370] KPMG (n 192) 29.

[371] Emodi, Energy Policies for Sustainable Development Strategies (n 118) 61.

[372] O H Onyi-Ogelle, 'The Implication of Legal Reforms in the Nigeria Power Sector' (2016) 10(3) *African Research Review* 279, 284.

Nigeria, the NERC grants priority access for connecting renewable electricity generated to the grid, as well as concessions for RE within the grid.[373] In addition to REFiT, the NERC has also established two other classes of tariff for renewable electricity: net metering and competitive bidding. Net metering applies where the capacity of renewable electricity projects is below 1 MW,[374] while the REFiT applies where the capacity of a renewable electricity project is greater than 1 MW and up to a set capacity (solar (5 MW), biomass (10 MW), wind (10 MW) and small hydro (30 MW)).[375] A competitive tender applies where the capacity of a renewable electricity project is greater than the capacity set for the REFiT. The NERC is yet to come up with a framework for the operation of competitive bidding and net-metering as it has done for the FiT.[376] The net-metering has been under development since 2018.[377] The absence of regulation for technology capacities below and above the REFiT threshold is affecting the uptake of renewable-sourced electricity particularly off-grid renewables.[378]

The REFiT is perhaps Nigeria's most important mechanism to encourage the uptake of renewable electricity. It is an economic instrument designed to promote investment in renewable electricity generation from RE sources in Nigeria. The REFiT, among other things, provides for guaranteed minimum prices for renewable electricity, prioritised grid connection access for renewable electricity, and mandatory purchase obligations. Through REFiT, Nigeria plans to attract investments for not less than 2000 MW of electricity from solar, biomass, wind and small hydro by 2020. NBET, as an off-taker, is obligated to purchase 50% of the renewable

[373] NERC, Regulation on Feed in Tariff (n 372) s 3, 8(f); Nigerian Electricity Regulatory Commission (NERC), *Renewable Energy Sourced Electricity* <http://www.nercng.org/index.php/home/operators/renewable-energy>.
[374] NERC, *Renewable Energy Sourced Electricity* (n 377).
[375] Ibid.
[376] NACOP, *Sustainable Energy for All Action Agenda* (n 16) 81; Norbert Edomah, 'On the path to sustainability: Key issues on Nigeria's sustainable energy development' (2016) 2 Energy Reports 28, 31. The REFiT provides that capacity below and above the feed-in tariff capacities shall be procured by net-metering and competitive bidding respectively. See, NERC, *Regulation on Feed in Tariff* (n 372) s 4(b).
[377] Nextier Power Dialogue Communiqué, 'Bridging the Collection Gap: Meter Asset Provider Regulations and Industry Outlook', a power dialogue held in Abuja on 27 February 2019, 4 <https://www.detailsolicitors.com/wp-content/uploads/2019/03/Nextier_Communique-February2019.pdf>
[378] Offgrid Nigeria, United Nations Framework Convention on Climate Change, 3 March, 2018 <https://www.offgridnigeria.com/nigeria-readies-three-solar-mini-grid-plants-concessioning/>

electricity target (that is, 1,000 MW).[379] No obligation is imposed on the off-taker to purchase electricity from RE sources above the 2,000 MW in the REFiT. The excess electricity above 2,000 MW can be purchased under a separate PPA.[380] FiTs have been used successfully in other countries, such as Germany, to overcome costs barriers to RE and drive the uptake of renewable electricity. However, the REFiT in Nigeria has not been effective for a number of reasons. Two of these reasons will be discussed here.

First, FiTs across the globe may impose a legal obligation on off-takers of electricity to purchase RE-sourced electricity on a priority basis, accompanied by priority access and connection to the grid for RE. The *EPSR Act* and the REFiT have not been able to achieve this objective. Renewable electricity in Nigeria faces the challenges of priority access to the network and grid connection.[381]. The grid connection regime in the *EPSR Act* for connecting electricity to the national grid is based on the non-principle of discrimination.[382] Access to the network for renewable-sourced electricity is also on the basis of the non-discrimination principle.[383] There is no policy or legal provision specifying whether a particular energy source should be accorded priority or exception in accessing the network.[384] Consequently, the connection of electricity from RE sources to the grid is a function undertaken by the transmission operators, according to the principle of non-discrimination, and is not governed by special rules.[385] The absence of prioritised access to the network is a major challenge which is

[379] NERC, *Regulation on Feed in Tariff* (n 372) ss 3, 5(f), 8(f), (h); NERC, *Renewable Energy Sourced Electricity* (n 377).
[380] NERC, *Regulation on Feed in Tariff* (n 372) s 5(c).
[381] Peter Kayode Oniemola, 'Developing a Legal Framework for Promoting Investment in Renewable Energy in the Nigerian Power Sector: An Analysis of the Design and Implementation Challenges' (PhD Thesis, University of Aberdeen, 2014) 93.
[382] Electric Power Sector Reform Act 2005 s 82(4), (5).
[383] EPSR Act 2005, s. 82(4)&(5); Babatunde Irukera and Ikem Isiekwena, 'Nigeria' in Earle H O'Donnel, *Electricity Regulation* (Getting The Deal Through, Law Business Research Limited, London 2009) 155 cited in Oniemola, 'Developing a Legal Framework for Promoting Investment in Renewable Energy in the Nigerian Power Sector' (n 385) 93.
[384] Ibid.
[385] Ibid.

affecting the introduction of renewable-sourced electricity to the Nigeria electricity market.[386] The rationale behind the non-discrimination provisions is to make the electricity sub-sector more competitive.[387] As a result of the non-discrimination provisions, for both network access and grid connection, renewable electricity does not enjoy a special status as envisaged by the prioritised access in the REFiT. The provision of the *EPSR Act* on non-discrimination negates one of the fundamental roles of legislation in promoting SE, which requires the provision of a distinct legal framework dedicated to the development of RE.

Another challenge of REFiT for achieving SE and SD is in the area of subsidy implementation. The end users of electricity supplied through the national grid (primarily gas and hydro) enjoy subsidised electricity, whereas the end users of electricity from mini-grids having a capacity of less than 1 MW (largely solar energy) do not enjoy this privilege. This creates inequality in electricity tariffs between end users in urban and rural areas.[388] The inequality may worsen the problem of unequal access between urban and rural areas if not carefully addressed.

Rural Electrification Programme (REP)

The REP is the most widely recognised electricity program in Nigeria. The REP was conceived as a means of addressing the electricity imbalance between urban and rural areas. The aim is to speed up access to clean energy use and consequently raise the living standards of people in rural areas.[389] As the primary program for achieving access to modern electricity services in rural areas, it is fundamental to achieving SE and hence SD.

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[386] Kaisan Muhammad Usman, Aminu Haruna Isa and Johnson Oluyemi Ojosu, 'Renewable Energy Financing: Towards a Financing Mechanism for Overcoming Pre-Commercialization Barriers of Renewable Energy Financing System in Nigeria' (2012) 3 (4) International Journal of Scientific & Engineering Research 1–8, 3.

[387] Oniemola, 'Developing a Legal Framework for Promoting Investment in Renewable Energy in the Nigerian Power Sector' (n 385) 93; Maria Vagliasind, *Implementing Energy Subsidy Reforms: Evidence from Developing Countries* (World Bank, 2013) 248.

[388] Dalberg Global Development Advisors (n 245) 50.

[389] GIZ, *Nigerian Energy Support Programme* (n 272) 28, 51; Sanusi Ohiare, 'Expanding Electricity Access to All in Nigeria: A Spatial Planning and Cost Analysis' (2015) 5(8) *Energy, Sustainability and Society* 2; Worika, 'Rural Applications' (n 260) 262.

The program started in 1981 with the creation of the Nigerian Rural Electrification Programme (NREP).[390] The focus of the REP then was mainly grid extension.[391] Consequently, the NREP connected not less than 600 local government headquarters and some communities/villages to the national grid through grid extension.[392] The NREP did not, however, record impressive results as far as electricity expansion was concerned. Although some local government headquarters were connected, many other areas were not connected due to the high costs of constructing the grid and other electricity connection costs.[393]

Given the poor results, and the need to further accelerate electricity access rate in the country, the REP was re-organised in 2007 following the passage of the *EPSR Act* into law. A new body, the REA, was inaugurated to drive the program based on certain set mandates, one of which is the exploitation of RE resources in providing electricity to rural communities.[394] The vision of the REA is to mobilise capital for sustainable private-sector-driven investments to promote access to electricity in rural areas. Its main functions include coordination of rural electrification projects, regulation of rural electricity and management of the Rural Electrification Fund (REF) (see further below).

In addition to the REA, the FMPWH maintains a department known as Renewable and Rural Power Access. This department is responsible for use of RE for the REP. The FMPWH provides directions on the deployment of RE resources for electricity in remote areas, upgrading the existing power grids to meet standards and monitoring future power projects to achieve a balanced electricity supply mix.[395]

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[390] FMPS, *Renewable Electricity Action Program* (n 215) 8.
[391] Ibid.
[392] FMPWH (n 311) 4.
[393] Francis O Akpojedje, Monday E Onogbotsere, Emmanuel C Mormah and Peter E Onogbostere, 'A Comprehensive Review of Nigeria Electric Power Transmission Issues and Rural Electrification Challenges' (2016) 31(1) *International Journal of Engineering Trends and Technology* 1, 1.
[394] Electric Power Sector Reform Act s 88(1); GIZ, *Nigerian Energy Support Programme* (n 272) 16–17, 51.
[395] Federal Ministry of Power, Works and Housing, *Our Mandate* <http://www.pwh.gov.ng/index>; FMPS, *Renewable Electricity Policy Guidelines* (n 19) 20; GIZ, *Nigerian Energy Support Programme* (n 272) 50-1, 93.

In 2009, the REP was suspended. It was clear yet again that the program had failed to deliver on its mandates. The REP was re-packaged and re-launched in 2012 based on the power sector reform objectives.[396] In line with the reform objectives, government policy on the REP identifies the potential of RE to provide sustainable and reliable electricity access (both off-grid and on-grid) in rural areas.[397] The program identifies wind, solar and hydro resources as commercially viable and cost-effective RE resources that can be deployed to provide electricity to rural areas.[398]

There are three approaches to electricity access expansion under the repackaged REP.[399] First, the electricity grid will be extended to proximate areas to connect more communities.[400] Secondly, there will be construction of mini-grids in remote areas where there are high electricity demands and population density, but grid extension is not economically viable.[401] In this case, the government will deploy either fossil-fuel energy or 'renewable resourced-powered technology generation' to power the mini-grids. About 10,000 mini-grid sites with a combine capacity of 3,000 MW have been identified, and may be available by 2023.[402] Thirdly, the government will deploy standalone systems in remote areas with low population density but electricity demand.[403] Solar PV will be used in remote areas with scattered small roads, where access is very difficult.[404] The main considerations between whether to deploy mini-grids or standalone systems are therefore population density and the volume of electricity demand. The FMPWH has approved an implementation plan that will increase the rate of electricity access in rural areas. The newly developed implementation plan underscores the importance of

[396] Julius E Elusakin, Olufemi O Ajide and Chucks J Diji, 'Challenges of Sustaining Off-Grid Power Generation in Nigeria Rural Communities' (2014) 2(2) *African Journal of Engineering Research* 51, 53; Belije Madu, 'Sustainable Rural Electricity for Nigeria: Way Forward', *This Day*, 6 February 2016 <https://www.pressreader.com/nigeria/thisday/20160206/282144995385597>.
[397] FMPS, *Renewable Electricity Policy Guidelines* (n 19) 3; Kukoyi and Esan (n 241) 111.
[398] NPC (n 22) 136, 138.
[399] EPSR Act 2005 s 88(9); FMPWH (n 311) 10–11; FMPS, *Renewable Electricity Policy Guidelines* (n 19) 5.
[400] FMPS, *Renewable Electricity Action Program* (n 215) 9.
[401] Ibid; IRENA, *Policies and Regulations* (n 100) 21.
[402] Ibid.
[403] Rural Electrification Agency, *The New Paradigm for Rural Electrification* <http://rea.gov.ng/themasterplan/>.
[404] FMPS, *Renewable Electricity Action Program* (n 215) 9.

community and privately owned mini-grids in the attainment of the rural electrification goals.[405] Based on the law, there is no obligation to use RE in the implementation of the REP. The use of RE, especially solar PV, exist as a matter of regulatory strategy.

In the area of funding, there is a Rural Electrification Fund (REF) for the purposes of promoting equitable electricity access among the rural population.[406] The REF exists to ensure that the REP delivers on its mandates of expanding electricity access as well as increasing the use of RE in power generation in rural areas. The *EPSR Act* empowers the REA to administer the REF for the purpose of promoting grid expansion to rural areas and developing off-grid electricity to ensure equitable regional electricity access. Eligible electricity consumers and licensees are required to contribute to the REF at a rate set by the NERC.[407] The other fund in the *EPSR Act*, that is, the Power Consumer Assistance Fund is not meant for the REP.[408] Rather, the *EPSR Act* set up the Power Consumer Assistance Fund ('PCAF') for the purposes of subsiding electricity to consumers who otherwise could not afford the cost of electricity. Also the NERC has, pursuant to its regulatory powers, prepared guidelines for the regulation of mini-grids that are less than 100 kW, the purpose of which is to create enabling investment climates necessary to stimulate rural electrification projects in Nigeria.[409] Looking at the performance of the program so far, there is no evidence to show that the REP has delivered on some of its mandates. The program still faces a number of challenges, among them corruption, inadequate funding and lack of reliable data.[410] There is no data to show that the program is anywhere near close to achieving the 75% electricity access target by 2020, including increased use of RE for power production. All of these problems need to be addressed if the program is to realise its goals.

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[405] IRENA, *Policies and Regulations* (n 100) 24.
[406] EPSR Act 2005 s 88(11).
[407] Ibid ss 88(13), 89(1); KPMG (n 192) 24.
[408] EPSR Act 2005 s 83.
[409] Nigerian Electricity Regulatory Commission, *Regulation for Mini-Grids 2016* (Regulation No NER/-R-110/17).
[410] Akinola Ajibade, 'Why Nigeria's Rural Electrification Projects are Delayed', *The Nation* (Online)' 25 October 2018 <http://thenationonlineng.net/why-nigerias-rural-electrification-projects-are-delayed/>.

Other Support Mechanisms

Globally, a number of incentives have evolved over the years as support mechanisms to boost electricity generation from RE sources. Some of these mechanisms are economic or regulatory, while others are information-based or voluntary tools.[411] In electricity markets, support mechanisms such as subsidies, renewable portfolio standards, FiTs and tax have been widely accepted and applied to promote electricity from RE sources.[412] In Nigeria, as well as the REFiT, there are some other (limited) support mechanisms such as soft loans, subsidies and tax relief.[413]

In Nigeria, certain tax provisions apply as fiscal measures to incentivise the use of RE for electricity.[414] In the energy policy, manufacturers of RE equipment may be entitled to a five-year tax holiday and a two-year exemption from customs duties on imported RE equipment.[415] There are grants and subsidies for off-grid electricity in the NREEEP to alleviate the initial costs of RE projects, loan supports and risk mitigation.[416] In the *Industrial Development (Income Tax Relief) Act,* a power producing company with a pioneer status may benefit from three years of tax relief and a further extension for another term of two years.[417] The beneficiary company will enjoy this tax relief period upon the presentation of a pioneer certificate.[418] The government grants pioneer status to companies to increase the number of companies that can drive the SD of the country.[419]

However, these taxes (along with the REFiT and prioritised access to the grid) have been insufficient to drive the transformation to RE. RE legislation implementing a supply-side

[411] Neil Gunningham and Darren Sinclair, 'Regulatory Pluralism: Designing Policy Mixes for Environmental Protection' (1999) 21(1) *Law & Policy* 49, 49.
[412] Pen Sun and Pu-yan Nie, 'A Comparative Study of Feed-in Tariff and Renewable Portfolio Standard Policy in Renewable Energy Industry' (2015) 74 *Renewable Energy* 255; Davies (n 100) 312–13.
[413] FMP (n 20) 4, 24, 38; NACOP, *National Renewable Energy Action Plans* (n 291) 31.
[414] Dalberg Global Development Advisors (n 245) 50.
[415] FMP (n 20) 38.
[416] Dalberg Global Development Advisors (n 245) 50.
[417] Industrial Development (Income Tax Relief) Act 2004 s 10; KPMG (n 192) 35–6.
[418] Industrial Development (Income Tax Relief) Act 2004 ss 1(2), 2.
[419] Oniemola, 'Why should Oil Rich Nigeria' (n 36) 33.

mechanism such as a RE portfolio standard, or mandatory RE targets for generation companies, or a power production tax credit, have a role to play in this regard.

3.4 Critical Analysis

There are three ambitious targets for RE in Nigeria: increased energy availability (energy security), improved access (energy equity) and protection of the environment (environmental sustainability).[420] In pursuing renewable electricity targets, however, the GoN pays particular attention to availability of affordable electricity. There is an underlining assumption in the energy policy that increasing the uptake of RE for electricity generation will result in access to more megawatts of electricity (energy security and energy equity objectives). There is no specific provision either in the *EPSR Act* or the policy on how the security of the environment will be achieved and sustained. Although RE source is environmentally friendly, the inclusion of fossil energy source (coal, gas and hydro) in the electricity mix will have impact on the environment.[421] The current legal and regulatory structure for electricity does not address the environmental impact of the fossil-fuel sources.[422] The NERC, the sole electricity regulator, does not have specific mandate to ensure that electricity generation promotes the security of the environment.[423] The proposed electricity generation mix for sustainable electricity in Nigeria may not achieve a balance among the elements of SE.[424]

Prior to passing the *EPSR Act* into law in 2005, the federal government, acting through the Federal Ministry of Power, was solely responsible for policy formulation and regulation, and mobilisation of investment in the electricity sector. The passage of the *EPSR Act* has fundamentally changed the structure of the electricity sector, with private companies now controlling a substantial percentage of electricity generation and distribution functions. A

[420] See p. 31; Chibueze Ebii, 'Can Nigeria Meet its Electricity Goals by 2030? We found out' (Heinrich Boll Stiftung, 2019) <https://ng.boell.org/en/2019/10/11/can-nigeria-meet-its-electricity-goals-2030-we-found-out>.
[421] See p. 50.
[422] Nigerian Electricity Regulatory Commission (NERC), *Our Role* <https://nerc.gov.ng/index.php/about/role>.
[423] Ibid; Electric Power Sector Reform Act s 32(1).
[424] See p. 20.

fundamental purpose of the *EPSR Act* was to bring about electricity industry reform, to promote competition and hence efficiency in supply, and to increase the supply of electricity to meet demand. However, as the major Act relevant to the uptake of renewable electricity, the legislation has failed to bring about a meaningful increase in renewable electricity generation and supply.

There has been no meaningful uptake in renewable-sourced electricity generation in Nigeria.[425] Looking at the performance so far, particularly as it relates to the actualisation of the renewable electricity targets, the result is not impressive.[426] Nigeria has not connected a megawatt of renewable electricity to the grid and, although Nigeria has achieved off-grid renewable electricity (through mini-grids and standalone systems), this remains marginal.

The high cost of RE projects is affecting Nigeria's aspiration to increase production of electricity from RE sources.[427] A transition from fossil-based electricity to clean electricity from renewable sources involves major changes to electricity infrastructure and the pattern of energy usage.[428] It requires the deployment of up-to-date and environmentally friendly technologies such as wind turbines, photovoltaic cells, remote-sensing devices and storage batteries. These technologies are capital intensive and involve substantial initial investment costs since they are not readily available in Nigeria.[429] The high capital cost is one of the reasons why Nigeria has not achieved a significant uptake in renewable electricity, and the current law and policy has not been effective in addressing this issue.[430]

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[425] Barros et al (n 314) 65.

[426] See pp. 56-7.

[427] Kenneth E Okedu, Roland Uhunmwangho and Promise Wopara, 'Renewable Energy in Nigeria: The Challenges and Opportunities in Mountainous and Riverine Regions' (2015) 5(1) *International Journal of Renewable Energy Research* 222, 223.

[428] C R Monroy and A S Hernandez, 'Strengthening Financial Innovation in Energy Supply Projects for Rural Exploitations in Developing Countries' (2008) 12(7) *Renewable and Sustainable Energy Reviews* 1928; Christopher Flavin and Molly Hull Aeck, *The Potential Role of Renewable Energy in Meeting the Millennium Development Goals* (Paper prepared for the Renewable Energy Policy Network for the 21st Century, Worldwatch Institute) 17.

[429] Olawuyi (n 32); Olayinka S Ohunakin, 'Solar Energy Applications and Development in Nigeria: Drivers and Barriers' (2014) 32 *Renewable and Sustainable Energy Review* 294, 299.

[430] Presidential Task Force on Power (n 345) 36.

There is also a lack of investment in RE resources for electricity generation. Although one of the aims of the *EPSR Act* is to facilitate inflow of capital funding for the electricity sector, there is no specific target for renewable electricity. The low level of investment in RE has hampered the country's renewable electricity expansion. According to the Vision 20:20 Program, Nigeria will require value-chain investments of about $3.5 billion to meet the 40,000 MW grid capacity target by 2020.[431] Nigeria requires additional investments of $187 billion for the Sustainable Development Goals for electricity by 2030, and another $878 billion for electricity infrastructure over the next 25 years.[432] The reality is that Nigeria cannot finance these investments, and private investments in renewable electricity are not forthcoming. The average annual investment on renewable electricity in Nigeria is not anywhere near what is required to develop electricity generation from RE sources.[433] Reliance on subsidised petroleum products is another factor that is undermining the development of RE for electricity in Nigeria. The bulk of money that could be allocated to develop other sectors of the Nigerian economy, most importantly the electricity sector, is being spent as subsidies on petroleum.[434]

The *EPSR Act* does not, however, have the use and exploitation of RE for electricity as one of its focus areas. The preamble to the *EPSR Act* leaves no doubt as to what the Act sets out to achieve. Since the development of RE is not its focus, important provisions such as provision of green funding for RE, support mechanisms, priority access for renewable electricity and RE portfolios are lacking in the *EPSR Act*. This thesis argued in Chapter 2 that renewable electricity cannot compete favourably with fossil-based electricity without a special regime granted to RE.[435]

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[431] Ibid iii.

[432] Jimoh Babatunde, 'Nigeria Needs to Invest $267bn on Electricity by 2040', *Vanguard* (Online), 25 July 2017 <https://www.vanguardngr.com/2017/07/nigeria-needs-invest-267bn-electricity-2040-report/>.

[433] Roche et al (n 356) 5; Ministry of Environment, *Renewable Energy Programme* <http://renewableenergy.gov.ng/fg-signs-n55bn-renewable-energy-agreement-with-ge/>.

[434] Dalberg Global Development Advisors (n 245) 52; Onyemaechi J Onwe, 'Economic Implications of Petroleum Policies in Nigeria: An Overview' (2012) 2(5) *American International Journal of Contemporary Research* 60, 70.

[435] See p. 33.

Some countries enact a law for the regulation of RE so that electricity from RE sources can compete with electricity from fossil sources. This thesis contends that it is only when there is a specific law for the development of electricity from RE sources that key provisions such as green funding, priority connections, rural application of RE and RE portfolios will be guaranteed and promoted in Nigeria. Overall, by not supporting renewables, the *EPSR Act* favours fossil-based electricity, which, as incumbent generation, is better adapted to the current electricity system than renewable electricity[436] Salient provisions that would have advanced the deployment of RE resources for electricity are missing from the *EPSR Act*. Here the study considers some of the provisions of the *EPSR Act* which are impacting on the development of RE. Identifying these provisions will go a long way in charting a new course for the development of RE for electricity generation in Nigeria.

First, Nigeria does not have an affirmative law for the regulation of renewable electricity. The *ECN Act* and the *EPSR Act* were not enacted specifically for the development of RE, hence they have failed to successfully drive Nigeria's renewable electricity objectives. While the focus of the *ECN Act* is the establishment of a commission to oversee research on alternative energy, the *EPSR Act* is enacted purposely for the reform of the electricity sector. The *EPSR Act* is not RE oriented; it does not contain basic provisions that could have advanced the deployment of RE resources for electricity generation. The absence of RE legislation is a major setback to renewable electricity in Nigeria. Uma Outka aptly captures the challenges of law on the development of RE as follows: 'The legal barriers operating in this transitional moment can be usefully conceived in two broad categories: (a) lagging development of affirmative new law

[436] NPC (n 22) 57; Ngozi Chinwa Ole, 'The Nigerian electricity regulatory framework: hotspots and challenges for off-grid renewable electricity development' (2020) 38(4) *Journal of Energy and Natural Resources Law*, 367; Zelda Anne Elum and Vuyo Mjimba, 'Potential and challenges of renewable energy development in promoting a green economy in Nigeria' (2020) 12(2) *Africa Review* 172; Uma Outka, 'Environmental Law and Fossil Fuels: Barriers to Renewable Energy' (2012) 65(1) *Vanderbilt Law Review* 1679, 1681–2.

to support renewable energy, and (b) existing law fashioned in support of a pre-renewables energy sector.'[437]

The *EPSR Act* does not make any explicit reference to any of the RE resources in Nigeria.[438] There are 101 sections in the *EPSR Act*, which are divided into 13 parts. Although section 32 of the *EPSR Act* enjoins the NERC to promote 'the optimal utilisation of resources'[439] for electricity, it does not provide specific guidance on the use of RE resources for electricity. The only reference to RE for power generation in the *EPSR Act* is in section 88(9). Reference to RE in section 88(9) is restricted to power production for the REP, and this clearly negates Nigeria's renewable electricity objectives and the provisions of section 32 of the Act. Nigeria's aspiration has always been to generate renewable electricity, both on-grid and off-grid, in supplying electricity to all parts of Nigeria. The power of the NERC to promote electricity access in section 32 of the *EPSR Act* is wide and covers renewable electricity without any limitation. Therefore, restricting the application of RE resources to power production in rural areas is a fundamental gap in the *EPSR Act*, which is limiting the wider application of RE. As a result of the failure of the *EPSR Act* to provide modalities for the development of RE, Aigbovo and Ogboka posit that the Act is 'a dis-incentive to potential investors in the sector' as far as promotion of electricity from RE sources is concerned.[440] Oniemola also argues that the absence of specific provisions on the development of RE is a major challenge to connecting RE source to the national grid.[441] This casts doubt on the effectiveness of the *EPSR Act* in promoting and regulating renewable electricity in Nigeria.

Secondly, a careful look at the regulatory framework for electricity in the *EPSR Act* shows an apparent disregard for the constitutional division of powers between the GoN and SGs over electricity regulation. By the Constitution, both the GoN and the SGs have power over

[437] Outka (n 440) 1681–2.
[438] In countries that have enacted a law for the development of renewable energy, the practice is to identify and/or explain energy resources that will qualify as renewables. See, Kenya's Energy Act 2019.
[439] Electric Power Sector Reform Act 2005 s 32(a).
[440] Aigbovo and Ogboka (n 24) 26.
[441] Oniemola, '*Powering Nigeria*' (n 35) 34.

electricity functions in Nigeria.[442] On the face of it, in the Constitution, the federal GoN has legislative power in respective of the national grid, while off-grid electricity is within the powers of the SGs.[443] However, in providing for a primarily centralised electricity regulation in Nigeria, the *EPSR Act* may lead to a disregard for the division of powers between the GoN and the SGs in the Constitution.[444] The NERC established in the *EPSR Act* is under the supervision of the Presidency and is the only electricity regulator for all the 36 states of the federation.[445] Renewable electricity targets are for both off-grid and on-grid electricity. Mini-grids and standalone systems in Nigeria are among the REP strategies in Nigeria. REP is also under the supervision of REA, while the construction of mini-grids is within the exclusive preserve of the NERC. Both the NERC and the REA are agencies of the federal GoN. It is arguable that the centralisation of the regulatory functions by the GoN does not take into consideration the constitutional powers of the SGs over electricity not transmitted through the grid.[446] By setting up federal regulators (that is, NERC and REA), which combine the work of both the federal government and the state governments, the federal government appears to be acting contrary to the provisions of the Constitution, which set out the powers of the federal and state Parliaments in relation to electricity regulation in relation to grid and off-grid electricity respectively. The provisions of the *EPSR Act* on the two regulators constitute a major impediment to the development of RE-sourced electricity by the SGs, limiting their activities in the development of RE.[447]

The origin of centralisation of electricity functions can be traced to the political structure that was introduced in 1966 following the first military coup in Nigeria. Prior to 1960 and up to

[442] Oke, 'Conflicting Laws' (n 319).
[443] Concurrent Legislative Lists, Second Schedule to the 1999 Constitution, paras 13, 14; Worika, 'Rural Applications' (n 260) 279. See n 318 above, and accompany text, explaining the allocation of powers in the Constitution.
[444] Oke (n 319); Yinka Omorogbe, 'Nigeria', Energy Law Supplement 5, in R Blanpain and K Deketelaere (eds) *International Encyclopaedia of Laws Energy Law* (Kluwer Law International, Hague/ London/New-York, 2003).
[445] EPSR Act 2005 ss 31, 32; Oke, 'Conflicting Laws' (n 319).
[446] See p. 58; Oke, 'Conflicting Laws' (n 319).
[447] Yemi Oke, 'Challenges and Developments in the Nigerian Power Industry' (2014) *ALP Business Review – Energy* 21, 22.

1966, Nigeria operated a regional system of government whereby powers over policy decisions resided in the regional government. The military government, in a bid to exercise control over every sector of the Nigerian economy after the coup, changed the existing political structure and introduced a single structure economy including the control and governance of energy resources.[448] With this structure, the (central) federal government regulates and takes decisions on matters relating to electricity regulation. Since then successive governments (including democratically elected government) have retained the centralised political structure with attendant effect on the regulation of electricity in Nigeria.

Another observation is that, while the *EPSR Act* establishes regulatory bodies, none of these bodies is specifically given responsibility for developing RE.[449] As a result, there is an overlap of functions and a conflict of responsibilities with no synergy among the regulators. The NERC, the ECN and the FMPWH have all been playing regulatory roles in the development of RE. Each of these bodies have exercised their respective powers on RE particularly in the area of providing policy direction.[450] The ECN has prepared the NEP, while the FMPWH and the NERC have prepared the Rural Electrification Strategy and Implementation Plan and the REFiT respectively, among other regulatory documents. Each of these documents seeks to establish a policy framework for the regulation and development of RE in Nigeria without reference to the powers of the other bodies.

There is an indication in section 88(9) of the *EPSR Act* that the NERC and the REA are involved in electricity production from RE. However, the *EPSR Act* does not set out the extent of the powers of these two bodies. A careful look at section 88(9) shows that reference to renewables for power generation in the *EPSR Act* applies to the Minister of Power in the course

[448] Nobert Edomah, Chris Foulds and Aled Jones, 'The Role of Policy Makers and Institutions in the Energy Sector: The Case of Energy Infrastructure Governance in Nigeria' (2016) 8 *Sustainability* 1, 9.

[449] Although the Electric Power Sector Reform Act did not establish the Federal Ministry of Power, Works and Housing, the Act gives the Ministry certain regulatory powers over the NERC and the REA.

[450] Energy Commission of Nigeria Act ss 4(a),(d),(e),(h), 33; ECN, *Energy Commission of Nigeria's Mission Statement* <http://www.energy.gov.ng/index.php?option=com_content&view=article&id=78&Itemid=89>; Oniemola, 'Powering Nigeria' (n 35) 89.

of preparing a report to be submitted to the President in consultation with NERC and the REA.[451] A manifestation of this uncertainty of functions was witnessed prior to the inauguration of the REFiT. NBET had argued that the powers of NERC in the *EPSR Act* did not cover regulation-making, and that the NERC would be exercising powers above what the *EPSR Act* conferred on it.[452]

The failure to establish a specific body is another major gap in the nation's electricity law on the development of RE for electricity generation. This makes accountability for the state of development of renewable electricity in Nigeria difficult.[453] As Okedu et al state, the failure of government to establish effective coordination among the regulators on RE development is responsible for the problems being experienced in the electricity sector.[454]

Furthermore, the provisions of the *EPSR Act* and the energy policy do not align. Generally, law 'acts as a policy enabler', by aligning with the provisions of the energy policy.[455] While there are support mechanisms in the energy policy for electricity from RE, there is no mention of the support mechanisms in the *EPSR Act*. A lot of incentives in the energy policy, which would be applicable to promoting renewable electricity, are not in the *EPSR Act*.

Finally, non-implementation of RE policies is a major challenge to RE development. Currently, there are about 39 policy documents in the energy sector. The majority of these documents are still in draft form with no definite dates of receiving government approvals.[456] As a result of this, some of the proposed incentives that would have attracted investment in the development of renewable electricity could not be implemented.[457] There are many plans and policies for RE, but these have not been adequately aligned nor actively implemented. The Nigerian government must align RE policy and legislation, to ensure policy is implemented through law.

[451] Electric Power Sector Reform Act 2005 s 88(9).
[452] Chris Ochayi, 'NERC, NBET Disagree over Renewable Energy Policy', *Vanguard* (Online), 18 August 2017.
[453] E L Efurumibe, 'Barriers to the Development of Renewable Energy in Nigeria' (2013) 2(1) *Journals of Biotechnology* 11, 11–12.
[454] NPC (n 22) 57; Okedu et al (n 431) 224.
[455] Omorogbe, 'The Role of Law' (n 1) 219.
[456] Federal Republic of Nigeria, 'The Nigerian Power Sector Investment Opportunities' (n 259) 9.
[457] NACOP, *Sustainable Energy for All Action Agenda* (n 16) 92.

Considering all of these provisions, the *EPSR Act* cannot advance the development of RE in Nigeria. The policy direction alone on the use of RE is not sufficient to drive Nigeria's aspirations in this regard.

3.5 Conclusion

The current composition of Nigeria's electricity supply, which has a significant contribution from thermal sources, provides an opportunity to explore how to increase the share of RE in electricity generation. RE resources, if properly harnessed, will boost the installed capacity and generation, accelerate economic development and expand electricity access Nigeria.[458] Nigeria can combine grid and off-grid renewable electricity (e.g. standalone systems and distributed RE) to obviate the necessity of expanding the grid, which Nigeria cannot afford. The GoN should also consider developing other tariff systems and making them more effective in the same way as REFiT. With net metering, for instance, electricity users can install solar panels to produce electricity for their own use. Any surplus electricity generated by these users, which is not consumed, can be sold back to the grid at the same price. The cost of renewable electricity is another factor that government should carefully consider as this can impact negatively on electricity access.[459] The GoN can provide interventions in the form of subsidies and other assistance to the end users of electricity, particularly rural dwellers to make electricity affordable for them. Government intervention to promote renewable electricity should address both the production and the consumption of electricity. It is advisable that the intervention should be contained in legislation so that it is binding. This way, the deployment of RE resources for electricity generation will not only guarantee energy security but also sustain the contribution of RE to SD.[460] Closely connected to electricity access is the issue of coverage in rural areas. The GoN needs to undertake expansion and modernisation of electricity coverage in

[458] African Development Bank Group, *Federal Republic of Nigeria Country Strategy Paper 2013–2017* (2013) Annex 6, VII.
[459] Tania Urmee, David Harries and August Schlapfer, 'Issues Related to Rural Electrification Using Renewable Energy in Developing Countries of Asia and Pacific' (2009) 34 *Renewable Energy* 354, 355.
[460] Aigbovo and Ogboka (n 24) 27.

the country within the framework of the REP to ensure that electricity access and the expansion program translate into a coherent development policy. In view of the challenges of RE, Nigeria may need to explore either gas-fired or hydro-based electricity side by side with renewable-sourced electricity to ensure a smooth transition from fossil energy sources to RE sources.

In developing a RE law, Nigeria should ensure that SD of the country is one of the key focuses of the proposed law. The GoN should also align the provisions of the energy policy on RE use and SD to ensure that there is a synergy between SE and SD. It is equally important that subsequent electricity reforms and energy/electricity policy in Nigeria should take the economic objectives of the country into consideration. This will obviate a situation whereby the population continues to grow without any corresponding increase in the electricity generation capacity. Nigeria also needs to address the issue of environmental protection which has been left out in the law and the policy. Focusing on availability and access to the exclusion of environmental protection measures will not achieve the goal of a SE system.

It may be helpful for Nigeria to rely on the experience of other countries in drafting RE law. Consequently, this study will undertake a study of RE and electricity generation in Kenya, the second case study of this thesis.

CHAPTER 4

OVERVIEW OF THE ENERGY SECTOR IN KENYA

This chapter reviews Kenya's energy sector vis-à-vis electricity generation and RE uptake. The rationale of this chapter is to show how the legal and regulatory framework has aided uptake of RE for electricity generation in Kenya. As argued in Chapter 1, Nigeria may benefit from useful lessons from a country with a comparable experience, and Kenya has been chosen for this purpose.

Section 4.1 will describe Kenya's energy sector and its commitment to RE and SE. Kenya has moved from a modest beginning to one of the African countries with the most significant contribution of RE in its electricity mix. Section 4.2 will critique the framework, legal and regulatory, for the regulation of electricity in Kenya. Section 4.3 will examine the rural electrification program in Kenya and its linkage with RE development, while Section 4.4 will examine the barriers to renewable electricity in Kenya. This chapter will demonstrate Kenya's commitments towards 'structural, policy and institutional reforms as a means of enhancing the security of the electricity supply and access',[461] and the important role played by the legal and regulatory framework underpinning the uptake of RE in that country.

[461] Ministry of Energy and Petroleum (MoEP), *National Energy and Petroleum Policy (Final Draft)* (Republic of Kenya, 2015) 14.

4.1 Kenya's Energy Profile

4.1.1 Sources of Energy in Kenya

Kenya is an East-African country that shares borders with five other countries, namely, Sudan, Ethiopia, Tanzania, Somalia and Uganda. As at 2017, Kenya had a population of 45 million and a gross domestic product of US$61 billion.[462] Although there was a failed coup in 1982 to oust the government of Arap Moi, Kenya has had a stable democratic rule since the country gained independence from Britain in 1963. It is one of the few African countries that have not experienced military rule.[463] Kenya is regarded as the commercial hub of East Africa and has one of the most thriving economies in that region.[464] An important component of Kenya's economy is energy, which presently comes from a combination of sources: petroleum, RE (biomass, hydro, geothermal, wind and solar), electricity and coal. These energy sources can be classified into non-commercial (biomass) and commercial (petroleum, electricity and coal) energy.[465]

Coal, crude oil, geothermal, small hydro, solar, biomass, wind, tidal waves and biogas are the major energy resources which are available for exploitation in Kenya.[466] Kenya joined the league of crude oil exporting countries when it exported crude oil for the first time in 2019.[467] As is the case in many other African countries, biomass in the form of charcoal, fuelwood and

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[462] International Energy Agency (IEA), *Key World Energy Statistics* (2017) 64 <http://www.iea.org/publications/freepublications/publication/KeyWorld2017.pdf>; Arindam Basu, James D Marett and Stefan Wehner, *Access to Clean Energy in Rural Kenya through Innovative Market Based Solutions* (United Nations Development Programme, 2016) 16.

[463] Boubacar N'Diaye, How Not to Institutionalize Civilian Control: Kenya's Coup Prevention Strategies, 1964-1997' (2002) 28(4) *Armed Forces & Society* 619.

[464] Institute of Economic Affairs, *Situation Analysis of Energy Industry, Policy and Strategy for Kenya* (2015) 11.

[465] Susan M Onuonga, 'The Relationship between Commercial Energy Consumption and Gross Domestic Income in Kenya' (2012) 46(1) *Journal of Developing Areas* 305, 307.

[466] Republic of Kenya, *Updated Least Cost Power Development Plan* (n 41) 43. Tullow Oil, Tullow in Kenya: Significant oil discoveries progressing to development in Kenya <https://www.tullowoil.com/our-operations/africa/kenya/>; Matt Smith, Kenya enters the oil business, Petroleum Economist, 26 September, 2019 <https://www.petroleum-economist.com/articles/politics-economics/africa/2019/kenya-enters-the-oil-business>. The oil was discovered in the Turkana Region in 2012 by Tullow Oil, a British firm. See, Tullow Oil, Tullow in Kenya: Significant oil discoveries progressing to development in Kenya <https://www.tullowoil.com/our-operations/africa/kenya/>.

[467] Joseph Akwiri, Kenya's first crude oil export sparks demands over revenue sharing, Thomson Reuters <https://www.reuters.com/article/us-kenya-oil-idUSKCN1VG1FQ>; Smith (n 470).

industrial residue accounts for about two-thirds of the energy use in rural areas and the energy use of the urban poor. The rural population needs biomass to satisfy their basic daily energy needs such as lighting and heating. Following biomass in terms of contribution is petroleum, which contributes about 22% of total energy consumption.[468] Apart from serving the transport, commercial and industrial sectors as the main energy source, Kenya sometimes uses petroleum for electricity generation.[469] The urban population uses petroleum for generating electricity whilst rural people use it as a substitute for firewood (biomass) to provide lighting.[470] As a result of its many uses, Kenya requires a large volume of petroleum products, and this is the major reason the country imports petroleum products.[471]

Coal, though another source of energy in Kenya, has limited uses. Coal is used mainly by the commercial and industrial sectors for heating furnaces and steam generation. It is also a domestic fossil energy source that is used for power generation, contributing approximately 1% of Kenya's total energy supply. For these purposes, industries in Kenya make use of local coal and imported coal from South Africa and Asian countries. Kenya imports an average of 3.6 million tonnes of coal annually for the use of its manufacturing companies.[472]

Electricity is a secondary source of energy supply in Kenya.[473] The industrial sector consumes about 60% of the total electricity in Kenya while the other sectors (including households) account for the remaining 40%.[474] Electricity generation in Kenya comes from a combination of fossil energy (petroleum, large hydro and coal) and RE (small hydro, geothermal, solar and

[468] Ibid.

[469] Samuel A Sarkodie and Philip K Adom, 'Determinants of Energy Consumption in Kenya: A NIPALS approach' (2018) 159 *Energy* 696, 698.

[470] Tom Oduol Owino, Ernst Kuneman and Ries Kamphof, 'Kenya: A Green Growth Utopia?' (Clingendael Policy Brief, Netherlands Institute of International Relations, 2016) 1; J K Kiplagat, R Z Wanga and T X Li 'Renewable Energy in Kenya: Resource Potential and Status of Exploitation' (2011) 15 *Renewable and Sustainable Energy Reviews* 2960, 2962–3.

[471] Republic of Kenya, *Updated Least Cost Power Development Plan* (n 41) 63; MoEP, *Kenya Action Agenda* (n 29) 12.

[472] Republic of Kenya, *Updated Least Cost Power Development Plan* (n 41) 45, 61.

[473] Rubin Mukkam-Owuor and Elizabeth Kageni, 'Energy 2018: Kenya' in Global Legal Insights, *Energy 2018* (2018).

[474] Energy and Environment Partnership, 'Kenya' <https://eepafrica.org/projects/kenya/>; UNEP (n 196) 12.

wind).[475] Following the passage into law of the Energy Act 2006 and the implementation of the Least Cost Power Development Plan (LCPDP), coal is now one of the energy sources that Kenya plans to explore to meet its obligation of providing cheap and reliable electricity, along with additional generation from RE sources.[476]

4.1.2 Electricity Generation, Sustainable Energy and Renewable Energy Resources

The existing combination of sources for electricity generation has its root in Kenya's past and present economic plans for the energy sector. Following an economic and business expansion drive by the GoK in the 1980s, there was an increase in demand for electricity with the industrial sector dominating.[477] The growth of the modern economy, population increase and urbanisation contributed to the increased demand for electricity.[478] The GoK planned to address the growing electricity demand anticipating that it would further increase, particularly from the industrial sector, as a result of the GoK's economic expansion drive. The GOK recognised it needed to address not only the immediate demand for electricity but also future electricity needs.

At this time, large hydro was the main source of electricity generation, followed by geothermal and petroleum, with little contribution from coal and RE sources.[479] Kenya faced some challenges with these sources of electricity generation. While large hydro was subject to frequent fluctuations in supply, the high costs of importing petroleum often affected the costs of electricity generation. Although the GoK was exploring intensive development phases to address future electricity generation and demands, the development did not bring about the anticipated changes in the electricity sub-sector. The total installed electricity capacity could

[475] Kiplagat, Wanga and Li (n 474) 2962; Onuonga (n 459) 307.

[476] Republic of Kenya, *Updated Least Cost Power Development Plan* (n 41) 49, 54; Njiraini Muchira, 'Coal in Kenya: Necessary Evil or Expensive Error', *The East African*, 8 July 2019 <theeastafrican.co.ke>.

[477] Republic of Kenya, *Updated Least Cost Power Development Plan* (n 41) 30.

[478] Sarkodie and Adom (n 473) 704; World Energy Council, *World Energy Resources (Geothermal)* (2016) 36 <https://www.worldenergy.org/wp-content/uploads/2016/10/World-Energy-Resources-Full-report-2016.10.03.pdf>.

[479] Joseph Kapika and Anton Eberhard, 'Enabling Private-Sector Participation in Electricity Generation' in Joseph Kapika and Anton Ebenhard (eds), *Power-Sector Reform and Regulation in Africa: Lessons from Kenya, Tanzania, Uganda, Zambia, Namibia and Ghana* (HSRC Press, 2013) 21, 21; Onuonga (n 459) 308.

not satisfy Kenyans' electricity needs even if the country produced at maximum capacity. In most cases, there were shortfalls in electricity generation and supply.[480]

As a temporary measure, Kenya imported electricity from the neighbouring countries of Uganda and Tanzania to address the shortfall in electricity supply.[481] However, this negatively affected the residential sector, as many households could not afford electricity, due to the high electricity tariff and the populations' low purchasing power. In these circumstances, the GoK opted for a long-term policy to support diversification of electricity generation sources. The new policy recognised that a combination of RE and fossil energy sources would provide sustainable electricity for the least cost.[482]

Gradually, Kenya's policy on the use of RE as a SE strategy evolved, and has continued to be pursued in the country's energy policy. Diversification of electricity generation sources to include RE is now a fundamental plank of Kenya's SE drive, the rationale for this being that Kenya has the potential to generate affordable and environmentally friendly electricity, at the least cost, using the country's RE resources. As Josine Heijmans aptly puts it: '[r]enewable energy is the only viable solution to support the region's sustainable development, [while] preserving its natural ecosystem'.[483]

Two main objectives can, therefore, be deduced from the diversification of electricity generation sources to include RE sources in Kenya: (a) energy security and (b) environmental sustainability. This can be gleaned from the preamble to the LCPDP which provides that '[t]he broad objective of the energy policy is to ensure adequate, quality, cost effective and affordable

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[480] Republic of Kenya, *Updated Least Cost Power Development Plan* (n 41) 44; Carolyn Fortuna, 'Renewable Energy in Kenya: Meeting the Needs of an Expanding Population', *Clean Technica* (Online), 16 April 2018 <https://cleantechnica.com/2018/04/16/renewable-energy-in-kenya-meeting-the-needs-of-an-expanding-population/>.

[481] Republic of Kenya, *Updated Least Cost Power Development Plan* (n 41) 44, 45; Anton Eberhard and Katharine Nawaal Gratwick, 'Take 4: the Contribution and Evolution of Independent Power Projects in Kenya' (Management Programme in Infrastructure Reform and Regulation Working Paper, 2006) 1, 8.

[482] Republic of Kenya, *Updated Least Cost Power Development Plan* (n 41) 13, 80.

[483] Josine Heijmans, quoted in Jessica Scopacasa, 'Renewable Energy Key to Achieve Kenya's Vision 2030 Goals' (African Renewable Energy Leaders' Summit, Nairobi, 4 April 2017) <https://press.africarenewablesummit.com/renewable-energy-key-to-achieve-kenyas-vision-2030-goals>.

supply of energy to meet development needs, while protecting and conserving the environment by use of natural energy resources'.[484] Both in law and policy, Kenya recognises the use of RE as a key strategy to promote the security of electricity supply, affordability and environmental sustainability.[485] Moreover, Kenya has mainstreamed its SE objectives into the SD objectives to facilitate effective realisation of these objectives. By doing this, electricity generation in Kenya is now being undertaken in such a way that the sustainable electricity objectives fall within the framework of the country's sustainable economic development policy.[486] The pursuit of these twin objectives can be seen in the provisions of Kenya's Renewable Feed-In Tariffs (REFiT):[487]

> The government of Kenya recognises that renewable energy sources (RES) which include wind, biomass, small hydros, geothermal, biogas, solar and municipal waste energy, have potential to generate income and employment, *over and above contributing to the electricity supply and diversification of generation sources*. The National Energy Policy as enunciated in Sessional Paper No.4 of 2004 and operationalized by the Energy Act No. 12 of 2006, *encourages implementation of these indigenous renewable energy sources to enhance the country's electricity supply capacity. The Sessional Paper incorporates strategies to promote the contribution of the renewable energy sources in generation of electricity*.

(a) Energy security

Energy security in Kenya is a prerequisite for national and regional growth; hence the priority it is accorded in both law and policy. Essentially, it refers to the available of energy at all times and at an affordable cost.[488] It has been recognised that RE has a role in ensuring the availability of affordable electricity for economic development. First, RE will reduce Kenya's dependence on imported fossil-fuel energy, which has been identified as a major contributor to

[484] Republic of Kenya, *Updated Least Cost Power Development Plan* (n 41) 43.

[485] Energy Act 2006 s 103(2); Geoffrey A Mabea, Rafael E Macatangay and John Mutua, '60 Years Electricity Reform Progress in Kenya' (USAEE Working Paper, 2018) 6.

[486] Kenya Electricity Transmission Company, *Role of the Ministry of Energy in Contributing Towards Vision 2030* (2020) <https://www.ketraco.co.ke/about/vision2030.html>; Power Africa, *Development of Kenya's Power Sector 2015–2020* (2016) 9.

[487] Ministry of Energy, *Feed-in-Tariffs Policy on Wind, Biomass, Small-Hydro, Geothermal, Biogas and Solar Resource Generated Electricity* (2nd revision, 2012) 5 (emphasis added).

[488] Aschalew Tigabu, Ann Kingiri, Faith Odongo, Rebecca Hanlin, Margrethe Holm Andersen and Rasmus Lema, *Capability Development and Collaboration for Kenya's Solar and Wind Technologies: Analysis of Major Energy Policy Frameworks* (IREK, 2017) 2, 5.

the high tariff for electricity,[489] thus adversely affecting the affordability of electricity. Also, the importation of petroleum takes a large chunk of Kenya's foreign reserves, with not less than 25% of the national energy bill in Kenya being for the importation of petroleum. The amount the GoK spends in settling this bill could be used to develop other sectors of the Kenya's economy.[490]

Secondly, Kenya plans to deploy RE as part of the Kenyan rural electrification programme ("KREP"), and RE is seen as crucial to improving access to electricity for the rural population. The KREP has been re-organised so as to increase the rate of electricity access in rural areas and the use of RE.[491] The implementation of the KREP under the newly enacted *Energy Act 2019* (the 'New Energy Act') will be discussed in detail later in this chapter.

(b) Environmental sustainability

RE use will facilitate the production of environmentally friendly electricity.[492] Among other things, Kenya is under international obligations to protect its environment through the use of RE.[493] In furtherance of this obligation, Kenya has ratified a number of international agreements, including the United Nations Framework Convention on Climate Change,[494] the Kyoto Protocol,[495] and the Paris Agreement,[496] and has also introduced a number of local

[489] Republic of Kenya, *Updated Least Cost Power Development Plan* (n 41) 43, 44.

[490] Kees Mokveld and Steven von Eije, *Final Energy Report Kenya* (Netherlands Enterprise Agency, 2018) 3. According to Mwangi et al, Kenya sometimes spends not less than 55% of its foreign earnings in settling oil importation bills. See James Mwangi, Nicholas Kimani and Maina Muniafu, 'Renewable Energy Governance in Kenya: Plugging into the Grid "Plugging into Progress"' in Evanthie Michalena and Jeremy Maxwell Hills (eds), *Renewable Energy Governance: Complexities and Challenges. Lecture Notes in Energy Volume 23* (Springer Verlag, 2013) 119, 121.

[491] Abdallah et al (n 174) 50.

[492] Government of Kenya, *National Climate Change Action Plan 2013–2017* (Republic of Kenya, 2013) 36, 115.

[493] UNDP Kenya, *Environmental Sustainability, Renewable Energy & SLM* (2020) <https://www.ke.undp.org/content/kenya/en/home/ourwork/environmentandenergy/overview.html>.

[494] *UNFCCC (n 52).*

[495] *Kyoto Protocol to the United Nations Framework Convention on Climate Change*, Report of the Conference of the Parties at its Third Session, 1-11 December 1997, U.N. Doc FCCC/CP/1997/7/Add.1, 18 March 1998, Annex; Virginia Wiseman, 'Kenya Accepts Doha Amendment to Kyoto Protocol', SDG Knowledge Hub, *International Institute for Sustainable Development* (28 April 2014) <http://sdg.iisd.org/news/kenya-accepts-doha-amendment-to-kyoto-protocol/>.

[496] UNFCCC, *Paris Agreement* (n 52).

documents (e.g. the National Climate Change Action Plan[497] and the National Climate Change Response Strategy[498]). Nearly all of these agreements have diversification of energy sources to include a contribution from RE sources as a strategy. In pursuing the environmental protection objective, most importantly to mitigate greenhouse gas emissions, Kenya has put in place laws and policies to address the risks to the environment of electricity generation.[499] Kenya has pledged to reduce carbon emissions be at least 30% by the year 2030 through the use of technologies that support low carbon emissions.[500]

For these reasons, Kenya has been developing its RE resources (wind, geothermal, biomass, solar and small hydro). The potentials of these resources vary. Kenya's geothermal resources can generate between 7,000 MW and 10,000 MW of electricity, and they currently generate not less than 50% of the country's total electricity.[501] Geothermal is also one of the energy sources from which Kenya plans to generate affordable electricity. The 280 MW geothermal plant commissioned by the GoK in 2015 led to a 30% decrease in the price of electricity.[502] Regarding solar, the average solar temperature is between 4 and 6 kWh/m^2/day (the equivalent of about 300 million tonnes of oil). Kenya's grid-connected solar PV has the potential to generate around 3,801 GWh of electricity. The rural population is already taking advantage of the GoK's investments in solar energy. Annually, Kenya sells between 25,000 and 30,000 solar PV systems and an estimated 200,000 households have been able to access clean electricity through solar PV.[503]

Wind is another RE source with potential to provide electricity for millions of households. Wind speed in north-western Kenya is 9 m/s and above, while the areas along the Indian Ocean experience wind at the rate of 5 m/s.[504] With wind blowing at an average rate of 6 m/s, Kenya

[497] Government of Kenya, *National Climate Change Action Plan* (n 496).
[498] Government of Kenya, *National Climate Response Strategy* (Republic of Kenya, 2010).
[499] Karim Lalji, 'Electricity Regulation in Kenya', *Lexology* (Getting the Deal Through), 6 November 2018.
[500] Ibid.
[501] Sarkodie and Adom (n 473) 698.
[502] Mokveld and von Eije (n 494) 3.
[503] Sarkodie and Adom (n 473) 698.
[504] Kenya Renewable Energy Association, *Wind Energy* <http://kerea.org/renewable-sources/wind-energy/>.

can generate electricity for the entire country from between 15 km^2 and 20 km^2 of land area (that is, about 3% of the land area in Nairobi). Kenya has installed about 100 small wind turbines with combined capacity of 400 MW.[505] Lake Turkana, the largest wind farm in Africa, has a capacity of 310 MW from which Kenya plans to export electricity to the grid.[506] Another 40 MW of wind electricity, which could be used to supply electricity to about 4 million households, is yet to be harnessed.[507] The geographical landscape (highlands and mountainous areas) of Kenya are a major contributor to its wind potential.[508] The Ministry of Energy in 2001 designed the National Wind Atlas to attract investors who are interested in exploring Kenya's wind energy potential.[509]

Finally, small hydro in Kenya is being exploited either to export electricity to the grid or as a standalone system. Kenya's small hydro potential is around 3,000 MW, out of which Kenya is utilising only 25 MW of grid-connected hydro under various schemes.[510]

Kenya has made substantial investment towards the development of its RE resources for electricity generation.[511] In 2008, Kenya established the Geothermal Development Company to develop the country's geothermal for electricity generation.[512] In 2015 alone, 70% of the electricity generated came from RE sources (mainly geothermal and hydropower) while the remaining 30% came from fossil fuels.[513] There are plans to increase electricity generation capacity to 21,156 MW and the contribution of RE to the overall energy mix from 42% to 80%

[505] Mokveld and von Eije (n 494) 6.
[506] Sarkodie and Adom (n 473) 698; Veselina Petrova, 'Kenya's 310-MW Lake Turkana Wind Farm Delivers 1st Power to the Grid', *Renewables*, 27 September 2018 <https://renewablesnow.com/news/kenyas-310-mw-lake-turkana-wind-farm-delivers-1st-power-to-the-grid-627998/>.
[507] Republic of Kenya, *Updated Least Cost Power Development Plan* (n 41) 56; Stephen Karekezi, John Kimani and Oscar Onguru, *Draft Report on Energy Access Among the Urban and Peri-Urban Poor in Kenya* (Global Network on Energy for Sustainable Development, 2008) 12.
[508] MoEP, *National Energy and Petroleum Policy* (n 465) 58; Paul Kirai and Bijal Shah, *Target Market Analysis: Kenya's Wind Energy Market* (German Federal Ministry of Economics and Technology, 2009) 5.
[509] Kirai and Shah (n 512) 5, 9.
[510] MoEP, *National Energy and Petroleum Policy* (n 465) 49, 51.
[511] GoK, *National Climate Change Action Plan* (n 496) 27, 92.
[512] Kapika and Eberhard (n 483) 27.
[513] Osiolo et al (n 29) 119.

by 2030.[514] By that time, the total installed capacity for RE will be 8,185 MW, comprised of hydro (1,039 MW), geothermal (5,110 MW) and wind (2,036 MW).[515] All of these efforts aim to tap into the country's RE potential for electricity generation.

The legal and regulatory framework for electricity in Kenya has been fundamental to the development of RE for electricity. The thesis will now examine the legal framework for electricity in Kenya and how it has contributed to the uptake of RE.

4.2 Legal and Regulatory Framework for Electricity in Kenya

The legal framework for electricity in Kenya is a combination of law, energy policy and other regulatory documents.[516] Although this legal framework is historically biased in favour of fossil-fuel energy, it has, over the years, been applied to promote electricity generation from renewables. There is a sequential linkage between the development of law and of policy, and the development of Kenya's electricity sub-sector. This chapter will take a historical approach to considering the key law and policy in Kenya for increasing the uptake of RE in electricity, as this is the clearest method by which to demonstrate and understand the contribution of law to the development of RE. For this purpose, this thesis will examine Kenya's *Electric Power Act* (starting from the *1920 Electric Power Act*), the 2004 Sessional Paper No 4, the *2006 Energy Act,* the 2009 Least Cost Power Development Plan, the 2015 National Energy Policy, the 2016 Sustainable Energy for All Action Agenda and the *2019 Energy Act*.

[514] MoEP, *Kenya Action Agenda* (n 30) 17, 43.
[515] Ibid 43.
[516] Tigabu et al (n 492) 2, 5.

4.2.1 Electric Power Act

(a) Electric Power Act 1920

The earliest legislation for the regulation of electricity in Kenya was the *Electric Power Act 1920* (the EPA).[517] In line with the regulatory structure in the EPA, the GoK established the Kenya Power and Lighting Company Limited (KPLC) in 1922 as the first utility company in Kenya. The KPLC later merged with the Nairobi Power and Lighting Company to form the East African Power and Lighting Company (EAP&L).[518] In 1954, a new state-owned utility company, Kenya Power Company (KPC), was created from the KPLC.[519] The KPC was prior to that time a department under the management and supervision of the KPLC in charge of maintaining public-funded generating plants. The EAP&L was renamed the KPLC in 1983 following a re-organisation of the company.[520] In 1986, the EPA was repealed following the passage of a new Act, the *Revised Electric Power Act* (the Revised EPA).[521]

(b) Revised Electric Power Act 1986

The Revised EPA maintained the vertically-integrated regulatory structure that was created in the EPA.[522] The KPLC continued to be responsible for the performance of key electricity functions (that is, generation, transmission and distribution), the KPC having become moribund.[523] The monopoly of powers in favour of the KPLC over the major electricity functions affected the efficiency of service delivery. As a result of this operational inefficiency, the GoK in the mid-1990s considered a reform of the electricity sub-sector to make the KPLC

[517] Catrina Godinho and Anton Eberhard, *Learning from Power Sector Reform The Case of Kenya*, Policy Research Working Paper 8819 (World Bank Group: April 2019) 1, 9.
[518] Ibid 8.
[519] Christopher H Onyango, 'Regulatory and Competition-Related Reforms in Kenya's Power and Petroleum Sectors' (ICBE Policy Brief, TrustAfrica and the International Development Research Centre, 2013) 2; Godinho and Eberhard (n 521) 11.
[520] Kapika and Eberhard (n 483) 23–4.
[521] Electric Power Act (Revised Edition) 1986. This research did not uncover any publicly available information on why the Electric Power Act 1920 was repealed.
[522] Godinho and Eberhard (n 521) 9.
[523] Kapika and Eberhard (n 483) 23–4.

competitive.[524] In an economic paper, the GoK highlighted the government's intention to create a separate regulator for the electricity sub-sector, to unbundle electricity functions and to introduce measures that would promote private sector investment in the electricity sub-sector.[525] The GoK, consequently, repealed the Revised EPA to pave the way for a law that would accommodate the proposed changes in the economic paper. In 1997, Kenya enacted the *Electric Power Act 1997* (EPA 1997) to carry out the proposed changes in the electricity sub-sector.[526]

(c) Electric Power Act 1997

The EPA 1997 unbundled the vertically integrated structure into a horizontally integrated electricity sub-sector. Based on a recommendation from the World Bank, Kenya separated electricity regulatory and policy functions from commercial activities. The commercial activities (that is, the generation, distribution and transmission functions) were further separated and assigned to different entities.[527] In 1998, the KPC was re-launched and renamed the Kenya Generating Company Limited (KenGen).[528] The KenGen took over all public electricity-generating plants in Kenya, while the KPLC was performing the function of a bulk buyer of electricity in addition to transmission and distribution functions.[529] Although IPPs and emergency power producers were allowed to partake in the electricity generation function,[530] the electricity regime in the EPA 1997 was that of a single-buyer electricity market with KPLC as the sole off-taker of electricity.[531] For this purpose, the KPLC had electricity purchase

[524] Ibid 22.
[525] Government of Kenya, *Kenya Economic Reforms for 1996-1998: The Policy Framework Paper*, *International Monetary Fund and the World Bank* (Government of Kenya, 1996) 1, 20, 30.
[526] Ibid 22.
[527] Onyango (n 523) 2.
[528] *A Report of the Parliamentary Committee on Energy Communications and Information of Ownership and Status of the KPLC* (2010).
[529] Ministry of Energy, *Sessional Paper No 4 on Energy* (2004) 7.
[530] IPPs are private companies engaged in either conventional energy or RE pursuant to the REFiT. The emergency power producers, on the other hands, are diesel-generated electricity producers procured by KenGen to supply back-up electricity. See, Anton Eberhard, Katharine Gratwick and Laban Kariuki, 'Kenya's Lessons from Two Decades of Experience with Independent Power Producers' (2018) 52 *Utilities Policy* 37, 45.
[531] Campbell Shaun, *Energy Sector Insights: Kenya* (Future Watch Report, 2016) 6; MoEP, *National Energy and Petroleum Policy* (n 465) 22.

contracts with both the KenGen and the IPPs.[532] Following the regulatory framework in the EPA 1997, the GoK established the Electricity Regulatory Board (ERB) in 1998 as the regulator for the electricity industry. The ERB had, as part of its mandate, powers to set and review the electricity tariff, and to promote competition within the electricity industry.[533]

Although the EPA 1997 appeared to have introduced significant changes to the electricity sub-sector, certain issues were inhibiting the progress of the electricity industry. First, the regulatory structure in the EPA 1997 was complicated, with the functions of the ERB muddled with those of the Ministry of Energy. The GoK (acting through the Ministry of Energy) was performing the policy formulation and regulatory functions for the energy sector. As a result of this, the ERB could not function effectively as the electricity regulator.[534] Second, the investment environment in the EPA 1997 was not capable of attracting private sector investment. The shares of KenGen were 100% owned by the GoK, with no prospect for private sector involvement. There was also the issue of gross inefficiency in the transmission and distribution of electricity, whereby the KPLC was making losses despite the separation of electricity functions.[535]

Regarding the uptake of RE, the EPA 1997 did not contain any provisions on the use and exploitation of RE resources.[536] Apart from a little success recorded in the use of geothermal for electricity production, KenGen and the KPLC did not show any demonstrable interest in developing RE resources. What little development of geothermal energy there was governed by the provisions of the Geothermal Resources Act[537] which established the Geothermal Development Company (GDC) to promote the commercial exploitation of geothermal for

[532] Ministry of Energy, *Sessional Paper* (n 533) 7.
[533] Electric Power Act 1997 ss 119, 121(e); Onyango (n 523) 2.
[534] Ministry of Energy, *Sessional Paper* (n 533) 6; Kapika and Eberhard (n 483) 22.
[535] Godwin Wangong'u and Cornelius Kipkurui, 'The Energy Act, 2019: Opportunities to the Private Sector', *Mboya Wangong'u & Waiyaki Advocates* (28 June 2019) <http://www.lexgroupafrica.com/the-energy-act-2019-opportunities-to-the-private-sector/>.
[536] John Mutua, Dianah Ngui, Helen Osiolo, Eric Aligula and James Gachanja, 'Consumers' Satisfaction in the Energy Sector in Kenya' (2012) 48 *Energy Policy* 702, 703; Tom Owino and Tom Morton, 'The Impact of Energy Sector Reform' (2010) 4(4) *Carbon & Climate Law Review* 345, 347.
[537] Geothermal Resources Act 1982.

electricity generation, and not the EPA 1997. Although the GoK was now considering the potential of RE for electricity generation, it came to realise that the EPA 1997 could not bring about any significant changes in RE development, and that there was a need for a law that would address the non-utilisation of other RE resources. The problems in the electricity sector, and the deficiencies in the legal and regulatory regime, were outlined in a policy document known as the Sessional Paper No 4 2004.

4.2.2 Sessional Paper No 4 2004

The Sessional Paper No 4 on Energy (also known as the National Energy Policy) is Kenya's national energy policy. The Sessional Paper lays 'the policy framework upon which cost-effective, affordable and adequate quality energy services will be made available to the domestic economy on a sustainable basis'.[538] Referring to SE objectives, the Sessional Paper underscores the importance of RE in promoting 'equitable access to quality energy services at least cost while protecting the environment'.[539] The Sessional Paper identifies the deficiencies in the electricity sub-sector to include insufficient private sector investment, and poor distribution and transmission networks, among others. To address the insufficiency of private sector investment, the Sessional Paper recommended a public offering of KenGen's shares on the floor of the Nairobi Stock Exchange.[540] The Sessional Paper also recommended the privatisation or concession of idle power stations that are located in remote areas to generate more funds for investment.[541] In the area of affordability of electricity, the Sessional Paper suggested a lifeline tariff structure for domestic electricity consumers as a fair pricing methodology to favour the poor.[542] The Sessional Paper recognised the necessity of the

[538] Ministry of Energy, *Sessional Paper* (n 533) VIII.
[539] Ibid VII; Karim Lalji and Edwin Baru, 'Electricity Regulation: Kenya', *Getting the Deal Through* (Online), November 2017 <https://gettingthedealthrough.com/area/12/jurisdiction/44/electricity-regulation-kenya/>.
[540] Ministry of Energy, *Sessional Paper* (n 533) IX, 56.
[541] Ibid IX, 39, 55, 8.
[542] Karekezi et al (n 511) 24.

increased uptake of RE for electricity generation, and recommended incentive packages to boost investment in RE and other off-grid electricity generation.[543]

The Sessional Paper promoted a shift from fossil-fuel energy in favour of RE for a SE system.[544] In terms of the law, the Sessional Paper recommended the harmonisation of the EPA 1997 and the Petroleum Act into a single law. The harmonisation was to ensure prudential regulation and control of Kenya's energy resources.[545] To implement these proposals, most importantly the harmonisation of laws, in 2006 the GoK enacted the Energy Act.

4.2.3 Energy Act 2006

The passage of the *Energy Act 2006* saw, for the first time in Kenya, the enactment of a law with specific provisions for the promotion of RE for electricity generation and other uses. The *Energy Act 2006* repealed the EPA 1997 and the Petroleum Act.[546] The *Energy Act 2006* aimed to increase investment in RE and its contribution to the electricity mix. Between 1999 and 2014, not less than 65% of investment in the Kenya's energy sector was devoted to the development of RE resources (biomass, hydro, geothermal, solar and wind).[547] The relevant provisions of the *Energy Act 2006*, and how they have contributed to the uptake of RE for SE in Kenya, will be explained below.

(a) Electricity reform

The *Energy Act 2006* resulted in major reform to the electricity sub-sector. The reform targeted four key areas: (a) policy formulation; (b) restructuring of power utilities; (c) establishment of an effective regulatory framework; and (d) the KREP.[548]

Policy Formulation

[543] Ministry of Energy, *Sessional Paper* (n 533) 42, 44, 59.
[544] Peter Kimuyu, John Mutua and John Wainaina, *Role of Renewable Energy in Promoting Inclusive and Sustainable Development in Kenya* (European Report on Development, 2012) 25.
[545] Ministry of Energy, *Sessional Paper* (n 533) 45.
[546] Energy Act 2006 s 123(1).
[547] Pueyo (n 43) 87.
[548] Abdallah et al (n 174) 48.

The *Energy Act 2006* separated the policy formulation function from the electricity regulatory function. The GoK, acting through the MoE&P, remains the policy maker for the energy sector. The ministry is in charge of policy and strategic development in the energy sector including electricity.[549] The MoE&P has five directorates, of which one is specifically responsible for the development of RE.[550] Part of the mandate of the RE directorate is the provision of clean, affordable and sustainable energy for all, and the provision of an enabling environment for other stakeholders.[551] To further increase the uptake of RE, the MoE&P set the objective of generating not less than 70% of the country's electricity from RE.[552] It is in line with this obligation, and the need to provide sustainable and affordable electricity that meets development goals, that the ministry formulates policies for the energy sector. Among these policies, some specifically target diversification of electricity generation sources to promote the security of supply and increased electricity access.

Electricity Regulation

The *Energy Act 2006* dissolved the ERB and replaced it with the Energy Regulatory Commission (ERC) 'as a common energy sector regulator'.[553] There is a marked difference between the ERB in the EPA 1997 and the ERC in the Energy Act 2006. The ERB was responsible only for the electricity sub-sector, while another body oversaw the petroleum industry. The powers of the ERC, on the other hand, extend over the entire energy sector (including electricity). The ERC, therefore, has a broader mandate than the ERB. Among other functions, the ERC negotiates the PPAs between the KPLC and the power producers, and oversees pricing of electricity. Crucially, in performing its functions, the ERC is operationally

[549] Energy Act 2006 s 111(1); Kenyans, *Ministry of Energy and Petroleum* (2020) <https://www.kenyans.co.ke/government/ministry-energy-petroleum>.

[550] Kenya Pipeline Company Limited, *Ministry of Energy and Petroleum* (2017) <http://www.kpc.co.ke/moep/>; Ministry of Energy, *Background* (2018) <http://energy.go.ke/background/>.

[551] Ministry of Energy, *Our Vision and Mission* (2018) <http://energy.go.ke/vision-and-mission/>; Climate Investment Funds, *Investment Plan for Kenya* (2017) 17 <https://www.climateinvestmentfunds.org/sites/cif_enc/files/kenya_investment_plan_mtg_document_0.pdf>.

[552] Mokveld and von Eije (n 494) 10.

[553] Energy Act 2006 s 4; Ministry of Energy, *Sessional Paper* (n 533) 55.

independent. This is because it does not depend on the government for finances, but rather finances its activities from the levies imposed on electricity licenses and tariffs.[554] The ERC works in conjunction with the Minister in drafting the national energy policy.[555]

Restructuring of Power Utility Companies

The *Energy Act 2006* liberalised the electricity sub-sector and fully unbundled the electricity functions. For the first time in Kenya, the private sector came to own part of the equity shares of the formerly wholly state-owned electricity companies, when, in accordance with the Sessional Paper, the GoK divested part of its shares in the KenGen and offered them to the general public.[556] The GoK also sold part of the shares in the KPLC to private investors, while retaining 50.1% of the shares.[557]

Following private sector acquisition of shares in KenGen, private investors (the IPPs) are now involved in the provision of investment funds for electricity generation in Kenya.[558] The IPPs play important roles in RE development by involving themselves in RE projects as well as carrying out feasibility studies of RE resources as a basis for negotiating power purchase agreements (PPAs) with the KPLC.[559] Kenya's IPPs are regarded as the most organised IPPs in sub-Saharan Africa, accounting for not less than 30% of the total installed electricity capacity and contributing not less than 28% of grid electricity in Kenya.[560] With about 52 ongoing power projects, the IPPs' contribution to the power sector is expected to reach 60% by the end of 2020.[561] By so doing, Kenya's electricity sub-sector is able to attract a mix of public and private sector funds for electricity generation, a factor that has helped to increase the total

[554] Mokveld and von Eije (n 94) 10.
[555] Ibid.
[556] MoEP, *National Energy and Petroleum Policy* (n 465) 67; Eberhard and Gratwick (n 485) 13.
[557] Kapika and Eberhard (n 483) 24, 26.
[558] Power Africa, *Annual Report* (2017) <https://www.usaid.gov/sites/default/files/documents/1860/PA_FINAL_508c.PDF>.
[559] Ministry of Energy, *FiT Policy* (n 491) s 5.
[560] Eberhard, Gratwick and Kariuki (n 534) 37, 46; Anton Eberhard, Katharine Gratwick, Elvira Morella and Pedro Antmann, 'Independent Power Projects in Sub-Saharan Africa: Investment Trends and Policy Lessons' (2017) 108 *Energy Policy* 390, 399.
[561] Republic of Kenya, *Kenya Vision 2030* (n 41) 8.

installed electricity capacity.[562] In regards to transmission, a new state-owned utility company, Kenya Transmission Company Limited (KETRACO), took over the function of electricity transmission from the KPLC.

Another important aspect of the reform was the establishment of the Energy Tribunal.[563] The Tribunal handled all appeals arising from the decisions of the ERC in disputes relating to licensing processes.[564] The existence of the Tribunal reinforced private sector confidence in the resolution of disputes in the electricity sub-sector.[565]

Overall, the reform brings about a competitive electricity sub-sector by bringing together public and private participants/entities in the electricity sector. The retention of the policy formulation function, coupled with the GoK's involvement in electricity generation and distribution, allows for the effective dissemination of the government policies. Further, by assigning electricity functions to different entities, Kenya achieved an appreciable improvement in electricity generation, leading to an increase in the country's installed electricity capacity.[566] By allowing the involvement of government and the private sector in the performance of the key electricity function, Kenya has been able to attract a mixture of investment types for its electricity expansion. How some of these have worked for Kenya will be discussed further in Chapter 5 of this thesis.

Rural Electrification Programme

The *Energy Act 2006* re-organised the KREP and provided for the establishment of the Rural Electrification Authority ('the Authority') to oversee the activities of the KREP.[567] The functions of the Authority, which was established in 2007, include developing and updating the rural electrification master plan. For the execution of its projects, the Act establishes a

[562] Eberhard, Gratwick and Kariuki (n 534) 40.
[563] Energy Act 2006 s 107.
[564] Ibid s 26.
[565] Onyango (n 523) 2; Owino and Morton (n 540) 346; Eberhard and Gratwick (n 485).
[566] Kenya Electricity Generating Company (KenGen), *KenGen Right Issue 2016: Information Memorandum* (2016) 24.
[567] Energy Act 2006 s 66.

dedicated fund, the Rural Electrification Programme Fund (REPF), under the control of the Authority for the KREP.[568] The GoK applies the REPF to support the use of renewables for electricity generation and access in line with the objectives of the KREP.[569] Detailed discussion of the KREP will be undertaken later in this chapter.

(b) Statutory Obligation to Develop RE

The *Energy Act 2006* imposed an obligation to develop the use of RE on the Minister, the ERC and the Authority.[570] The Minister is obligated by law to promote the development and use of RE technologies either for power generation or transportation, while the ERC is required to promote the use of RE resources.[571] The Authority, on its part, is required by law to promote the use of RE in providing electricity access in Kenya, taking into consideration the peculiar needs of each area such as the possibility of using electricity for irrigation.[572]

An important point about the RE obligation in the *Energy Act 2006* is the distinction between RE resources and RE technologies, as highlighted above. Whilst the obligation of the Minister is in respect of RE technologies, the ERC is responsible for the development of RE resources. This distinction between resources and technologies is consistent with the definition of RE in the NREEEP.[573] However, in the case of the Authority, the operative words are '*renewable energy sources*' (as opposed to either RE technologies or RE resources). It can, therefore, be argued that the obligation of the Authority covers both RE resources and the technologies based on these resources, since there is no express mention of either resources or technology in the relevant provisions. By imposing the obligations this way, the *Energy Act 2006* removes any ambiguity that may arise in the performance of RE functions among the regulators, and consequently makes accountability possible.

[568] Energy Act 2006 s 79(1). Sources of fund for the rural electrification program are the electricity sales levy, other charges, money appropriated by the Kenyan Parliament, etc. See Energy Act 2006 s 79(2).
[569] Ibid ss 66(1), 67, 79, 103(2)(h).
[570] Ibid ss 67(d), 103(1); Kirai and Shah (n 512) 7–8.
[571] Energy Act 2006 ss 5(a)(iii), 103(1); Kirai and Shah (n 512) 7–8.
[572] Energy Act 2006 s 67(d).
[573] See pp. 21-2.

(c) Renewable Energy Feed-in Tariff (REFiT)

Kenya has had a REFiT since 2008. A REFiT is a policy mechanism that imposes on an off-taker of electricity the obligation to buy renewable electricity on a priority basis and at a predetermined tariff.[574] A REFiT operates as a financial burden-sharing mechanism by ensuring that any additional costs for renewable electricity are distributed among electricity consumers and the off-takers.[575]

Through the REFiT, the GoK has been able to attract investment in the electricity sub-sector.[576] By mandating electricity GenCos to purchase renewable electricity at a predetermined price, the REFiT guarantees market stability and investment security for electricity. The tariff under Kenya's REFiT is guaranteed for a period of 20 years, subject to review every 3 years.[577] Except for solar plants, in which the off-taker can recover 85% of the tariff, 70% of the tariff is to be recovered from consumers. This way, the full financial burden of the REFiT tariff is not borne by electricity consumers alone. The operation of the REFiT following the passage of the Energy Act 2019 will be discussed later in this chapter.

Shortcomings of the Energy Act 2006

Despite its achievements, it became apparent that the *Energy Act 2006* was not without shortcomings. First, the Energy Act 2006 maintained a monopoly, in regard to some functions, in favour of the state utility companies. Although the IPPs are involved in electricity generation, they are not permitted to sell bulk electricity to consumers other than the KPLC.

[574] Ministry of Energy, *FiT Policy* (n 491) s 68.

[575] Renewable Energy Ventures and Meister Consultants Group, *Powering Africa through Feed-in Tariffs: Advancing Renewable Energy to Meet the Continent's Electricity Needs* (World Future Council, Heinrich Böll Stiftung and Friends of the Earth England, Wales & Northern Ireland, 2013) 16.

[576] Norton Rose Fulbright, *Investing in the African Electricity Sector* (2013) <http://www.nortonrosefulbright.com/knowledge/publications/100605/investing-in-the-african-electricity-sector>.

[577] Ministry of Energy, *FiT Policy* (n 491) s 75.

Since the KPLC is the only distribution company in Kenya, the IPPs do not enjoy the benefit of being offered competitive purchase prices by the off-taker.[578]

A monopoly also exists in the operation of the KREP. Among other things, the KREP aims to facilitate the entry of independent power distributors to bring electricity access to the rural population, particularly in remote areas. Since there is no other company with the responsibility for electricity distribution, the KPLC is still in charge of electricity distribution and transmission in rural areas. The KETRACO, which is ordinarily charged with the function of electricity transmission, is not the owner of the existing transmission lines in remote areas. This makes the KPLC more powerful than the other state utility companies.[579]

Overall, the positive contributions of the *Energy Act 2006* to the development of RE outweighed its drawbacks. With specific provisions on the uptake of RE, electricity generation from RE sources in Kenya witnessed significant development, although overall electricity remained a comparatively small percentage of total energy consumption. Having said this, certain events occurred after the passage of the *Energy Act 2006* which necessitated the need for amendments to the Act. Three events are relevant to the discussion here. The first is the enactment of the new Constitution of Kenya in 2010, which, coming four years after the *Energy Act*, meant that important provisions of the Constitution on the development of RE resources were not captured in the Energy Act 2006. One of these provisions is the affirmation of two layers of control over energy resources in Kenya. In addition, the provisions of the Constitution mandating the GoK to promote SD of natural resources and the environment are not captured in the *Energy Act 2006*.[580]

Second, the GoK in 2008 approved a long-term economic development blueprint tagged 'Vision 2030'. The energy and economic development objectives of Vision 2030 are also not

[578] Omolo Beldine, *Competition in Kenya's Electricity Sector* (1st Annual Competition and Regulation in Network Industries Conference, Brussels, Belgium, 29 November 2008) 4.
[579] Njiraini Muchira, 'County Governments to Unlock Kenya Power's Grip on Electricity Distribution', *The Daily Nation*, 24 July 2012.
[580] Constitution 2010 s 69. See also Constitution 2010, sch 4, Items 8, 21, 31.

reflected in the *Energy Act 2006*. Closely related to Vision 2030 on electricity generation is the 2011 long-term electricity policy termed the Least Cost Power Development Plan 2011, which is described below. The third, and more minor, reason for the proposed changes to the *Energy Act 2006* was the change in the designation of federal ministers to 'cabinet secretaries'.[581] With the new nomenclature, the Minister of Energy and Petroleum is now referred to as the Cabinet Secretary for Energy and Petroleum. To incorporate these changes, in 2015, the GoK released the National Energy and Petroleum Policy (NEPP), discussed below.

4.2.4 Updated Least Cost Power Development Plan 2011

The drought that started in the 1990s affected the capacity of Kenya's hydro plants, hence the need to introduce stopgap measures.[582] The LCPDP is a long-term development plan to increase electricity generation through optimal development of energy resources.[583] It outlines Kenya's approach to determining the combination of electricity generation sources that will lead to electricity generation at the least cost. The LCPDP prioritises some of Kenya's RE resources for electricity generation and provides the basis for pursuing additional electricity targets.[584] RE (especially geothermal) and coal were identified as among the electricity generation sources from which Kenya can generate electricity at the least costs.[585] The idea is that the addition of coal to RE has the potential to limit the overall cost of electricity generation and the retail price.[586] Based on the LCPDP projection, Kenya plans to generate 20,156 MW of electricity by 2030 with an 80% contribution from RE sources.[587]

[581] Constitution 2010 s 152.
[582] Kapika and Ebenhard (n 483) 21.
[583] Republic of Kenya, *Updated Least Cost Power Development Plan* (n 41) 13.
[584] Peter Newell and Jon Phillips, 'Neoliberal Energy Transitions in the South: Kenyan Experiences' (2016) 74 *Geoforum* 39, 43.
[585] Republic of Kenya, *Updated Least Cost Power Development Plan* (n 41) 61, 98; Muchira, 'Coal in Kenya' (n 480).
[586] Lukas Kahlen, Marie-Jeanne Kurdziel, Thomas Day and Tessa Schiefer, *The Role of Geothermal and Coal in Kenya's Electricity Sector and Implications For Sustainable Development* (New Climate Institute, 2019) 1.
[587] MoEP, *Kenya Action Agenda* (n 30) 43.

4.2.5 National Energy and Petroleum Policy 2015

Notwithstanding the achievements of the *Energy Act 2006*, the NEPP sets out the GoK's plans to further increase the rate of access to affordable energy and the development of indigenous RE resources for electricity generation.[588] In line with these objectives, the NEPP proposes a new regulatory agency for the development of RE in Kenya and a new fund to support a stable investment climate for RE initiatives.[589] Consequently, the GoK introduced an Energy Bill to the Kenyan Parliament in 2015. In 2017, the Energy Bill was passed by the Kenyan Parliament and sent to the President for assent. The President, however, refused to assent to the Bill on the grounds that the penalties for irregular supply of electricity provided for in the Bill would expose the GoK to more liabilities.[590] The Bill has now been passed by the Parliament as the *Energy Act 2019*. One important event that took place while the Energy Bill was pending before the Kenyan Parliament was the adoption of the United Nations' SE initiative by Kenya. Kenya subscribed to this initiative by approving the Sustainable Energy for All Action Agenda (the 'Sustainable Agenda') in 2016. This will be discussed briefly before the discussion of the *Energy Act 2019*.

4.2.6 Sustainable Energy for All Action Agenda 2016

The Sustainable Agenda embodies Kenya's commitment to the international SD agenda. It highlights the goals of the energy sector towards the realisation of 100% electrification access and 80% RE in the energy mix by 2030.[591] In the area of electricity generation, there is a projection of 65% RE in the Sustainable Agenda, with the installed power capacity projected at 14,676 MW by 2030.[592] It emphasises the development of RE as a way of keeping to the

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[588] Europa EU, *Country: Kenya* (EuropeAid/134039/C/SER/Multi, European Union, 2015) <https://europa.eu/capacity4dev/file/30320/download?token=W1aaFPuw>.

[589] MoEP, *National Energy and Petroleum Policy* (n 465) 13, 16, 109.

[590] Kaplan & Stratton, 'A Year in Review – Looking Back at the Legislative Developments of 2017', *Kaplan & Stratton Newsletter*, February 2018 <http://www.kaplanstratton.com/wp-content/uploads/2018/02/A-Year-in-Review-Newsletter.pdf>.

[591] MoEP, *Kenya Action Agenda* (n 30) 1.

[592] Ibid 16, 24.

principles of SD.[593] To ensure the realisation of the SD agenda, the Sustainable Agenda proposes the establishment of Sustainable Energy Finance to finance clean energy and the establishment of a Sustainable Energy for All Advisory Board to advise the GoK on the uptake of RE.[594]

4.2.7 Energy Act 2019

The New Energy Act is an updated and consolidated law on Kenya's energy sector. The New Energy Act repeals the Energy Act 2006, the Nuclear Electricity Board Order No 131 of 2012 and the Geothermal Resources Act.[595] Some of the provisions of the New Energy Act as they relate to electricity and the development of RE in particular are considered below.

(a) Electricity Reform

The New Energy Act introduces some changes to the existing electricity regime with respect to the operation of the electricity distribution networks. For the first time, new players are now involved in the distribution of electricity by permitting other entities to sell off-grid. According to Wangong'u and Kipkurui:

> The most important change introduced by the Act is in distribution of electricity. The ability to sell off grid will introduce new players who will take advantage of the high industrial and institutional demand as well as dissatisfaction with the aging monopoly. Purchase of power, retailing, metering, selling and billing by private power companies, it is expected, will spur massive growth in this industry. These provisions are in line with international industry standards and practices. This will attract more capital from the private sector investors and increase confidence in Kenya's energy sector as the Act brings with it certainty and modernity.[596]

The involvement of other entities in electricity distribution will reduce and/or remove the monopoly that the KPLC has enjoyed, and make the distribution function more competitive. The Act requires potential distribution entities to obtain a licence issued by the Energy and

[593] Ibid 5.
[594] Ibid 66, 67.
[595] Energy Act 2019 s 224(1).
[596] Wangong'u and Kipkurui (n 539).

Petroleum Regulatory Authority (EPRA).[597] In addition, all contracts for the provision of transmission and distribution networks for electricity in Kenya are to be submitted to the EPRA in a format approved by the Cabinet Secretary for Energy.[598]

(b) New Regulators

The New Energy Act replaces the ERC with the EPRA as the regulator for the energy sector.[599] Except the refining, importation and exportation of crude oil, and licensing of nuclear facilities, which have been excluded from its functions, the EPRA powers cover all aspects of energy.[600] The GoK, acting through the Cabinet Secretary, retains the policy formulation functions. The New Energy Act imposes on the Cabinet Secretary the obligation to promote the use and development RE technologies. In discharging this obligation, the Cabinet Secretary is expected to formulate a national strategies for research in RE as well as providing an enabling framework for the sustainable production and distribution of RE.[601] The Act mandates the Cabinet Secretary to, within 12 months of commencement, prepare an RE resources map and inventory.[602] The preparation of the RE resources map and inventory is expected to pave the way for the extensive utilisation of Kenya's RE resources to meet the energy needs of the people.[603]

With respect to RE and the KREP, the New Energy Act establishes two bodies: (a) the Rural Electrification and Renewable Energy Corporation (REREC);[604] and (b) the Renewable Energy Resources Advisory Committee (RERAC).[605] The REREC replaces the REA as the coordinator

[597] Energy Act 2019 ss 138(5), 139, 151(1), 163(2); David Herbling, 'Kenya Power May Lose Distribution Monopoly with New Law', *Bloomberg News*, 4 July 2018 <https://www.bloomberg.com/news/articles/2018-07-04/kenya-power-may-lose-distribution-monopoly-with-new-law>.
[598] Energy Act 2019 s 163(1).
[599] Ibid s 9.
[600] Ibid s 10(a)(i), (ii).
[601] Ibid s 75(1), (2).
[602] Ibid s 74.
[603] Mukuha Njau, Shah Paras and Field Rainbow, 'New Energy Act Embraces Renewable Energy', *Bowmans*, 2 May 2019 <https://www.bowmanslaw.com/insights/oil-gas/new-energy-act-embraces-renewable-energy/>.
[604] Energy Act 2019 s 43.
[605] Ibid s 76.

for the KREP.[606] Unlike the REA, the REREC has expanded powers and functions that now explicitly cover the development and use of RE resources for the KREP. The REREC's mandates include the establishment of a framework for the sustainable production and utilisation of RE resources. In developing RE for use by local people, the New Energy Act mandates the REREC to apply the principle of equity.[607]

The REREC is required to establish a framework for collaboration with the county governments, to conduct feasibility studies and to maintain data for the use of developers of RE.[608] The Act expands the powers of the REREC so as to promote the uptake of RE in addressing electricity access. Following the expansion of the powers of the REREC (compared to the Authority), the New Energy Act expands the sources of funding for the REREC. In addition to the REPF, the REREC now has access to the following funds: interest from bank deposits, money appropriated by the Kenyan Parliament and revenue from other sources (e.g. donations).[609] Further, the Act permits the REREC to source additional funding for the KREP and RE,[610] and to support the setting up of energy centres in the counties.[611] This will enable it to raise substantial funds to invest in the program and for the deployment of renewable electricity.

The RERAC, on the other hand, is an advisory body responsible for advising the Cabinet Secretary on the use and development of RE. The RERAC advises the Cabinet Secretary on the following five areas: (a) criteria for allocating RE resources; (b) licensing of RE resources areas; (c) development of multipurpose projects (e.g. dams and reservoirs for power generation); (d) management of water and catchment areas; and (e) management and development of RE resources.[612]

[606] The rural electrification program will be discussed in detail later in this chapter.
[607] Energy Act 2019 s 44 (g), (i).
[608] Ibid s 44.
[609] Ibid s 53(1).
[610] Ibid s 44(1)(c).
[611] Ibid s 44(1)(f).
[612] Ibid s 76(4).

The Energy and Petroleum Tribunal (EPT) was also established to replace the Energy Tribunal, with wider jurisdiction.[613] In the Energy Act 2006, the Energy Tribunal only heard appeals against the decisions of the ERC.[614] Whereas the EPT in the New Energy Act, in addition to the appellate jurisdiction over the decisions of the EPRA, has original civil jurisdiction in matters between licensees, or between a licensee and a third party.[615] The expansion of the jurisdiction of the EPT will further reinforce investors' confidence in the ability of the energy sector to resolve electricity disputes.

(c) Ownership of Renewable Energy

In line with Kenya's Constitution, the New Energy Act vests ownership of energy resources in or under any land in Kenya in the national government, that is, the GoK.[616] The Act permits the GoK to grant a licence for the use and exploitation of such RE resources.[617] The Act sets out the modalities for collaboration between the national government and the county governments in Kenya on energy matters through the establishment of energy centres in the counties.[618] The rationale behind the centralisation of ownership of RE resources is to ensure that uneven energy resources among the counties are developed 'for the benefit of all Kenyan people and not just the regional county governments and communities where the resources are located'.[619]

(d) Energy Policy

For the first time in Kenya, the law provides direction on the implementation and review of Kenya's national energy policy. The New Energy Act mandates the Cabinet Secretary to publish the national energy policy, which is to be reviewed every five years. The Cabinet

[613] Ibid s 25.
[614] Energy Act 2006 s 89.
[615] Energy Act 2019 s 36(3), (4); Beatrice Nyabira and Martin Githua, 'Highlights of the Energy Act, 2019', *DLA Piper Africa (Insights)* (16 May 2019) <https://www.dlapiperafrica.com/en/kenya/insights/2019/highlights-energy-act.html>.
[616] Kariuki Muigua, *Access to Energy as a Constitutional Right in Kenya* (2013) <http://kmco.co.ke/wp-content/uploads/2018/08/Access-to-Energy-as-a-Constitutional-Right-in-Kenya-NOVEMBER-2013.pdf>.
[617] MWC Legal, *Review of the Energy Act 2019* (13 July 2019) <https://mwc.legal/review-of-the-energy-act-2019/>.
[618] Wangong'u and Kipkurui (n 539).
[619] Penninah Munyaka, 'Highlights of Kenya's Energy Act 2019', *Rödl & Partner*, May 2019, 12.

Secretary is also required to submit a report on the implementation of the national energy policy not later than three months after the end of every financial year.[620] In addition, the Cabinet Secretary is to implement an integrated energy plan in respect of RE, coal and electricity as a means of delivering energy services at the least cost.[621] By the integrated energy plan, every county is required to submit its energy plan vis-à-vis its energy requirements to the Cabinet Secretary. Energy service providers are also required to submit energy plans to the Cabinet Secretary. Following the submission of the energy plan, the Cabinet Secretary is obligated by law to consolidate the county governments' energy plans and the ones submitted by the energy service providers into a coherent integrated national energy plan, which is to be reviewed every 3 years.[622] Prior to the passage of the New Energy Act, the implementation and review of Kenya's national energy policy was a prerogative of the Minister for Energy, since there was no provision for the review of Kenya's energy policy in any law.

The New Energy Act requires the Cabinet Secretary to create an inventory map of RE resources. The inventory map is significant in the sense that it will serve as an explanatory note for prospective RE investors in preparing feasibility studies.[623] The Act also promotes collaboration between the national government and the county governments on matters relating to national energy policy. As well as establishing energy centres in the counties, the Act requires the county governments to set up funds for the promotion of energy use and conservation in each county.[624] In the area of electricity access, the New Energy Act imposes on the GoK an obligation to facilitate affordable electricity services to all Kenyans.[625] Consequently, the Cabinet Secretary is to implement strategies that will ensure that every household in Kenya has access to electricity by 2030.[626]

[620] Energy Act 2019 s 4(2).
[621] Ibid s 5(1).
[622] Ibid s 5(4).
[623] Munyaka (n 623) 12.
[624] Energy Act 2019 s 44(1); Wangong'u and Kipkurui (n 539).
[625] MWC Legal (n 621).
[626] Ibid.

(e) Prioritisation of Funding and Promotion of Energy Investment

Prioritisation of funding is another important provision in the New Energy Act. The Energy Act establishes a fund known as the Consolidated Energy Fund (CEF) to, among other things, promote RE initiatives and for the construction of energy infrastructure in Kenya.[627] One of the sources of funding for the CEF is the money recovered as proceeds of crimes in the energy sector. This means that energy funds that have been misappropriated will find their way back to the energy sector, rather than being used for other purposes based on the discretion of the government. This fund is in addition to the REPF. Also, the New Energy Act mandates the county governments to establish a fund specifically to promote efficiency in the use and application of energy.

(f) Promotion of Energy Investments

The New Energy Act seeks to promote investment in energy infrastructure. For this purpose, the Act mandates the government to facilitate the acquisition of land for the development of energy infrastructure in accordance with the law. In furtherance of the mandate, the Act empowers the Cabinet Secretary to compulsorily acquire any land if satisfied that the land is required for the purposes of energy infrastructure or connected purposes.[628] The New Energy Act is, however, silent on payment of compensation for land that is compulsorily acquired under the Act. The only reference to compensation for land in the New Energy Act is where damage occurs in the process of ascertaining whether or not a land will serve an intended purpose.[629] However, a careful consideration of the provisions of section 177 would suggest that a licensee of land that is compulsorily acquired is still liable to pay compensation to the land owner(s). The said provisions impose on a licensee the liability to pay compensation to the owner or occupier of land for damages or loss arising from the exercise of the powers of the

[627] Energy Act 2019 s 216(1).
[628] Ibid s 179; MWC Legal (n 621).
[629] Energy Act 2019 s 172.

EPRA, for any wrongful proceedings in the execution of the provisions of the New Energy Act or for damage caused to any energy infrastructure.

(g) Support Mechanisms for Renewable Energy

As stated earlier, Kenya has had a REFiT since 2008, but it was not originally introduced or implemented through an Act of Parliament. For the first time in Kenya, the REFiT, as well as its revisions, is contained in an Act of the Parliament, namely, in the New Energy Act.[630] There are four objectives of the REFiT in the New Energy Act. First, the REFiT will serve as a catalyst for electricity generation from RE sources. Second, the REFiT will facilitate local generation and distribution of electricity from RE. By allowing local distribution of electricity, electricity GenCos can now bypass the national grid, and by so doing reduce transmission losses that are associated with the national grid.[631] Third, the REFiT will stimulate uptake of RE technologies. Lastly, the REFiT will serve as a mechanism for reducing greenhouse gas emissions by promoting less reliance on non-RE sources in favour of RE sources.[632] Reducing greenhouse gas emissions, an environmental issue, will help in actualising one of the cardinal objectives of SE in Kenya. These objectives are in tandem with Kenya's SE agenda on the use of RE.[633]

Matters relating to the duration of the REFiT approval, tariffs to be paid for distribution, priority of purchase and so on are now the functions of the Cabinet Secretary.[634] In discharging these functions, the Cabinet Secretary is to be guided by (a) the objectives of the REFiT; (b) sustainability of RE resources; (c) the energy policies of Kenya; and (d) the need for fair competition and transparency.[635] Having the REFiT clearly recognised in the law has some advantages. First, it makes the application and enforcement of REFiT possible. Secondly,

[630] Ibid s 91.
[631] Ibid s 91(b).
[632] Ibid s 91(d).
[633] See p. 89.
[634] Energy Act 2019 s 91(2).
[635] Ibid s 91(3).

assigning the implementation of the REFiT to the Cabinet Minister rather than to a regulator will minimise conflict of functions among the regulators, since the Cabinet Secretary also formulates policies for the energy sector.

Apart from the REFiT, the New Energy Act also provides for net metering as a support mechanism for RE.[636] Under the net-metering system, an electricity consumer who owns a power generator of 1 MW capacity and below may enter into a net-metering agreement with an electricity distribution licensee or retailer. In the Energy Act 2006, there was no provision for net metering; it was merely a voluntary initiative of the electricity regulator to promote RE for electricity generation, which made the application of the system difficult.

In addition to the REFiT and net metering in the New Energy Act, there are other support mechanisms in other areas of law which have been applied to promote electricity from RE sources.[637] These other mechanisms existed before the passage of the New Energy Act. The first one is the RE concession. A concession, as an economic tool, allows a private sector company to offer services with reduced competition from rival companies.[638] It helps in guaranteeing exclusivity as well as increasing the service provider's ability to attract more finance.[639] In 2015, the GoK, through the then ERC, granted Powerhive East Africa a concession that allowed it to develop and operate solar mini-grids in some villages.[640]

Kenya, in addition, applies fiscal and economic incentives to promote RE investment and facilitate electricity access, which is now regarded as a constitutional right. The application of

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[636] Ibid s 162(2).

[637] UNEP FI (n 312) 14.

[638] Renewable Energy Policy Network for the 21st Century, *Renewable 2017 Global Status Report* (Paris, 2017) 217.

[639] Ministry of Energy and Petroleum, *Current Activities and Challenges to Scaling Up Mini-Grids in Kenya* (Republic of Kenya, 2016) 3; RIK, 'Powerhive Subsidiary Becomes First Private Utility in Kenya's History to be Licensed to Sell Electricity to the Public', *Powerhive* (7 May 2015) <https://powerhive.com/powerhive-subsidiary-becomes-first-private-utility-in-kenyas-history-to-be-licensed-to-sell-electricity-to-the-public/>.

[640] World Bank, *International Development Association Project Appraisal Document on a Proposed Credit in the Amount of Eur 133.8 Million (US$150 Million Equivalent) to the Republic of Kenya for an Off-Grid Solar Access Project for Underserved Counties* (Report No PAD2008, 2017) <http://documents.worldbank.org/curated/en/212451501293669530/text/Kenya-off-grid-PAD-07072017.txt>; MoEP, *Current Activities and Challenges* (n 622) 3, 10.

fiscal policy as a support mechanism for RE in Kenya 'is based on the need to create a sustainable balance between fiscal revenue generation and to ensure access to modern energy services by the low income segments of the population at reasonable prices'.[641] The import duty on RE equipment imported into the country is waived under the value-added tax exemption and there is also no import duty for power construction plants.[642] A major condition to be fulfilled under the *Value-Added Tax Act 2013* (as amended) is that the owner of the power-generating plant must plan to supply electricity to the national grid.[643] There is also a withholding tax exemption on interest paid on loans obtained specifically for projects in the energy sector including loans on transmission lines. Any instruments executed in relation to such loans are also exempted from stamp duty.[644] An RE project company investing in a transmission network will qualify for these exemptions as it will be deemed to be investing in the energy sector. In addition, any payments made to non-resident contractors for services rendered under a contract are exempted from paying withholding taxes. All of these taxes aim to promote widespread use of RE technologies in Kenya.[645]

The GoK also issues letters of comfort/credit to IPPs[646] and has introduced a number of business models such as the M-KOPA. Through the M-KOPA business model, GoK has made affordable solar-powered lighting available to the rural populace on a pay-as-you-go basis.[647] There were plans to raise about US$20 million to fund the expansion of this scheme from about fifty thousand homes in 2016 to over one million homes in 2018.[648] At the regional level, there is the East African Community import duty exemption agreement under which import duty is

[641] MoEP, *National Energy and Petroleum Policy* (n 465) 17.
[642] Climate Investment Funds (n 555) art 16, 4.
[643] Mokveld and von Eije (n 494) 31.
[644] Lalji (n 503).
[645] Karekezi et al (n 511) 24.
[646] The difference between a letter of credit and a letter of comfort lies in the fact that, while the KPLC issues a letter of credit, it is the GoK that issues a letter of support to cover political risks. Anjarwalla & Khanna, 'Power Sector: Kenya Guide' (Power Guide Brochure, 2017) 3, 4 <https://www.africalegalnetwork.com/wp-content/uploads/sites/22/2017/06/Anjarwalla-Khanna-Power-Sector-Kenya-Guide.pdf>; Power Africa, *Investment Brief for the Electricity Sector in Kenya* (2014) 4 <https://www.usaid.gov/sites/default/files/documents/1860/Kenya%20_IG_2015_05_03.pdf>.
[647] MoEP, *Kenya Action Agenda* (n 30) 33.
[648] Ibid.

waived for solar and wind energy technology equipment.[649] All of these mechanisms are geared towards the provision of affordable electricity in Kenya.

(h) Other Innovations

Every electricity GenCo is required to submit technical reports about its generating plants, including detailed electricity proposals, to the EPRA.[650] The reports will help to promote the environmental sustainability of electricity projects in Kenya. Last but not least, every entity that is carrying out any undertaking under the New Energy Act is required to comply with the local contents law. To do this, the entity will have to submit annual and long-term local content reports to the EPRA for approval.[651]

From the Electric Power Act to the Energy Act, Kenya has been able to establish a set of provisions to undertake power sector reform: horizontal and vertical unbundling of power utilities, establishment of an independent regulator, private sector participation and competition in power generation.[652] The reform has led to the emergence of two publicly listed companies in the electricity sub-sector (the KPLC and the KenGen) which has enabled Kenya to raise funds from the public for the expansion of electricity generation.[653] The reform also introduces changes to the ownership and governance structure among the electricity entities, and provides a conducive regulatory environment for the private entities to invest in the electricity sub-sector. The IPPs fully participate in the execution of RE projects and the application of RE for the KREP, a factor that has contributed to the uptake of RE. They (that is, the IPPs) now generate and sell electricity to the KPLC under a power purchase agreement.[654] Kenya also records significant progress in the area of electricity access through increased funding for the

[649] Mokveld and von Eije (n 494) 32.
[650] Energy Act 2019 ss 132, 133.
[651] Ibid s 206.
[652] Godinho and Eberhard (n 521) 7
[653] Ibid 42.
[654] Ibid 12.

KREP.[655] More particularly, electricity functions are separated to meet the new funding arrangements and ownership structure.[656]

In the area of regulation, Kenya has been able to convert an advisory regulator in the Electric Power Act (that is, the ERB in the EPA 1997) to a decision-making regulator (that is, the ERC in the Energy Act 2006 to the EPRA in the New Energy Act),[657] and expands the mandates of the energy regulator to include the regulation of RE,[658] including explicit mandates over imports and exports of electricity.[659] Kenya has also recorded an increase in the use of RE (especially solar and wind) for power generation through a number of support mechanisms.[660] The introduction of a cost-reflective tariff structure for electricity pricing tariff is a plus to the development of renewables for electricity generation.[661] The REFiT enables the KPLC to competitively procure renewable electricity from the IPPs.[662] Overall, the developments in the Energy Act coupled with the introduction of a 22-year electricity development plan have helped to prioritise electricity from RE sources with provisions for special funding.[663] The thesis will now consider how the Energy Act has affected the KREP.

4.3 Rural Electrification Programme

For many years, international organisations have been applying the KREP as a yardstick for measuring the economic development of Kenya. The reason for this is that the KREP in Kenya is one of the country's key SD strategies, and it is part of the government's comprehensive

[655] Joe Ng'ang'a, 'Regulating the Energy Sector in Kenya', Energy Regulatory Commission, Kenya Geothermal Working Group Meeting Africa Union Commission Kampala, Uganda, 19 September 2011; Godinho and Eberhard (n 521) 4.
[656] Godinho and Eberhard (n 521) 3.
[657] Ng'ang'a (n 659) 3; Public-Private-Partnership, Energy Law and Regulation: Sample Laws and Regulations (Kenya), World Bank Group <https://ppp.worldbank.org/public-private-partnership/sector/energy/laws-regulations>.
[658] Godinho and Eberhard (n 521) 3.
[659] Public-Private-Partnership (n 661).
[660] Energy Act 2006 ss 63, 102, 103.
[661] Godinho and Eberhard (n 521) 10.
[662] Ibid 16.
[663] See p. 113.

economic development policy.[664] Although this chapter mentioned the KREP earlier, this section will provide further information on this critical program that aims to increase the uptake of RE in rural areas, and hence achieve SE and SD.

The KREP started in 1973 as a means of addressing the challenges of electricity access in places that are isolated from the main grids.[665] At that time, the GoK was providing subsidised electricity to people in rural areas who were not economically buoyant. By 2002, the KREP had barely achieved 4% electricity coverage and connectivity, in spite of the number of years it had been in existence and the amount of funding the GoK had spent on the program. Furthermore, the program then was a huge loss to the government. About 8% of the revenue realised from the KREP, together with a 5% levy introduced in 1998, was used in financing the loss arising from the implementation of the program.[666] Given the poor result, the GoK in the Sessional Paper proposed setting up a special purpose agency whose mandate was to provide improved electricity access in rural areas.[667]

The GoK has set three goals for the KREP under the SE agenda: (a) creation of a new body for the program; (b) use of RE for the program; and (c) large-scale use of RE resources but less hydro.[668] The use of RE in power production will be achieved through grid extension and the application of off-grid electricity supply (that is, standalone systems).[669] In 2006, the proposal received legislative backing following the passage of the *Energy Act 2006*, and in 2007 the REA was created as the body to oversee the KREP. The passage of the New Energy Act has

[664] Abdallah et al (n 174) 48.

[665] Ministry of Energy, *Sessional Paper* (n 533) 9; Sabah Abdullah and Anil Markandya, 'Rural Electrification Programmes in Kenya: Policy Conclusions from a Valuation Study' (2012) 16(1) *Energy for Sustainable Development* 103, 103.

[666] Ministry of Energy, *Sessional Paper* (n 533) 9, 55.

[667] Kenya Miniwind Project (n 46) 4.

[668] Ministry of Energy, *Sessional Paper* (n 533) 38; Abdallah et al (n 174) 48.

[669] Ayoub Hameedi, 'A Glimpse of the Rural Electrification Program in Kenya', *Climate Solver blog*, March 2013 <http://www.climatesolver.org/blog/glimpse-rural-electrification-program-kenya>.

entrenched the use of RE for the KREP. The new coordinator for the KREP, that is, the REREC, has an expanded mandate regarding the promotion of RE.[670]

The GoK has implemented legal, regulatory, economic and fiscal policies to boost electricity generation from RE sources, particularly off-grid electricity. The implementation of the KREP has led to significant progress in the uptake of RE in Kenya. The main source of funding for the program, that is, the REPF, has also been expanded.[671] Through the application of the REPF, Kenya has recorded substantial progress in grid expansion in rural areas, as well as increased use of renewables through mini-grids.[672] As at December 2017, Kenya has connected not less than 5.8 million households under the KREP.[673]

Kenya now has one of the best-served off-grid populations in the world.[674] The KREP in Kenya now focuses on the expansion of solar PV mini-grids and the retrofitting of the existing diesel-powered mini-grids. There are many off-grid projects designed to expand electricity distribution networks in Kenya.[675] One such project is the Kenya Off-Grid Solar Access Project, which is being funded by the World Bank. Through this project, Kenya sets up mini-grids to provide electricity for people in remote communities. In furtherance of this, the GoK has approved a mini-grid regulation to provide modalities for off-grid electricity.[676] Although Kenya has set a target of 100% electricity access by 2030, it has been suggested that the country is likely to achieve universal access earlier than planned.[677]

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[670] Energy Act 2019 s 44.

[671] Other sources of funds for the rural electrification program are interest from bank deposits, money appropriated by the Kenyan Parliament and revenue from other sources (such as donations approved by the Cabinet Secretary). See Energy Act 2019 s 53(1).

[672] Kenya Miniwind Project (n 46) 6.

[673] Lily Kuo, 'Kenya's National Electrification Campaign is Taking Less Than Half the Time it Took America', *Quartz Africa* (Online), 16 January 2017 <https://qz.com/882938/kenya-is-rolling-out-its-national-electricity-program-in-half-the-time-it-took-america/>; Castalia and Ecoligo, *Mini Grids in Kenya: A Case Study of a Market at a Turning Point* (World Bank, 2017) 5.

[674] Mokveld and von Eije (n 494) 6.

[675] Ibid.

[676] Ibid 33.

[677] Banerjee et al (n 138) xviii, 8.

4.4 Barriers to Renewable Energy Development in Kenya

Notwithstanding the potential of RE resources and the GoK's effort to develop RE resources for electricity generation, renewable electricity in Kenya still faces some challenges.[678] Resistance from local communities in the execution of RE projects remains a major challenge to the development of RE for electricity generation in Kenya. Renewable resources are available in different locations across Kenya, and mandatory consultation is required in relation to RE projects in the communities where the resources are located. In some cases, resistance from local communities hinders the utilisation of RE resources for electricity generation.[679] For example, the construction of a wind power project in Kinangop and a geothermal power project at Olkaria were suspended at some point due to communal crisis.[680]

In rural communities in Kenya, a lack of knowledge and awareness of how RE technologies work is another major obstacle to RE development. Many communities in Kenya are still populated by uneducated people, who lack a basic understanding of the concept of RE technologies and how they work. As a result, the communities sometimes unduly focus on the technical and potential adverse environmental impacts of RE technologies, without fully understanding the benefits. This has slowed down the circulation and usage of renewable infrastructure and technical knowledge.[681]

Another barrier to the development of renewable-sourced electricity in Kenya is the poor connection to the grid, which has affected the expansion of RE infrastructural technology. As a result, a significant portion of the electricity is lost to the outdated transmission network. This

[678] MoEP, *Kenya Action Agenda* (n 30) 42.
[679] Pueyo (n 43) 92.
[680] Ibid 92; Kevin Mwanza, 'When the Maasai Met the Maori: Kenya Seeks to End Geothermal Land Conflicts', *Thomson Reuters*, 19 March 2018 <https://www.reuters.com/article/us-kenya-energy-newzealand/when-the-maasai-met-the-maori-kenya-seeks-to-end-geothermal-land-conflicts-idUSKBN1GV00H>.
[681] Yibeltal T Wassie and Muyiwa S Adaramola, 'Potential environmental impacts of small-scale renewable energy technologies in East Africa: A systematic review of the evidence' (2019) 111 *Renewable and Sustainable Energy Review* 377, 387.

has caused investors to lose interest in financing some of the RE technologies, for fear of sustaining losses from the poor transmission network.[682]

Other challenges include the delay that renewable electricity operators experience in getting approvals for PPAs,[683] high initial costs of investment,[684] inadequate financial support/fiscal incentives[685] and lack of technical expertise in RE technologies.[686] Some of these challenges, such as the high initial costs and inadequate financial support, are common problems generally across the globe. Furthermore, in reality, many of the fiscal incentives do not apply specifically to RE projects.[687] The GoK's inability to issue private investors with letters of credit has further affected the credit rating of electricity investors and by extension the development of RE.

4.5 Conclusion

Key provisions in the *Energy Act 2006* and the New Energy Act have significantly improved the legal regime governing the uptake of renewable electricity in Kenya. The New Energy Act does not only retain the important provisions of the *Energy Act 2006*, but also introduces some other innovative provisions. One such improvement is the reform of the electricity industry to allow off-grid distribution. Although the goal of the reform is to create a fully liberalised and competitive electricity sub-sector, what has resulted thus far is partial liberalisation. The involvement of the private sector, alongside the GoK, will likely spur massive investment inflows for electricity projects.[688] Electricity reform in Kenya offers more opportunities for private investors in the electricity sub-sector.

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[682] Ministry of Energy, *Sessional Paper* (n 533) VIII, 24.

[683] Export Solutions, *Kenya: Electrical Power Systems* <https://www.export.gov/article?id=Kenya-electrical-power-systems>.

[684] Ibrahim Abdulganiyu, Samuli Honkapuro and Salla Annala, *Prospects, Barriers and Possible Mitigation Measures of Integrating Renewable Energy into Kenyan Power System and Market* (14th International Conference on the European Energy Market, Dresden, Germany, June 2017) 5.

[685] UNEP FI (n 312) 27.

[686] Stephen Karekezi and Waeni Kithyoma, 'Renewable Energy in Africa: Prospects and Limits' (Workshop for African Energy Experts on Operationalizing the NEPAD Energy Initiative, Dakar, Senegal, 2–3 June 2003) 20.

[687] Le Dong and Akihisa Mori, *Impact of the Unbundling on Renewable Electricity: Evidence from Kenya* (IAEE Paper, 2017) 8.

[688] Wangong'u and Kipkurui (n 539).

Kenya has made more progress in the development of RE than most other African countries, particularly in the application of RE for off-grid electricity generation. Through a business-friendly regulatory environment, Kenya is likely to attract more foreign investments through public–private financing. With respect to environmental objectives, it is not clear whether Kenya is actually committed to environmentally friendly electricity, as it has chosen coal as one of the sustainable electricity generation sources, in a bid to meet its affordability and security objectives. Coal is known to be a major source of environmental pollution. The GoK has spent and will further spend a significant amount on coal-based electricity plants. It took the intervention of a court, through a court order, before the GoK halted the construction of the Lamu coal power plant.[689] The commitment to coal reflects the challenge of balancing access, affordability and security objectives with environmental sustainability objectives.

In the area of regulation, the New Energy Act may have assigned too much power and responsibility to the Cabinet Secretary. The Cabinet Secretary is now the person responsible for prescribing any form[690] that may be required under the Act, in addition to the policy formulation function.[691] This may, in the future, result in abuse of power by the Cabinet Secretary. The implementation of the tariff structure under the net-metering system for electricity from RE sources is another area that may also present some difficulties. This is because the determination of a fair and reasonable tariff for eligible contracts for the sale of electricity is rather subjective.[692]

However, overall, Kenya has gradually embraced the vision of its energy policy with SD objectives. The country has been guided by the prospects offered by RE for electricity

[689] Michael Boulle, 'The Hazy Rise of Coal in Kenya: The Actors, Interests, and Discursive Contradictions Shaping Kenya's Electricity Future' (2019) 56 *Energy Research & Social Science* 101205.

[690] This is the word used in the Act. Although the Act does not contain a definition of "Form", the meaning of the word in the context of the Act is equivalent to the word 'procedure' i.e. the Cabinet Secretary is responsible for prescribing any procedure required under the Act.

[691] Energy Act 2019 s 93(2).

[692] Ibid s 163(3).

generation and access. The next chapter will discuss how Kenya's RE experience can offer lessons for Nigeria

CHAPTER 5

COMPARATIVE STUDY: LESSONS FOR NIGERIA

> Kenya gives cause for hope in terms of electricity regulation in Africa. If the lessons learnt from its power-sector reform process were applied elsewhere, it is likely that significant progress would be made towards ridding the continent of the stigma of darkness.[693]

As noted in Chapter 1, Nigeria can potentially derive lessons from Kenya in the application of laws for the uptake of RE. This chapter will address the question: What lessons can Nigeria learn from Kenya's experience? In answering this question, this thesis will undertake a comparative analysis of the legal regime for the regulation of electricity and access in the two countries. In so doing, it will demonstrate that, though Nigeria and Kenya share a similar historical background in the aspiration to transit from fossil sources to RE sources for electricity generation, the two countries differ in their approaches and strategies.

5.1 Promotion of Renewable Energy for Electricity Generation in Nigeria and Kenya: A Comparative Analysis

In Nigeria and Kenya, the SE objectives are broadly similar: the pursuit of energy security (including affordability of electricity, access to electricity and stability in supply), reducing dependence on fossil energy sources, and protection of the environment. These objectives flow from the previous electricity challenges in the two countries, that is, insufficient generation capacity, overdependence on fossil energy, high costs of electricity, unequal electricity access between the urban and rural populations, unreliability of the supply system and the impending global warming arising from the power generation sources.[694] The political and economic situation of the two countries also has impact on the governance of energy resources in the two countries. Kenya has had stable democratic governance compared to Nigeria.[695] The unstable political situation caused by the military intervention in politics affects the regulation of

[693] Kapika and Ebenhard (n 483) 47.
[694] See pp. 27, 29 and 88.
[695] See p. 86.

electricity in Nigeria.[696] The laws and energy policies of the two countries play – or should play – important roles in the realisation of these objectives. In the realm of policy, Nigeria and Kenya have adopted a broadly similar approach, by recognising the need to meet SE and SD objectives by diversifying electricity sources to include RE. Diversifying electricity generation sources will boost electricity capacity, reduce dependence on fossil-fuel energy, enhance the security of the electricity supply system and protect the environment.[697] Also, the energy policies of Nigeria and Kenya recognise that the deployment of modern RE technologies is key to providing electricity access, especially in rural and remote areas. Although the policy objectives of these two countries are nearly identical, the laws underpinning these SE objectives in Nigeria and Kenya differ in material respects. As the comparative analysis will soon reveal, the differences in the provisions of the relevant legislation are an important factor in explaining the different rates of RE uptake in the two countries.

In Nigeria, the earliest electricity laws were the Electricity Corporation of Nigeria Ordinance, the Electricity Act and the *NEPA Act*, followed by the *ECN Act*. From the early 1970s when these laws were passed up to 2005 when the Electricity Act and the *NEPA Act* were repealed, Nigeria did not have a law to promote the uptake of RE. Although the various policy documents that were approved before and after the enactment of the *EPSR Act* (that is, the NEP, the REPG, the REMP, the NREEEP, etc.) identify the need to promote electricity generation from RE sources, fossil fuels (that is, gas, with some large hydro) remain the dominant electricity generation source.[698] A major reason for this is that the legal framework within which electricity reform has been undertaken in Nigeria is not designed to favour the uptake of RE.

Unlike Nigeria, Kenya's experience regarding energy transition demonstrates the fundamental role that law can play in the uptake of RE. For the period between the enactment of the EPA

[696] See p. 2.
[697] See pp. 31 and 89.
[698] See pp. 47 and 50.

1997 and the *Energy Act 2006*, Kenya recorded a reduction in the dominance of fossil energy sources in electricity generation.[699] The passage of the *Energy Act 2006* was a further departure from the previous laws on the uptake of RE. Kenya now has a well-diversified electricity generation mix, with not less than 85% from RE sources (that is, wind, geothermal, solar and hydro), thereby contributing to the security of energy supply.[700]

Kenya's success has come about as a result of the legal and regulatory framework for RE from the *Energy Act 2006* to the New Energy Act. Kenya has grown from a modest beginning to becoming a 'superpower' in renewable electricity in Africa. According to a World Bank report, Kenya operates one of the most successful electrification programs in sub-Saharan Africa and has 'one of the best-served off-grid populations in the world'.[701]

5.1.1 Approach to National Energy Law and Policy

The approach to the implementation of the energy policy and the electricity law is a critical difference between the two countries. In Nigeria, the first national energy policy, that is NEP, was approved in 2003, two years before the *EPSR Act*. However, the *EPSR Act* did not implement the provisions of Nigeria's NEP on the development of RE. The position remains the same with the various policy documents that were approved after the enactment of the *EPSR Act* (e.g. REMP, the NREEEP, SE4ALL-AA, etc.). The omission of the provisions of the energy policy from the law in Nigeria creates a disconnection between government policy on RE, and the law required to ensure the policy objectives are achieved. This means many important provisions that could have facilitated the uptake of RE policy, such as prioritising grid access for renewable electricity, cannot be effectively implemented due to the absence of law.

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[699] See p. 93.

[700] World Bank, *Maximizing Financing for Development in Action: The Kenya Energy Sector Experience* (2019) <https://www.worldbank.org/en/results/2019/04/18/maximizing-financing-for-development-in-action-the-kenya-energy-sector-experience>.

[701] Mokveld and von Eije (n 494) 6.

A good example of this is the non-discriminatory electricity regime in the *EPSR Act*, which has nullified the priority provisions in favour of RE contained in the REFiT, the NREEEP and the SE4ALL-AA.[702] The rationale behind the non-discrimination provision in the *EPSR Act* is to create a competitive electricity market and to prevent abuse of market power. The *EPSR Act* ought to have granted an exception for RE, being an energy source that cannot 'survive' if there is a level playing field for all energy sources. The *EPSR Act* replicates the electricity regime that existed during the time of the defunct NEPA, in which fossil-fuel energy sources dominated electricity generation.[703] The government's policy on the potential of RE sources espoused in the various documents is neither articulated nor advanced in the *EPSR Act*.[704] The little that Nigeria has achieved is based on the effort of the electricity regulators (that is, the NERC and the FMPWH) to improve the electricity situation in the country. The failure of the EPSR Act to impose obligation to develop RE resources and/or technology on the electricity regulators in Nigeria is a challenge to the development of RE.[705] As a result of the disconnection between law and policy, and deficiencies in the law, fossil energy (in particular gas) remains the dominant energy source.[706]

In contrast to Nigeria, Kenya has sustained a link between energy policy and the law. In enacting the *Energy Act 2006*, the Kenyan Parliament adopted the proposals for the electricity sub-sector in the Sessional Paper 2004. By the time the *Energy Act 2006* was passed into law, all of the key provisions of Kenya's national energy policy already formed part of the law.[707] In furtherance of the synergy between energy policy and the law, the *New Energy Act* has introduced a modality for the implementation of an integrated national energy plan and for its regular review.[708] This direction in the law on the implementation of an integrated energy plan

[702] See p. 69.
[703] See pp. 45 and 59.
[704] See p. 77; Yemi Oke, 'Beyond Power Sector Reforms: The Need for Decentralized Energy Options (DEOPs)' (2012) 18(1) *Nigerian Journal of Contemporary Law* 67.
[705] Oniemola, 'Why Should Oil Rich Nigeria' (n 36) 34.
[706] See p. 77.
[707] See p. 98.
[708] See pp. 111-12.

will provide clear direction for the implementation of other policy documents on electricity planning for SD.

Whilst the lack of synergy between policy and the law is affecting the actualisation of Nigeria's RE objectives, the consistency between the provisions of the national energy policy and the law in Kenya has aided the adoption of RE technologies as a national priority in almost every national development policy.[709] Kenya's approach of requiring the implementation and review of the national energy policy as a matter of law appears to be a better approach than Nigeria's, where the national energy policy is implemented through regulatory directives. This explains why the *EPSR Act* has not succeeded in changing the dominance of fossil energy sources in Nigeria, whereas Kenya has moved from an electricity mix that is largely dominated by fossil energy to one with a significant contribution from RE.[710]

5.1.2 Electricity Reform and Regulatory Framework for Renewable Electricity

Electricity reform in many African countries typically targets divestment of the government's stake in government-owned utility companies through the adoption of a model that permits the involvement of private entities in the ownership and management of such companies. Divestment creates either vertical or horizontal unbundling of electricity functions.[711] In some cases, unbundling is undertaken by amending the existing law, while in others a new law is passed to implement the unbundling process.[712] Nigeria and Kenya adopted a broadly similar approach to electricity reforms, with major reforms being undertaken by enacting new laws. The reform objectives in the two countries are also substantially similar.

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[709] See pp. 98-9; R H Acker, 'The Quiet (Energy) Revolution: Analysing the Dissemination of Photovoltaic Power Systems in Kenya' (1996) 24(1) *Energy Policy* 81, 81.

[710] See p. 92.

[711] Vertical unbundling is the separation of key power functions such as generation, transmission and distribution. Horizontal unbundling occurs where multiple entities compete with one another or provide services in different areas. See Power Futures, *What is Unbundling? Understanding Electricity Sector Unbundling in SA* (2019) <https://www.powerfutures.org/updates/2019/2/6/what-is-unbundling-understanding-electricity-sector-unbundling-in-sa>.

[712] Njeri Wamukonya, 'Power Sector Reforms in Sub-Saharan Africa: Some Lessons' (2005) 40(50) *Economic and Political Weekly* 5302, 5303.

In Nigeria, electricity reform has targeted liberalisation of the electricity market to make it more competitive; provided a new legislative framework for electricity generation; created a new electricity regulator; and sought to reform the REP. Just like Nigeria, electricity reform in Kenya had targeted four areas: policy formulation, restructuring of power utilities, provision of a legislative framework, and an improved KREP.[713] In both Nigeria and Kenya, one of the consequences of electricity reform is the separation of electricity policy and regulatory functions from commercial activities.[714] For the regulatory function, Nigeria's *EPSR Act* creates a single-entity structure in favour of the NERC.[715] Although Kenya also adopts a single-entity regulatory structure, the ERC in the *Energy Act 2006* is the regulator for the electricity and petroleum industries.[716] The New Energy Act creates a regulatory structure similar to the one in the *Energy Act 2006*. In the *New Energy Act*, the EPRA is the regulator for both the electricity and petroleum industries. Except for some specialised matters (such as nuclear energy), the power of Kenya's EPRA covers all the activities in the energy value chain. The EPRA in the New Energy Act is thus a regulator with wider powers than the NERC in Nigeria's *EPSR Act*. Given that certain activities within the petroleum industry (e.g. prices of petroleum products) have bearing on the electricity sub-sector, Kenya's system appears to be a better option.

Another important consideration regarding electricity reform in the two countries is the performance of commercial activities. In Nigeria, with the exception of the transmission function that is still wholly performed by a state-owned company, electricity generation and distribution functions have been fully privatised.[717] Although the FMPWH recently introduced a regulation that permits GenCos to bypass the DisCos and sell electricity directly to consumers, the introduction of this policy does not mean that the GoN is now involved in the

[713] See p. 99.
[714] See pp. 61 and 100.
[715] See p. 61.
[716] Energy Regulatory Commission (ERC), *Energy Regulatory Commission Strategic Plan 2008–2012* (2008) 14 <https://renewableenergy.go.ke/downloads/strategy-docs/ERC-Strategic-Plan.pdf>.
[717] See p. 64.

electricity generation function.[718] The ownership structure for generation and distribution entities in Kenya is different from what exists in Nigeria. The electricity regime in the *Energy Act 2006* permits the involvement of the private sector in the generation function, although the GoK continues to hold the largest shares in KenGen, whilst the KPLC remains the sole distributor of electricity.

Nigeria's electricity industry is thus more competitive than Kenya's. There are 6 GenCos and 11 DisCos in Nigeria (all of which are wholly owned by private entities), compared to Kenya, where the utility companies still enjoy a monopoly. The New Energy Act has introduced a change to the distribution functions in the *Energy Act 2006*. Private entities can now apply for electricity distribution licences and sell off-grid.[719] Whilst the involvement of other entities in the electricity distribution function will reduce the monopoly the KPLC has enjoyed over a long time, the New Energy Act does not completely liberalise the distribution function, in contrast to Nigeria.

Each of these electricity regimes has its comparative advantages. In Nigeria, by relinquishing electricity generation and distribution to private entities, the GoN has been able to reduce the endemic problem of corruption in the electricity industry. Compared to when it was 100% government owned and operated, electricity generation in Nigeria has also increased substantially. This means more investment funds for the electricity industry since privatisation was carried out in the expectation that private investors would bring in more funds to generate more megawatts of electricity.[720] However, because of the absence of an RE law, the increased electricity generation has not come from an increase in generation from RE sources, and the EPSR Act in its current form is unable to ensure additional investment in RE generation to meet the country's SE and SD objectives.

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[718] Ajala Samuel Akindele, 'Nigeria Govt Introduces New Electricity Distribution Policy to Bypass Discos', *AllAfrica* (Online), 4 December 2019 <https://allafrica.com/stories/201912050036.html>.

[719] See p. 108.

[720] See pp. 65; Nnamdi B Anosike, Jude E Dara, Ugochukwu C Ngwaka and Frances O Enemuoh, 'Analysis of Nigerian Electricity Generation Multi Year Tariff Order Pricing Model' (2017) 9 *Energy and Power Engineering* 541, 542.

In Kenya, the involvement of government, alongside the private entities, in generation, distribution and transmission has meant that the implementation of government policy in respect of renewables, supported by legislation, has been more straightforward, as the government-owned entities have been able to directly undertake actions relevant to increasing the uptake of RE, for example, in rural areas, as opposed to giving policy direction to private entities to undertake these initiatives in a competitive market.

5.1.3 Dedicated Funding and Promotion of Energy Investment

The introduction and implementation of RE technologies involves significant investment costs. For this reason, provision of funding for the development of RE has always been a key provision in the law. Funding for RE is also an important difference between Nigeria and Kenya. In Nigeria's EPSR Act, no fund is established purposely to promote RE, either through financing of RE infrastructure or for the purposes of research and development on RE technologies. The only funds in the EPSR Act are the REF and the PCAF.[721] Neither of these funds has the development of RE as one of its objectives. In Kenya, the New Energy Act establishes the CEF, one of whose objects is promotion of RE initiatives. The CEF is also one of the sources of funding for the REREC.[722] The CEF means more funding for KREP projects and subsidies for electricity access in rural areas. This is unlike in Nigeria, where inadequate funding has affected the pace of RE development.

5.1.4 Rural Electrification Programme

One attribute that is common to developing countries is the concentration of a large proportion of the population in rural areas. Nigeria and Kenya belong to this category with a significant portion of their populations living in rural areas. These areas are mostly not connected to the grid since they are remote areas. So, it is the duty of the governments in these two countries, and also a key component of the Sustainable Development Goals (SDGs) to bring electricity

[721] See p. 73.
[722] Energy Act 2019 s 53(1)(c).

access to people in rural areas. In Nigeria and Kenya, the REP started as a means of increasing the rate of electricity access in areas that are not connected to the national grid.[723] The electricity laws of the two countries have played a large role in determining the success rate of their REPs.

In Nigeria, the REA is responsible for the coordination of the REP. The *EPSR Act* does not impose an obligation on the REA to increase access to renewable-sourced electricity, though the use of RE is part of the rural electrification strategy. In contrast, in Kenya, the obligation to develop RE exists in the law and has always been imposed on the rural authority, from the REA in the *Energy Act 2006* to the REREC in the *New Energy Act*. The *New Energy Act* further imposes on the REREC the duty to develop and update an RE master plan.[724] Since no obligation is imposed on Nigeria's REA, the REA has not been committed to ensuring the uptake of RE, thereby leading to a poorer result than would be expected if REA were subject to such a mandate and if its performance had to be reported and objectively measured against legislation. This is one reason the electricity access rate in Kenya is better than in Nigeria.

Another critical consideration is the electricity access rate and the implementation of the rural electrification programme in the two countries. In both countries, the use of off-grid electricity (that is, standalone systems, mini-grids, etc.) is an essential component of the programme. In furtherance of this objective the GoK has approved a regulation for mini-grids in Kenya. With these mini-grids, Kenya plans to bring electricity access to a greater number of people. In Nigeria, although the Rural Electrification Strategy and Implementation Plan provides for the application of off-grid electricity as a means of increasing electricity access, there is no modality for the implementation of the mini-grid as in Kenya. This continues to affect the implementation of off-grid electrification in Nigeria, and is likely to make Nigeria lag behind Kenya in this regard.

[723] See pp. 70-1 and 119.
[724] Energy Act 2019 s 44(1)(e).

Closely related to the implementation of the REP is the issue of targets for electricity access. Kenya has set universal access by 2030 as the target for the KREP, with the interim aim of connecting 78% of the urban population and 60% in rural areas by 2020. Kenya is on the verge of achieving 100% electricity access in areas under the KREP earlier than the targeted timeframe. In addition to this, Kenya has recorded an increase in the application of RE technologies for electricity access.[725] The rural electrification access rate in Nigeria has not been as impressive as in Kenya. This may be due to lack of funding and the different target dates for universal electricity access for rural people. The REP's target in Nigeria is 75% and 90% electricity access by 2020 and 2030 respectively, while universal access is 'anticipated' by 2040.[726] Again, there is no available data to show that the 2020 target has been realised by Nigeria. Nigeria has also set a target of 10% RE, a very low target compared to Kenya's 50% target. The different RE targets in Nigeria and Kenya is arguably another factor that is responsible for the difference in the rural electricity access rate between the two countries.

Flowing from the above, it will appear that the REP's strategies in the two countries differ. First, the framework for the operation of the KREP in Kenya follows a well-structured policy direction. Kenya has mainstreamed the KREP's objectives into the country's sustainable economic development program. The KREP is being implemented in the context of broader economic goals.[727] This is not the case in Nigeria because the REP has not been mainstreamed into Nigeria's economic development policy. The REP policy and strategies in Nigeria exist independently of its economic policy. Secondly, Kenya has set priority areas for the program[728] and the GoK earmarks funds specifically for these priority areas. In Nigeria, funding is a major constraint to the implementation of REP projects, and funding is not sufficient to undertake

[725] See p. 120; Banerjee et al (n 138) xviii, 8.
[726] FMPWH (n 311) 33.
[727] Abdallah et al (n 174) 50; Kenya Miniwind Project (n 46) 4.
[728] Abdallah et al (n 174) 48.

many of the projects.[729] This makes the implementation of the program and the setting of priority areas difficult.

5.1.5 Regulation of Renewable Energy Feed in Tariff

As stated earlier, REFiT is one of the commonly used instruments for promoting the uptake of RE for electricity generation. The tariff encourages investments in renewable electricity by ensuring that off-takers of RE-sourced electricity receive a guaranteed price for the electricity produced, which covers costs and a profit margin.[730] REFiT in Nigeria exists as a regulatory instrument for the promotion of the uptake of RE. In other word, the REFiT regulation is subsidiary legislation. It is neither provided for in the *EPSR Act* nor in any other primary enactment. This was also the case with Kenya's Energy Act 2006, before the New Energy Act was passed into law. With the passage of the *New Energy Act*, the REFiT in Kenya has changed from a regulatory instrument to an instrument with the force of law.

The status of the REFiT in the two countries has implications for how the provisions are applied. Since REFiT is subsidiary legislation in Nigeria, its provisions cannot override the provisions of the *EPSR Act*, which is a primary legislation. This means that in the event of conflict between the REFiT and the *EPSR Act*, the provisions of the *EPSR Act* will prevail. This has undermined the effectiveness of the REFiT in Nigeria. In Kenya, the issue of conflict between the provisions of the REFiT and the law is not likely to arise because the New Energy Act has incorporated the REFiT 2008 and its amendments. This means that in Kenya the provisions of the REFiT will apply with the same force as the provisions of the *New Energy Act*. Having the REFiT and its objectives clearly stated in the law provides certainty in the implementation of the REFiT's objectives.[731]

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[729] Emeka Anuforo, 'Funding, Policy Inconsistency Haunt Nigeria's Rural Electrification Access', *Guardian*, 20 November 2016 <https://guardian.ng/business-services/funding-policy-inconsistency-haunt-nigerias-rural-electrification-access/>.

[730] M Meyer-Renschhausen, 'Evaluation of Feed-in Tariff Schemes in African Countries' (2013) 24(1) *Journal of Energy in Southern Africa* 56, 56.

[731] See pp. 114-5; Meyer-Renschhausen (n 734) 61.

The size of the tariffs is another important difference between Nigeria and Kenya. Generally, a REFiT must be carefully set to maintain a balance between investment promotion and affordable electricity. This is because, while a low tariff will discourage investment in renewable electricity, a high tariff will make electricity unaffordable to consumers. Therefore, the tariff must spur investment without taking electricity out of the reach of consumers. In Kenya, the REFiT specifically provides for the percentage of the tariff that an off-taker can recover from electricity consumers. By specifying the portion of the tariff that is borne by the electricity off-taker, the application of the REFiT in Kenya will have minimal impact on the affordability of electricity. This important provision is missing in Nigeria's REFiT. In Nigeria, electricity consumers bear 100% of the REFiT since the regulation does not specify the portion of the tariff to be borne by electricity consumers. In the absence of subsidies for renewable electricity, passing on the cost of renewable-sourced electricity to consumers will affect their ability to pay for renewable electricity.

Another consideration in the operation of the REFiT is the amount of renewable-sourced electricity which must be purchased under the REFiT in Nigeria and Kenya. In Nigeria, the maximum target for renewable electricity that must be purchased at the relevant tariff under the REFiT is 2,000 MW. Out of this figure, the regulation imposes a 50% mandatory purchase obligation on the NBET (i.e. 1000 MW), while the DisCos must purchase the remaining 50% (i.e. 1000 MW). Thus, in Nigeria, no obligation is imposed on either the NERC or the DisCos to purchase renewable electricity above 2,000 MW. Unlike Nigeria, the REFiT law in Kenya does not set a maximum megawatt capacity for electricity from RE sources, and it imposes a 100% purchase obligation on the off-taker of electricity. The performance of the REFiT in encouraging RE in Kenya is therefore not constrained by a cap or target.

Closely related to the megawatt targets is the issue of review of the tariff. In Nigeria, the NERC has the power to review the REFiT and to increase it up to a maximum of 5%.[732] This means

[732] NERC, *Regulation on Feed in Tariff* (n 372) s 8(j).

that the tariff in the regulation is the guaranteed minimum tariff for renewable electricity. In Kenya, the REFiT allows EPRA to carry out a review of the tariff, but the regulation does not provide for the rate of such a review.[733] It has been argued that Kenya's REFiT is a maximum tariff and cannot be revised to meet any changing circumstances despite the review clause.[734] According to Meyer-Renschhausen, electricity generators may not be encouraged to generate electricity if the tariff is lower than the cost of the electricity produced.[735] The upward review provisions in Nigeria's REFiT gives the regulator the opportunity to adjust the tariff in cases where the cost of generation will be higher than the guaranteed tariff. In this regard, Nigeria's REFiT appears to be better than Kenya's REFiT.

5.1.6 Other Incentives for Renewable Electricity

In Nigeria, other incentives for the promotion of electricity from RE sources are not explicitly provided for in the *EPSR Act*. There are fiscal and economic incentives through other areas of law. This is also the case in Kenya where fiscal and economic incentives are not provided for in the *New Energy Act*. Not having incentives in the *EPSR Act* and the *New Energy Act* may lead to uncertainties in determining which RE projects are eligible for fiscal incentives or subsidies.

5.2 Lessons for Nigeria

The foregoing analysis of the RE policy objectives, and the legislative provisions regarding the promotion of RE in Nigeria's *EPSR Act* and Kenya's *Energy Act*, reveal some similarities and some areas of divergence between the two countries. Considering the electricity situation in Nigeria, and what the country requires to address the electricity challenges, this thesis will now identify some provisions of Kenya's *Energy Act 2006* and *New Energy Act* that may serve as lessons for Nigeria.

[733] Ministry of Energy, *FiT Policy* (n 491) ss 22, 70.
[734] Meyer-Renschhausen (n 734) 63.
[735] Ibid 62.

5.2.1 Approach to National Energy Policy

The relationship between the provisions of the law and the energy policy is a critical issue that Nigeria needs to address if the country want to achieve sustainable electricity generation and access. In this regard, the implementation of energy policy and the law in Kenya offers a lesson for Nigeria. Kenya has been aligning key provisions of its energy policy with the law since the time of the Sessional Paper. In Nigeria, the lack of synergy between the law and the energy policy has affected the uptake of RE. Nigeria must align the goals and objectives of its energy policy, including RE policy, with the law. Since Nigeria's energy policy supports diversification of electricity sources in favour of RE, aligning the energy policy and the law will help to transform Nigeria's electricity law, and hence its electricity profile, from one that is fossil-based to one that prioritises RE.

Nigeria needs to ensure that there is a synergy between its RE policy and the law. Adopting this lesson in Nigeria may face some practical challenges in view of the fact that major policies on RE were approved after the passage of the *EPSR Act*. For this reason, Kenya's approach whereby policy objectives for the electricity sector vis-à-vis RE are first set out in the energy policy is practically impossible in Nigeria. For this reason, Nigeria may have to update its RE policy and enact a law to capture the renewable electricity objectives. It is only this way that Kenya's approach to national energy policy can be duplicated in Nigeria.

Related to this, and perhaps an important lesson in the area of energy planning, is the implementation of an integrated energy plan. This is of particular importance to Nigeria where agencies under the direct supervision of the federal government are in charge of policy formulation functions for the electricity industry. An integrated energy plan will ensure that the energy needs of every state in Nigeria are captured and implemented in the national energy policy. Nigeria should adopt elements of the Kenyan approach to encouraging RE, and adopt one national policy that sets out the national government's RE objectives and strategies, in place of the numerous policy documents which currently exist. The GoN should then engage in

law reform to ensure that (a) there are no conflicts between RE policy and the law, and (b) that the provisions and measures within the legislation are adequate to achieve the RE policy aims.

The implementation of Kenya's approach, particularly the implementation of the integrated national energy plan, may pose some difficulties in Nigeria given the current state of the electricity law. Apart from the fact that there is no law to mandate all the states in Nigeria submitting their respective energy policy for national integration, except for a few states such as Lagos and Oyo States, many Nigerian states neither have a ministry for energy nor a body in charge of electricity matters. The Federal Ministry of Power may, as a temporary measure, have to set up an energy centre in each state of the federation, like in Kenya, to coordinate the preparation of the energy plan of each state. This will go a long way towards implementing an integrated national energy plan.

5.2.2 A Case for Renewable Energy Law

The thesis has shown that a significant percentage of the population in Nigeria has no access to electricity. A massive deployment of RE-sourced electricity could enable Nigeria to address the challenges of electricity security, access and sustainability. However, Nigeria's current electricity law cannot drive the large-scale uptake of RE.

As Kenya has done, Nigeria must enact a law to drive the transition to the use of RE for SE. Although Nigeria has employed power sector reform to introduce major changes in the electricity sub-sector, this has not succeeded in promoting the uptake of RE for electricity generation. The *EPSR Act* does not support the provisions of the energy policy that would have increased electricity generation from renewables. The *EPSR Act*, as it stands, is not likely to further Nigeria's aspiration of generating electricity from RE sources for the SD of the country. It is therefore imperative that, like Kenya, Nigeria introduces law that is dedicated to and effectively supports the promotion of RE. This could involve either amending the *EPSR Act* to implement a national RE policy, or repealing the *EPSR Act* and enacting new legislation that is

more suited to achieving the country's RE, SE and SD objectives (as Kenya has done with its Energy Act).

Nigeria needs an RE law for the following three reasons. In making a case for this law, this thesis will refer to the role of legislation in SE that was discussed in Chapter 2.[736]

First, having an RE law in Nigeria will ensure there is a legislative backing for RE policy. One of the roles of law in SE is the provision of binding precepts for policy. There are general and specific policies for the development of RE resources for electricity generation. These policy documents need to be strengthened and backed by law so that their provisions can be implemented. The NREEEP and the SE4ALL-AA, for instance, highlight the challenges of electricity generation in Nigeria and how Nigeria can explore its RE potential to address these challenges. However, the absence of law has robbed Nigeria of the opportunities offered by these policies. Some of the policy documents are time-based, which makes their provisions inoperative with the passage of time. Nigeria's vision of increasing the country's electricity capacity to between 25,000 MW and 40,000 MW in the Vision 20:20 report will soon become a fiction. Vision 20:20 and other similar policy documents have failed, or will fail, due to an absence of law to translate the key provisions into more electricity. Next is the electricity vision 30:30 in the SE4ALL-AA whereby Nigeria plans to increase its electricity generation capacity to 30,000 MW by 2030. It is imperative for Nigeria to enact a law to make the country's renewable electricity aspiration a reality.

Secondly, Nigeria needs an RE law to facilitate the exploitation of commercially viable RE resources. Globally, law has been employed as a tool for the exploitation of commercially viable RE resources.[737] In Nigeria, there are objectives and strategies for exploiting RE resources, particularly solar, small hydro, wind and biomass.[738] This is also the case with the REP, where solar and wind energy have been identified as being commercially viable RE

[736] See pp. 32-5.
[737] See p. 33.
[738] See pp. 50, 53.

resources that will be deployed to provide electricity to the remote parts of the country. There is a need for a law to facilitate the exploitation of these commercially viable resources for electricity generation. Kenya has adopted this approach in the development of geothermal resources for electricity generation. As earlier stated, Kenya set up the GDC to facilitate commercial development of geothermal for electricity generation.[739] Nigeria needs a law to set the machinery in motion to actualise this objective.

Finally, Nigeria needs a new law for the purposes of providing a regulatory framework that will address the challenges of renewable electricity in Nigeria. As noted in Chapter 2, law has always been an important tool for the regulation of electricity worldwide. However, the current Nigerian regulatory framework does not take the development of RE into consideration. Nigeria requires a law that clearly specifies the role of the key stakeholders in promoting the uptake of RE for electricity generation. This will ensure that the regulatory regime in the proposed law changes from one that favours fossil energy to one with a preference for RE.

The above points support the need for a new legal regime for the development of RE in Nigeria through the law. As Kenya has reviewed its law in 2006 and 2019 to ensure that its legislation is able to support its RE objectives, so too should Nigeria engage in law reform.

5.2.3 Dedicated Funding for Renewable Energy

Another important point in Nigeria is the funding and promotion of investment in RE projects. Due to the high initial costs and the nature of RE technologies, the development of RE requires the setting aside of a fund to, among other things, promote research and development, and provide subsidies for the implementation of RE infrastructure projects. In this regard, the introduction of the CEF, in addition to the REPF, in the New Energy Act offers a lesson for Nigeria. Of particular relevance to Nigeria are the sources of Kenya's CEF. One of the sources of the CEF is assets recovered as proceeds of crimes in the energy sector. This is particularly

[739] See p. 97-8.

important to Nigeria in view of the fact that corruption is one of the banes of energy sector development in Nigeria. Some individuals are already on trial for various offences bordering on corruption in the energy sector.[740] Having an RE law with provisions for this type of funding source will ensure that funds that were originally meant for the energy sector find their way back into the sector. This will assist in addressing the challenges of funding for research and development and the implementation of RE projects across Nigeria.

The issue of funding for renewable electricity should be addressed as a matter of priority. There is no evidence that the post-privatisation model has been able to attract the anticipated funding and investment. The GoN is still providing financial support to both GenCos and the DisCos with funds running into billions of naira in a bid to prevent a total collapse of the electricity sub-sector. It is also important for Nigeria to undertake electricity reform with the aim of providing the necessary funding for the electricity industry (including funding for renewable electricity) as well as creating the right environment for investment.

The funding schemes in Kenya's Energy Act (especially the CEF and the REPF) may not generate the level of funding needed to turn Nigeria's renewable electricity around. This is because the sources of funds for the CEF and the REPF in Kenya's Energy Act are mainly internal sources. However, the state of Nigeria's economy may not permit preferential allocation of funding for the development of RE. Nigeria's economy is predominantly crude oil based. Frequent changes in the price of crude oil in the international market affect Nigeria's foreign earnings, and by extension the nation's budget. What Nigeria requires is a blend of foreign and local funds. The law should be drafted in a way that will allow funding from international organisations such as the World Bank and the International Monetary Fund. This way, a funding scheme like the one in Kenya's Energy Act will achieve similar results in Nigeria.

[740] The EFCC in the matter of *EFCC v Owan & 7 Others* (Suit No FCT/HC/CR/34/09) took some officials of the NERC to the Federal High Court on charges bordering on corruption.

As an addition, and since Nigeria's obligation to use RE for electricity generation also flows from its international obligations, Nigeria can ensure that special protection is accorded to RE investment through investment protection mechanisms under international law (such as umbrella clauses, fair and equitable treatment, etc.). This will serve as a guarantee to foreign investors that any investment scheme for RE in Nigeria will not change.

5.2.4 Energy Reform

Kenya's experience in the area of electricity reform, which permits the co-existence of the state and private sector entities in electricity generation and distribution functions may, in fact, not offer any useful lesson for Nigeria. While this may provide for a mix of public and private funds for electricity generation and distribution functions, the peculiar circumstances of Nigeria will not make this a good approach. Corruption and inefficiency are among the major challenges in Nigeria's public sector, including the energy sector. This was one of the reasons why the electricity industry was privatised. While Kenya's system may have given the KenGen better control over its renewable electricity obligations, adopting this system in Nigeria by allowing government participation in electricity generation and distribution functions will mean returning to the very reason the electricity sector was privatised in the first instance. This will take Nigeria back to the era when NEPA was in charge of electricity generation and distribution, an era that was characterised by large-scale corruption and inefficiency. In a 2003 report, the NEPA was regarded as the second most corrupt institution in Nigeria. The challenge of corruption and inefficiency did not cease even with the emergence of the PHCN, the successor company to NEPA, until the PHCN was finally unbundled in 2010. The PHCN could not provide stable electricity for Nigerians.[741]

Given that the GenCos have been privatised and there is no question of establishing state-owned GenCos, what Nigeria needs in the circumstances is a law that will succeed in ensuring

[741] Omonijo D Ojo and Okiti O Orue, 'Patterns of Corruption in Power Holding Company of Nigeria (PHCN), Awka' (2009) 1(1) *Interdisciplinary Journal of the Nigerian Sociological Society* 87, 88–9.

the targets for RE generation are met by the GenCos who are now owned by private companies. This can be achieved by placing legal obligations to source electricity from RE on the GenCos. In support of this obligation, the law could provide for subsidies and other incentives to promote off-grid electricity, that is, standalone systems and mini-grids. In this regard, Nigeria could introduce supply-side market mechanisms, such as legislated RE auctions, or legislated RE portfolio standards, or a mechanism similar to Australia's Renewable Energy Target, to underpin the development of RE in electricity generation. It could also investigate a carbon tax, with proceeds supporting RE development, although compensation and support for the poor would be an essential consideration in any mechanism.

5.2.5 Incorporation of REFiT into Law

Another important lesson for Nigeria from Kenya is the incorporation of the REFiT in the law. The operation of the REFiT is a point that Nigeria needs to address since its operation is based on the regulatory powers of the NERC rather than the law. There are a few other issues in the operation of the REFiT which, if not properly addressed, will impact on the provision of affordable electricity and access. First, and perhaps the important consideration in the operation of the REFiT in relation to access, is the allocation of the tariff. By allocating the renewable electricity tariff between the off-takers and consumers, Kenya's REFiT promotes affordability, and consequently access, more than Nigeria's. In Nigeria, the REFiT regulation does not specify the portion of the tariff that will be borne by electricity consumers. This means that the renewable electricity tariff is 100% borne by consumers in Nigeria, and this is likely to affect the GoN's efforts to provide affordable electricity.

Secondly, the megawatt target for the mandatory purchase obligation in the REFiT is an area where Kenya's experience may serve as a lesson for Nigeria. The 2,000 MW maximum capacity in the REFiT regulation in Nigeria is not likely to promote investment in renewable electricity since there is no guarantee that there will be a market for electricity above the 2,000 MW in the REFiT regulation. This is because the mandatory purchase obligation

provisions apply to the 2,000 MW target and not above it. So, neither the DisCos nor NERC is obligated to purchase excess electricity above the set target. Adopting Kenya's approach will ensure that there is a market for renewable electricity produced at any capacity. This will boost investors' confidence that there will be a market for all renewable electricity produced.

Incorporating the REFiT into the EPSR Act without amendments to the Act to bring the provisions of the law in line with the REFiT will lead to conflicts. To avoid this, Nigeria may need to either enact a new electricity law that will favour the uptake of RE or amend the current EPSR Act to favour uptake of RE. By doing so, the incorporation of the REFiT into the law will promote the policy objectives behind the REFiT. Also, while it is desirable to grant priority connection to electricity from RE sources, it is equally important to address other issues, such as health and safety regulation requirements, that may affect the priority connection for renewable electricity.

5.2.6 Rural Electrification

The REP is another area that Nigeria needs to critically consider. The experience in Kenya has shown that a well-designed REP, supported by legislation, offers prospects for the application of RE to increase electricity access in rural areas. Nigeria needs to prioritise the program, especially in states where the electrification rate is below the national target. With the right law, including other regulatory provisions in support of RE, Nigeria will be able to provide sustainable electricity for its growing population.

It may be difficult to prioritise REP projects in states that have electricity access below the national targets in Nigeria in the absence of data to support identification of those states. Nigeria therefore needs to strengthen its data-gathering methods to ensure availability of data for decision making. There should also be effective coordination between the federal and state

governments in Nigeria regarding the implementation of the REP to facilitate exchange of data for REP projects.[742]

5.3 Conclusion

This thesis has shown that, while there are a few areas of divergence between Nigeria and Kenya in the legal and regulatory frameworks for renewable electricity, the countries share some similarities in matters relating to electricity regulation. The positive provisions of Kenya's Energy Act, as highlighted above, provide lessons for Nigeria that could be adapted to suit Nigeria's situation. However, an aspect of Kenya's experience that should not be adopted by Nigeria is Kenya's approach to the liberalisation and current structure of the electricity sector. Although the involvement of the Kenyan state in the performance of electricity functions has assisted it to carry out RE projects, particularly in rural areas, re-involving the state in the performance of the electricity industry functions (generation and distribution) should be avoided in Nigeria. Instead, Nigeria should re-organise its electricity market in a way that increases private investors' willingness to invest in the electricity sub-sector, and should enact legislative reform to support private sector investment in renewables. For this reason, a direct transplantation of Kenya's Energy Act provisions on the uptake of RE, without modifications, may be counterproductive in Nigeria.

The use of REFIT has not met the energy security objectives of the two countries. Although a detailed consideration of the pros and cons of alterative mechanisms is beyond the scope of this thesis, Nigeria should consider introducing and implementing other mechanisms for promoting the uptake of RE, such net-metering, a renewable portfolio standard, renewable energy auctions, green mechanism, etc. to promote uptake of RE above the RE capacity for each technology in the REFiT.[743]

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[742] FMPWH (n 311) 13.

[743] Energy literature is replete with the advantages and disadvantages of adopting feed-in tariffs as a support mechanism for promoting the uptake of renewable energy. See, Crossley (n 183); Michael G. Smith and Johannes Urpelainen, 'The Effect of Feed-in Tariffs on Renewable Electricity Generation: An Instrumental

Having said this, the electricity architecture of Nigeria must also be reviewed to ascertain whether the electricity reform is yielding the desired result. The involvement of the private sector should be assessed based on the volume of investment that is coming into the sector. This should be carefully looked into with a view to favour investment in RE sources over fossil energy sources.

Variables Approach' (2014) 57 Environmental and Resource Economics 367; Tam Hunt, 'Feed-In Tariffs: A Tool for Increasing Economic Equality in the US?' *Wood Mackenzie Business* (28 October 2014) <https://www.greentechmedia.com/articles/read/Feed-in-Tariffs-A-Tool-for-US-Economic-Equality>.

CHAPTER 6

RECOMMENDATIONS AND CONCLUSION

6.1 Recommendations

This research has identified the challenges of electricity generation and access in Nigeria. The study further identified the potential of RE in boosting electricity generation in Nigeria and the challenges Nigeria is facing in its efforts to promote the uptake of RE. Having made a case for a new law in Chapter 5, this chapter will make a number of more specific recommendations to guide the drafting of the proposed law.

6.1.1 Mandatory Obligations

There should be mandatory obligations (a) to use RE in electricity generation; and (b) to purchase renewable-sourced electricity. The obligation to use RE should be imposed on the GenCos by specifying the minimum percentage of electricity that should come from RE sources. The law should impose a minimum percentage of RE uptake for electricity generation. As noted in Chapter 2, electricity producers will ordinarily avoid the use of RE because of the initial costs, hence the need for mandatory provisions to compel the use of RE.[744] The other side of the obligation is the obligation to purchase, which should be imposed on the DisCos. Imposing an obligation on the DisCos to purchase electricity generated from RE sources will serve as an assurance to the GenCos that there is going to be a market for renewable electricity. The current REFiT regulation whereby the mandatory obligation is shared between the NERC and the DisCos is not in the best interest of the country. The obligation should ensure that every megawatt of renewable electricity generated is purchased.

[744] See p. 33.

6.1.2 Clarity of Functions

The law should provide for clarity of functions among the electricity regulators. A sustainable use of RE for electricity is attainable when the responsibility for developing the use of renewables electricity and other connected functions are clearly spelt out among the relevant institutions. The proposed law should clearly define and assign the various responsibilities for developing RE so that the institutions know their respective duties in the chain of functions. Lack of clarity about the division of functions among the electricity stakeholders is one of the barriers to the uptake of RE in Nigeria and the proposed law should address it. The law should be couched so that questions of who does what will be apparent on the face of the law. The FMPWH and the NERC could retain their respective policy formulation and electricity regulation functions as they exist in the EPSR Act, while a new body could be created purposely for the development of RE for electricity generation and access. The role of the FMPWH could be strengthened to include promotion of RE for electricity generation so that, in carrying out its supervisory and policy formulation roles over other agencies, government policy on RE can easily be disseminated. The regulatory functions of the NERC could be extended to include monitoring compliance with provisions of the law and government directives on mandatory RE use. So, while the FMPWH articulates RE targets, the NERC will monitor compliance with law and the regulations.

On the need to establish a new body, this thesis recommends adopting the provisions of Kenya's New Energy Act on the establishment of REREC. The establishment of such an agency with a mandate to deploy RE particularly in rural areas could promote the application of off-grid electricity in Nigeria. The deployment of off-grid electricity, as it currently exists in Kenya, will reduce the need for grid expansion in Nigeria. The money that would have been expended on grid expansion could be used for research and development in RE technologies. In addition, the law should compel the agency to develop the individual RE resources available in different areas as a component of the integrated energy plan.

It is also important that information regarding the performance of each of the agencies responsible for RE development should be available for assessment. In this regard, the law could mandate the FMPWH to submit an annual report on the use and application of RE resources and technologies. Other agencies (such as NERC and the REA) may be directed to provide the FMPWH with information required for preparing the report. Apart from providing the basis for assessing performance, RE investors could make use of the report to assess the performance of Nigeria's RE market in making investment decisions.

6.1.3 REFiT Backed by Law

The REFiT must be provided for in legislation. While it may not be possible to have a REFiT law separate from the energy law, Nigeria could incorporate the REFiT regulation in the law, as is the case in Kenya. The current system whereby the regulation of the REFiT is derived from the regulatory powers of the NERC is not achieving Nigeria's renewable electricity objectives. Moreover, a change in the leadership of the NERC could lead to a change or an amendment to the regulation that is more unfavourable to RE. If the REFiT is part of the law, it will not be possible to change the regulation as a result of a change in the leadership of the NERC. The certainty will help to restore investors' confidence in Nigeria's electricity sector. According to AFUR, 'establishing a FIT through detailed legislation, for example, may provide greater investor certainty because the law may be viewed as more difficult to change than a policy enacted as a result of an executive branch or regulatory agency initiative'.[745] As stated above, Nigeria may need to redefine the roles of the NERC in relation to promotion of electricity from RE, so that the incorporation of the REFiT can achieve the desired objectives.

6.1.4 Incentives and other Support Mechanisms for Renewable Electricity

RE incentives and other support mechanisms should be specifically provided for in the law. Setting up renewable electricity plants is more expensive than using electricity from fossil

[745] AFUR, *Guidelines for Renewable Energy* (n 167) 17.

sources. RE-sourced electricity, therefore, requires some measure of support to make it affordable. Fiscal and economic incentives, and subsidies that apply to RE should be harmonised and incorporated into the law. The current practice where incentives for renewable electricity are contained as general incentives in other areas of law does not augur well for RE projects. This means that RE investors will have to find out first if a project will be eligible for a particular incentive. The eligibility of RE projects for the incentives should be spelt out to avoid uncertainty in the application of incentives.

Regarding subsidies, the GoN could channel them either to the GenCos to cover the generation costs or to the DisCos to reduce the retail electricity tariff. The GoN should put in place a transparent system for assessing the renewable electricity subsidies so as not to create another avenue for corrupt practices in the electricity industry. In addition to subsidies, the law could grant tax exemptions on equipment imported for the implementation of off-grid electricity. The tax exemptions will reduce the total cost of off-grid technologies. While fiscal/economic incentives will help to reduce the cost of producing renewable electricity, subsidies will apply to make electricity affordable to the population.

Nigeria should also develop guidelines for the operation of net-metering and competitive bidding, in addition to the REFiT. In theory, other tariff systems, such as net metering and competitive bidding, apply to renewable technologies above the REFiT threshold. The reality is that Nigeria has not developed a regulation either for net metering or competitive bidding. The development of more detailed guidelines or regulations for these mechanisms will ensure that there are supports for different capacities for RE technologies above the REFiT threshold. This will motivate the GenCos to produce more, and with the provision for a mandatory purchase obligation, there will be a market for the electricity produced. Ultimately, there will be supports for different capacities of RE technology.

6.1.5 The Rural Electrification Programme as Part of a Sustainable Development Program

The REP in Nigeria should be mainstreamed into the national economic development program and make REP a key component of SD. The current practice whereby the REP is being pursued as a separate program should be discontinued. In addition to this, the law should be designed in such a way that the REP will promote the use of off-grid electricity generation as a way of avoiding the need to expand the grid. The law should further specify the minimum component for RE in the execution of the REP projects. The GoN can support off-grid electricity generation through a number of incentives as discussed above. By adopting this approach to the REP, Nigeria will achieve more electricity access and fulfil one of its SD goals.

6.1.6 Prioritised Grid Connection and Access to Network

The law should ensure that connection of renewable-sourced electricity to the grid and access to the network are prioritised. The two important points here are – (a) priority dispatch (b) special connection to the network. Renewable electricity should have the privilege of priority of dispatch. In Nigeria, the connection of electricity to the grid is one the functions of the TCN and is currently being undertaken on a non-discriminatory principle. The priority dispatch for renewable electricity can be achieved by ensuring that the proposed law imposes on the TCN the obligation to dispatch electricity from RE-sourced electricity ahead of electricity from conventional sources. The law should set out the conditions a renewable energy technology should meet before it can be dispatched ahead of electricity from the conventional sources.

In addition to priority dispatch, a special connection regime should be established for renewable electricity different from the current law on access to network, which permits equal connection status for electricity from any sources. An important consideration in the area of connection in Nigeria is the issue of cost which should be done in a way that will not make electricity from RE sources unattractive. Since the TCN (a government-owned company) is the

owner of the transmission network, the connection costs could be fixed in a way that both the electricity generator and the TCN will bear the costs. This way, the burden of the costs of connection will not be borne to electricity consumers alone. GoN may also need to privatise the transmission network to make it more competitive and attractive to private investors.[746] In the alternative, the transmission network can be decentralised to enable state participation in the operation of the transmission network.[747]

As noted in Chapter 2, electricity from RE sources in Nigeria cannot compete favourably with electricity from fossil sources. Ensuring the existence of a priority dispatch (grid access) and the special connection for renewable electricity in the law will serve as a guarantee to investors that any electricity generated by them from RE sources will be to the grid and utilized.

Above all, in designing an RE law for Nigeria the guiding principle should be sustainable electricity generation, bearing in mind the peculiar circumstances of the country, and not what works for other countries. In view of this, this thesis does not recommend a direct transplant of the renewable electricity regime in Kenya's *Energy Act 2006* and the *New Energy Act* to Nigeria. Rather, the lessons from Kenya's experience should be carefully adapted and modified to fit into the Nigerian system so that the law, when enacted, will promote an enabling environment for the uptake of RE, and successful integration of the electricity reform and the regulatory structure.

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[746] PricewaterhouseCoopers (PwC), 'Privatisation in the power sector: Navigating the transition', *The Roundtable* (PwC, November 2012) 24 <https://www.pwc.com/ng/en/assets/pdf/pwc-round-table-post-privatisation.pdf>; Charles A Obiora, Amobi P Chiamogu and Uchechukwu P Chiamogu, 'Power Devolution and Electricity Transmission in Nigeria: A Study in Resources Mobilization for Economic Development' (2019) 6(4) *Advances in Social Sciences Research Journal* 339.

[747] Ndubuisi Ekekwe, Fixing *Nigerian Electricity Sector through Decentralization* (Tekedia 13 November 2017) https://www.tekedia.com/fixing-nigerian-electricity-sector-through-decentralization/; Ugochukwu Amasike, 'Federalism and Need for Decentralisation of Electricity Transmission', *ThisDay* (online) 10 June 2018 <https://www.thisdaylive.com/index.php/2018/06/10/federalism-and-need-for-decentralisation-of-electricity-transmission/>.

6.2 Conclusion

This thesis has established that SD requires SE, that is, the provision of affordable and environmentally friendly electricity that supports development at all times. Although the thesis has argued that it is essential that Nigeria implement an RE law, and has made a case for it based on Kenya's approach, this law is unlikely of itself to solve all of Nigeria's electricity challenges. There is a wide gap between the electricity generation capacity and demand, which will require substantial investment to bridge. As well as introducing an RE law, Nigeria also needs to consider using law to combine different SE strategies as a means of solving the electricity challenges, that is, to consider combining energy diversification with strategies to improve energy efficiency.

The adoption of technologies that reduce energy consumption or reduce emissions of greenhouse gases is an energy efficiency approach. The combination of energy efficiency with energy diversification will ensure that Nigeria can generate sufficient electricity to satisfy the country's energy requirements. Although a discussion of energy efficiency is outside the scope of this thesis, this thesis concludes by suggesting an examination of how laws to increase the uptake of RE can be combined with laws to improve energy efficiency. This is a crucial area for further research, if Nigeria's electricity challenges are to be successfully resolved.

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