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INTERROGATING THE IMPACT OF FEDERALISM ON CLEAN ENERGY TRANSITION: A COMPARATIVE STUDY OF NIGERIA, THE UNITED STATES OF AMERICA, AND AUSTRALIA

Damilola Joseph Anifowose* and Oluwaseye Oluwayomi Ikubanni**

ABSTRACT

The shift to clean energy sources from fossil fuels is critical and could be a challenge. However, this transition becomes even more complex in federal systems, where the interaction between the national and subnational governments creates unique challenges and also opportunities. This paper explored the dynamics of federalism in either facilitating or hindering the transition to clean energy. It focused on regulatory frameworks, policy approaches, and practical experiences in the USA and Australia. This paper also identified key challenges in this transition by looking at the case studies of the two countries. Additionally, this paper offered a comparative analysis with lessons and approaches that are particularly relevant to Nigeria and other federal nations, to achieve a sustainable clean energy transition. The research found that while federal structures present significant obstacles, they also provide opportunities for innovation and customized policy implementation toward a sustainable clean energy transition. Thus, the study recommended among others the need for a comprehensive national plan and advocates developing collaborative platforms for effective clean energy transition in Federal nations.

Keywords: Clean Energy; Climate Change; Federalism; Fossil Fuels; Greenhouse Emission

1. INTRODUCTION

Federalism is the system of government where power is divided between a central government (national) and its constituent parts (states or regions).[1]

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This decentralization can bring its own set of opportunities and challenges for the transition to clean energy.[2] Federal systems are highly decentralized, allowing for experimentation and adaptation to local peculiarities within an innovative framework.[3] This is particularly important to the clean energy sector, which requires tailored approaches and policies to grapple with diverse state energy landscapes and socio-economic realities.[4] However, according to Karapin federalism is not without its challenges. These challenges range from regulatory fragmentation to policy inconsistency which could arise as a result of possible frictions between the federalist institutions.[5] The increase in several decision-making levels could make policy outcomes more uncertain.

The Intergovernmental Panel on Climate Change states that to keep global warming to 1.5 degrees celsius, quick and significant adjustments must be made to the energy, land, urban infrastructure, and industrial systems.[6] As a result, reducing reliance on fossil fuels and mitigating climate change are essential priorities. However, in federal systems, policy coordination toward clean energy could be complicated because power and resources are distributed across multiple levels of government.[7] In other words, the Federalist structure can either aid or hinder the implementation of clean

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1 DJ Anifowose, 'Personal Income Tax and Fiscal Federalism in Nigeria: The Way Forward' (2024) 6 University of Port Harcourt Journal of Public Law; DJ Anifowose, OO Ikubanni, AO Oyebanji, GO Antai, M Okpoko, 'An Examination of Property Tax Within the Context of Fiscal Federalism in Nigeria' (2024) 9(2) NIU Journal of Humanities39-54, 15

2 J Saurer and J Monast, 'The Law of Energy Transition in Federal Systems' (2021) 10(2) Transnational Environmental Law 205-210.

3 Ibid.

4 J Saurer and J Monast, 'Renewable Energy Federalism in Germany and the United States' (2021) 10(2) Transnational Environmental Law 293

5 R Karapin, 'Federalism as a Double-Edged Sword: The Slow Energy Transition in the United States' (2020) 29(1) Journal of Environment & Development 26

6 M Allen and others, Global Warming of 1.5°C. 'An IPCC Special Report on the Impacts of Global Warming of 1.5°C above Pre-industrial Levels and Related Global Greenhouse Gas Emission Pathways, in the Context of Strengthening the Global Response to the Threat of Climate Change, Sustainable Development, and Efforts to Eradicate Poverty' Sustainable Development, and Efforts to Eradicate Poverty. (2018)

7 Saurer and Monast (n 2) 206

energy policies depending on the level of coordination and collaboration among the levels of government.[8]

According to Abramowicz and others,[9] one of the advantages of federalism in the clean energy transition is the ability to use the characteristics of different regions to create new policies. The states and provinces can be platforms to test different ways of implementing and regulating clean energy. For instance, in the United States of America (USA), California is leading the way on clean energy standards and carbon reductions and it is a model for other states or regions to follow.[10] Similarly, Germany's Energiewende policy has been successful due to the participation of its state (Länder) each utilizing unique strategies to support clean energy development.[11]

On the other hand, Wiseman and Owen[12] argue that policy experimentation should not be limited to the state level but should also include the federal government. They highlight the benefits of federal involvement in policy experiments which could provide a comparative advantage in policy experimentation.[13] Unfortunately, one of the major drawbacks of the federalist institution is its decentralized nature which can lead to regulatory fragmentation and policy inconsistency.[14] For example, in the USA, the lack of a cohesive national energy policy has resulted in a fragmented regulatory

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8 In Germany, it is argued that some states act as examples for others, while others argue that federalism complicates development due to varying state-specific concepts. Kerstine Appunn, 'German Federalism: In 16 States of Mind over the Energiewende' (Clean Energy Wire, 10 March 2016) https://www.cleanenergywire.org/factsheets/german-federalism-16-states-mind-over-energiewende accessed 14 April 2024.

9 M Abramowicz, I Ayres and Y Listokin, 'Randomizing Law' (2011) 159 University of Pennsylvania Law Review 929 (947) 952.

10 DA Mazmanian, JL Jurewitz and H T Nelson, 'State Leadership in US Climate Change and Energy Policy: The California Experience' (2020) 29(1) Journal of Environment & Development 51-74.

11 Komila Nabiyeva, 'Energiewende Movers: The Federal States' (Energy Transition, 12 December 2014) https://energytransition.org/2014/12/energiewende-movers-the-federal-states/ [accessed 14 April 2024].

12 HJ Wiseman and D Owen, 'Federal Laboratories of Democracy' (2018) 52 UC Davis Law Review 1119

13 Ibid.

14 Karapin (n 5) 26

landscape where clean energy developers must navigate various state-by-state policies and incentives.[15]

In Nigeria, despite the legal reforms aimed to decentralize the market and bring in the state governments as major stakeholders to promote clean energy sources through the enactment of the Electricity Act 2023 in June 2023, there is still a heavy reliance on fossil fuels.[16] Before the amendment of the Nigerian Constitution, even if they could enact laws in the regions outside the national grid, most states still lacked regulations addressing the energy sector. Except Lagos State which enacted the Lagos State Electric Power Sector Reform Law in 2018, no state in Nigeria has passed any law to regulate the energy sector. Even though the energy sector has now been decentralized by the Electricity Constitutional Amendment,[17] the implementation of the policies continues to be hindered by a lack of sincere commitment and a lack of a coherent plan to overhaul the fossil fuel-dependent energy sector.[18]

Despite these challenges, federalism provides opportunities for fostering stakeholder engagement and ensuring the transition to clean energy. By state governments actively getting involved, federal systems can ensure that clean energy policies are more inclusive and responsive to the needs of diverse populations. Canada's approach to energy policy is an example that includes extensive consultation with provincial governments and indigenous communities, aiming to balance economic development with environmental

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15 E Hutchins, 'Accelerating Clean Energy: A Road Map for Regulatory Reform' (2024) 54 Environmental Law Reporter 10114.

16 OJ Olujobi, UE Okorie, ES Olarinde, and AD Aina-Pelemo, 'Legal Responses to Energy Security and Sustainability in Nigeria's Power Sector amidst Fossil Fuel Disruptions and Low Carbon Energy Transition' (2023) 9(7) Heliyon 1-24

17 The wording "not covered by a national grid system" was removed from paragraph 14(b) of the Concurrent Legislative List as it was described in Part II of the Second Schedule to the 1999 Constitution. This Followed His Excellency, President Muhammadu Buhari GCFR's assent to the Act to amend certain provisions of the 1999 Constitution of the Federal Republic of Nigeria one of which is the Fifth Alteration (No.33) Devolution of Powers (National Grid System) Bill (the "Constitutional Amendments") which came into force on March 17, 2023.

18 Olujobi Olusola Joshua, Olujobi Oluwatosin Michael, and Daniel E Ufua, 'The Legal Regime on Renewable Energy as Alternative Sources of Energy in Nigeria's Power Sector: The Impacts and the Potentials' (2020) 19(3) Academy of Strategic Management Journal 1-19, 1

protection and social equity.[19] While federalism simultaneously presents both challenges and opportunities for the transition to clean energy, the potential for policy innovation, stakeholder engagement, and localized solutions can be harnessed to drive progress in this area. However, the achievement of an effective transition would require addressing the issues of regulatory fragmentation and policy inconsistency through enhanced coordination and committed collaboration across all levels of government.[20]

While there is a substantial body of literature on the experiences of some federal countries' transition to clean energy, there is limited attention to the comparative analysis of effective intergovernmental coordination. Specifically, there is limited attention given to how federal and subnational policies can be effectively coordinated and aligned to foster cohesive and efficient clean energy transitions within federal systems. This paper aims to fill this gap particularly pronounced in the context of developing federal nations like Nigeria.

This paper explores federalism and the transition to clean energy with a focus on Nigeria, the USA, and Australia as a case study. By examining this case study, we aim to extract lessons on the opportunities and challenges of a federalist structure. By leveraging lessons drawn from these experiences, the objective is to offer tailored recommendations for Nigeria and other federal countries as they navigate the transition to a sustainable energy future. This paper will look at the regulatory frameworks for clean energy in these countries as federal countries. It will examine the allocation of powers, existing policy approaches, and practical experiences here, to gain an understanding of the opportunities and challenges in the federalist structure about the transition to clean energy.

2. UNDERSTANDING THE CONCEPT OF FEDERALISM AND CLEAN ENERGY TRANSITION

2.1 Federalism

Federalism connotes the division of political power between a central government and subnational entities, such as states or provinces except

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[19] JL MacArthur, CE Hoicka, H Castleden, R Das, and J Lieu, 'Canada's Green New Deal: Forging the Socio-Political Foundations of Climate Resilient Infrastructure?' (2020) 65 Energy Research & Social Science 101442.

[20] Saurer and Monast (n 2) 207

concurrent powers which both levels of government have powers over.[21] According to Ayoade, federalism emerged as a sophisticated political instrument tailored to reconcile diversity within a unified political entity or, conversely, to facilitate oversight across expansive territories. [22] Wheare describes it as a constitutional framework delineating the distribution of legislative powers and functions between distinct tiers of government. [23] Central to his perspective is the delineation of powers in a manner that bestows coordinated and independent authority upon both central and regional governments within their respective spheres. McMillan highlights its core premise which is the intricate amalgamation of national and regional interests within a sophisticated framework of checks and balances. This arrangement he believes delineates a robust interaction between a central or federal government, on one hand, and a multitude of regional governing entities on the other. [24]

However modern interpretations of federalism like Cooperative federalism have evolved to address the complexities of contemporary governance which highlights the interdependence and the need for collaborative efforts between national and subnational governments. Learned scholar Wiseman emphasized that cooperative federalism is important, especially in areas of policy issues that go beyond state lines that also require tailored solutions.[25] This model recognizes that in an increasingly interconnected world, policy issues such as environmental regulation, require coordinated efforts across different levels of government.

Critiques of federalism like Professor Kettl often focus on the potential for inefficiency and conflict inherent in a system with multiple levels of government.[26] Critics argue that federalism can lead to duplication of efforts, inconsistent policies, and jurisdictional disputes. Moreover, the balance of power between central and subnational governments is frequently contested, leading to legal battles and political strife. Despite these challenges, federalism

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21 JF Zimmerman, Contemporary American Federalism: The Growth of National Power (SUNY Press 2009) 4

22 JAA Ayoade, Nigeria: A Nation of States or a State of Nations (Ibadan: John Archers, 2020) 3.

23 KC Wheare, Federal Government, 4th Edition (London: Oxford, 1963) 10.

24 I McLean and A McMillan, Oxford Concise Dictionary of Politics (New York: Oxford University Press, 2003) 195.

25 HJ Wiseman, 'Regional Cooperative Federalism and the US Electric Grid' (2022) 90 Geo Wash Law Review 147

26 DF Kettl, The Divided States of America: Why Federalism Doesn't Work (Princeton University Press 2022)

offers significant benefits, including the ability to tailor policies to local needs and promote innovation through experimentation at the subnational level.

2.2 Clean Energy Transition

Clean energy is defined as energy resources that can meet current energy needs without jeopardizing the capacity of future generations to meet their own energy needs.[27] The United Nations Secretary-General, António Guterres describes the urgency in the clean energy transition by stating that "the climate bomb is ticking."[28] This shows the urgency with which the issue of clean energy transition should be addressed. Reducing greenhouse gas emissions into the atmosphere and lessening the effects of climate change need the adoption of clean energy solutions.[29] Clean energy increases energy independence and security of supply by reducing dependency on fossil fuels.[30]

Kandpal and others explained that the clean energy transition represents a fundamental shift from fossil fuel-based energy systems and to renewable, sustainable energy sources like wind, solar, and hydropower.[31] The framework for understanding the clean energy transition encompasses several key dimensions which according to Capodagilo involve technological innovation, policy and regulatory frameworks, economic incentives, and social acceptance.[32] Funcke and Ruppert-Winkel also emphasized the role of

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[27] Lv Y, 'Transitioning to Sustainable Energy: Opportunities, Challenges, and the Potential of Blockchain Technology' (2023) 11 Frontiers in Energy Research 1258044.

[28] H Lee, K Calvin, D Dasgupta, G Krinner, A Mukherji, P Thorne, P, ... & Y Park, , IPCC, 2023: Climate Change 2023: Synthesis Report, Summary for Policymakers (Contribution of Working Groups I, II and III to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change [Core Writing Team, H Lee and J Romero (eds.)], IPCC 2023).

[29] Ibid 27.

[30] Ibid.

[31] V Kandpal, A Jaswal, EDR Santibanez Gonzalez, and N Agarwal, 'The Economics of Sustainable Energy Transition and the Circular Economy' in Sustainable Energy Transition. Circular Economy and Sustainability (Springer, Cham 2024) https://doi.org/10.1007/978-3-031-52943-6_2.

[32] AG Capodaglio, A Callegari and MV Lopez, 'European Framework for the Diffusion of Biogas Uses: Emerging Technologies, Acceptance, Incentive Strategies, and Institutional-Regulatory Support' (2016) 8 Sustainability 298.

technological innovation[33] while Wustenhagen and others mentioned the dimension of social acceptance [34] and Abbruzzese emphasized the role of economic incentives.[35] The emphasis of this paper however is on policy and regulatory frameworks because it ties other dimensions together and is also essential in creating the enabling environment for clean energy adoption. Popp and others for example argue that environmentally friendly innovation is better induced by market-based policies. [36]

International agreements play a critical role in shaping national and subnational energy policies. According to Olujobi and others, in alignment with Sustainable Development Goal (SDG) 7 which focuses on hygienic, affordable, and accessible energy, the Paris Agreement was adopted in 2015, as a landmark international treaty that aims to limit global warming.[37] Signatories to the Paris Agreement commit to reducing greenhouse gas emissions and transitioning to low-carbon energy sources.[38] This international framework sets the stage for national policies and provides a benchmark for measuring progress in the transition to clean energy.

National energy policies are essential for setting the direction and priorities for energy transition within a country. These policies typically include targets for renewable energy adoption, incentives for clean energy technologies, and regulations to reduce carbon emissions. These national policies provide a framework for subnational governments to develop their own initiatives in alignment with national goals.

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[33] S Funcke and C Ruppert-Winkel, 'Storylines of (De)centralisation: Exploring Infrastructure Dimensions in the German Electricity System' (2020) 121 Renewable and Sustainable Energy Reviews 109652.

[34] R Wüstenhagen, M Wolsink, and MJ Bürer, 'Social Acceptance of Renewable Energy Innovation: An Introduction to the Concept' (2007) 35 Energy Policy 2683.

[35] M Abbruzzese, D Infante & J Smirnova, The diffusion of renewable energy production in European countries: the role of incentives (2024) Economics of Innovation and New Technology, 1-24.

[36] D Popp, RG Newell, and AB Jaffe, 'Energy, the Environment, and Technological Change' in BH Hall and N Rosenberg (eds) (2010) 2 Handbook of the Economics of Innovation 873-937

[37] OJ Olujobi, UE Okorie, ES Olarinde, and AD Aina-Pelemo, 'Legal responses to energy security and sustainability in Nigeria's power sector amidst fossil fuel dis rupttions and low carbon energy transition' (2023) 9(7) Heliyon

[38] Ibid.

Rabe has emphasized the role of subnational initiatives as critical in the transition to clean energy, particularly in federal systems where states or provinces have significant autonomy over energy policy.[39] Subnational governments can implement innovative policies and programs tailored to local conditions and needs. Moreover, a report by the International Renewable Energy Agency (IRENA) underscores the need for comprehensive policy frameworks and regulatory measures to achieve a successful clean energy transition.[40] Oladiran Olajiga and others[41] emphasized the significant role of government policies in accelerating clean energy adoption in various countries

Dorte Ohlhorst claims that in a federal country like Germany, states that prioritize an internally driven strategy and push for more coordination efforts run the danger of experiencing higher inefficiencies and macroeconomic costs. He argues that converging national and subnational energy policies is essential in a multilevel governance framework.[42] On the other hand, Kerstin Tews contends that in a federal setting, there is still a need for less harmonized policies to allow for appropriate creative experimentation given the different member states' preferences.[43]

3. LEGAL AND REGULATORY FRAMEWORK OF NIGERIA'S CLEAN ENERGY TRANSITION.

Federalism serves as the foundational principle of Nigeria's governance structure, with authority divided among the three tiers of government: federal, state, and local.[44] Each tier carries distinct powers and duties, as

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[39] BG Rabe, Statehouse and Greenhouse: The Emerging Politics of American Climate Change Policy (Rowman & Littlefield 2004).

[40] International Renewable Energy Agency (IRENA), World Energy Transitions Outlook 2022 (IRENA 2022)

[41] Oladiran Kayode Olajiga, Igberaese Clinton Festus-Ikhuoria, Rilwan Adekola Adebayo, Nwankwo Constance Obiuto, 'Sustainable Development and Renewable Energy Policy: A Review of Global Trends and Success Stories' (2024) 4(2) International Journal of Advanced Multidisciplinary Research and Studies 648, 656

[42] D Ohlhorst, 'Germany's Energy Transition Policy Between National Targets and Decentralized Responsibilities' (2015) 12 Journal of Integrative Environmental Sciences 303.

[43] K Tews, Europeanization of energy and climate policy: The struggle between competing ideas of coordinating energy transitions (2015) 24(3) The Journal of Environment & Development 267-291.

[44] Anifowose (n 1).

stipulated in the 1999 Constitution of the Federal Republic of Nigeria (CFRN).[45] This division significantly impacts the formulation, execution, and regulation of policies within the nation. The constitutional framework establishes the structure within which clean energy policies are developed and implemented. Even though both the federal and state governments have jurisdiction over energy matters, states have generally been passive in their engagement with clean energy initiatives.[46] The legislative authority of States regarding the generation, transmission, and distribution of electricity was significantly restricted. Thus, states were only permitted to enact laws concerning activities in areas not served by the national grid system.[47]

The Electricity Constitutional Amendment addressed this issue by removing existing constitutional limitations that previously limited States' legislative powers outside the national grid system making way for the enactment of the Electricity Act 2023.[48] Despite the gains achieved with the Electricity Law 2023 and the Climate Change Act 2021, challenges remain, and more tailored strategies and practical commitment are needed for the clean energy transition in Nigeria. Valuable lessons can be gleaned from the USA and Australia, particularly regarding enhanced federal and state cooperation, political will, and proactive measures by independent states. These findings can inform Nigeria's clean energy transition and the development of its legal and regulatory framework for a more effective and sustainable approach.

3.1 The Constitution of the Federal Republic of Nigeria, 1999

The Constitution of the Federal Republic of Nigeria, 1999 provides that the federal government has exclusive legislative authority over specific areas, such

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45 CFRN 1999 (as amended) Part I and II, Second Schedule; S 4(7) and Fourth Schedule. See also Anifowose Damilola Joseph, 'The Taxing Power of Value Added Tax and Fiscal Federalism in Nigeria: The Path Ahead' (2023) 4(1) African Journal of Law, Ethics and Education 92

46 OJ Olujobi (n 18) 10

47 UM Ukponu, Y Sulayman and K Oyibo, 'Role of Law in the Energy Transitions in Africa: Case Study of Nigeria's Electricity Laws and Off-Grid Renewable Energy Development' in Energy Transitions and the Future of the African Energy Sector' (2021) Law, Policy and Governance 141-188

48 Raymond Ofagbor and Ndentuokid Essang, 'Legal and Commercial Implications of the Electricity Act, 2023 for the Nigerian Electricity Supply Industry (NESI)' https://www.aelex.com/legal-and-commercial-implications-of-the-electricity-act-2023/ accessed 4 June 2024

as oil fields and minerals.[49] However, about electricity, both the federal government and state government have concurrent legislative power that allows them to legislate on matters related to energy. The hope is that this would enable the states to enact laws complementing federal policies and help them meet their specific electricity needs.[50]

Although both the federal and state legislatures share concurrent powers in relation to electricity, the authority of the federal government to make laws on these matters is limited to those items specifically listed in the first column of Part II of the Second Schedule.[51] The concurrent legislative list in paragraphs 13 and 14 provides that state assemblies can make laws relating to the establishment, management, transmission, and distribution of electricity within their states, while the National Assembly is empowered to make laws on various aspects of electricity at the federal level. However, there was an initial significant regulatory vacuum since states were not allowed to make laws on electricity within areas already covered by the national grid.[52] Despite having the authority to legislate for areas outside the grid, many states still chose not to do so. Nevertheless, the restriction has been removed by the Electricity Constitutional Amendment which now empowers states to legislate on electricity matters, including those within the national grid.[53]

Furthermore, the court in the case of A.G. Federation v A.G. Lagos state[54] held that the residual power grants state governments the authority to legislate on matters not explicitly assigned to either level of government.[55] Clean energy initiatives like solar installations, fall within this power allowing states some autonomy in driving local energy transitions since they are not within the exclusive and concurrent list.

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49 CFRN 1999 (as amended), Item 39, Exclusive Legislative List of the Second Schedule.

50 Ibid, Paragraphs 13 and 14 of the Concurrent Legislative List, part II Second Schedule.

51 Anifowose Damilola Joseph, 'The Taxing Power of Value Added Tax and Fiscal Federalism in Nigeria: The Path Ahead' (2023) 4(1) African Journal of Law, Ethics and Education 92

52 Ukponu (n 47) 144

53 Raymond Ofagbor and Ndentuokid Essang, 'Electricity Act 2023 and the Nigerian Electricity Supply Industry (NESI)' BusinessDay (23 November 2023) https://businessday.ng/news/legal-business/article/electricity-act-2023-and-the-nigerian-electricity-supply-industry-nesi/ accessed 14 May 2024.

54 LPELR-7886 (2012) (CA)

55 Constitution of the Federal Republic of Nigeria 1999 s 4 (7a).

3.2 The Electricity Act, 2023

The Electricity Act of 2023, which repealed the Electric Power Sector Reform Act (EPSRA) 2005, provides additional support for clean energy initiatives. This Act fosters private sector participation, encourages competition, and facilitates tariff regulation and dispute resolution. It signifies a pivotal advancement in Nigeria's legislative framework governing the power sector, marking a substantial improvement over the EPSRA.[56] Key features of the Electricity Act,[57] include comprehensive mandates for renewable energy, simplified licensing processes, and decentralized regulatory authority to empower Nigerian states.

One of the main objectives of the Electricity Act,[58] is to acknowledge all sources involved in generating, transmitting, and distributing electricity, including incorporating renewable energy into Nigeria's energy mix.[59] The repealed EPSRA was drafted in a way that nearly eliminated all the constitutional authority of states to regulate electricity. Consequently, the Electricity Act,[60] represents a transformative shift in the regulatory framework governing Nigeria's electricity sector. Building upon the foundation laid by the EPSRA 2005, this new legislation introduces several pivotal changes aimed at enhancing regulatory oversight, particularly in renewable energy and decentralized regulatory authority as states may implement comprehensive regulatory frameworks, including sections on licensing, market operations, and renewable energy obligations specific to their needs.[61] We would further consider an overview of the primary regulatory entities under the Electricity Act of 2023:

3.2.1 Nigerian Electricity Regulatory Commission (NERC)

As it did under EPSRA 2005, NERC is still the primary regulating body for the electricity industry. In addition to making sure that the national electricity policy—which now includes specific objectives for integrating clean energy, NERC's authority to oversee the generation, transmission, distribution, and trading of power at the national level remains.[62] NERC is also in charge of monitoring the application of feed-in tariffs and other

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56 EPSRA, 2004.
57 Electricity Act, 2023.
58 Ibid.
59 Ibid, explanatory memorandum.
60 Ibid.
61 Electricity Act 2024, s 15 and 22.
62 Ibid, s 5.

financial incentives to encourage investment in renewable energy projects, as well as enforcing renewable generating and purchase responsibilities for electricity producing and distribution businesses.[63] Furthermore, it continues its role in issuing licenses for electricity generation, transmission, and distribution, simplifying the licensing process for renewable energy projects to facilitate quicker approvals and compliance monitoring.[64] Finally, it also stated the role of NERC's in protecting consumer rights and resolving disputes within the electricity market.[65]

3.2.2 Rural Electrification Agency (REA)

The Electricity Act greatly broadens the REA's scope by placing more emphasis on rural electrification initiatives and clean energy sources. According to the Act, REA is responsible for creating and assisting with rural electrification projects, especially those that make use of clean energy sources. To achieve this, it has to be carried out by organizing financial resources and offering technical support to make sure that isolated areas have a steady and sustainable supply of electricity.[66] Additionally, the Electricity Act requires that the REA cooperate closely with Nigerian Electricity Regulatory Commission and other state regulatory bodies in order to include clean energy into rural electrification projects.[67] This collaboration is meant to make sure that these projects are both environmentally sustainable and cost effective. Lastly and importantly, the Act highlighted the role of REA in capacity building and community engagement, training local communities and stakeholders to ensure the long-term success and sustainability of rural electrification projects.[68]

3.2.3 State Regulatory Authorities

The different state governments are now able to create their regulatory bodies to oversee the production, distribution, and transmission of energy within their states for the first time. The Electricity Act gives states the authority to regulate their electricity sectors by establishing state regulatory authorities.[69] Furthermore, the Electricity Act mandates state regulatory bodies to regulate state-specific electricity markets, ensuring fair competition, reliable service

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63 Ibid, s 12.
64 Ibid, s 8
65 Ibid, s 18.
66 Ibid, s 30.
67 Ibid, s 32.
68 Ibid, s 34.
69 Ibid, s 20.

delivery, and addressing local energy needs more effectively.[70] The Act also assigns state regulatory commissioners the responsibility of stimulating investments in clean energy projects and implementing clean energy regulations.[71] This targeted strategy aims to solve specific state energy issues and boost local markets for clean energy. Finally, the Electricity Act designates state regulatory bodies as the primary entities responsible for addressing consumer grievances and ensuring service quality within each state.[72]

The Electricity Act gives the Federal Ministry of Power the responsibility to create and revise the country's energy strategy, with emphasis on expanding access to energy and clean energy sources.[73] By doing this, Nigeria's energy strategy would remain current and aligned with international standards. It also emphasizes the importance of the Ministry of Power working in tandem with the REA, NERC, and state regulatory agencies to guarantee that federal laws and regulations are implemented consistently and cohesively.[74] Furthermore, it outlines the Ministry's responsibility to facilitate international partnerships to get financing for electricity projects at the state and federal levels.[75] It must be stated that the integrated plan for electricity governance in Nigeria is dependent on the cooperation among these institutions (NERC, REA, and Ministry of Power.

4. UNITED STATES OF AMERICA AND THE CLEAN ENERGY TRANSITION

The United States shows how the complexities of clean energy transition within a federal framework can be. It is noteworthy that while the federal government sets general broad energy policy objectives and provides funding for research and development,[76] the different states have great regulatory autonomy. This decentralized approach has led to disorganized clean energy initiatives across the country, with some states leading the way with

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70 Ibid, s 24.
71 Ibid, s 26.
72 Ibid s 28.
73 Ibid s 40.
74 Ibid section 42.
75 Ibid section 44.
76 President Biden's Executive Order 14057 aims to catalyze American clean energy industries and jobs through Federal sustainability. https://www.sustainability.gov/federalsustainabilityplan/ Accessed 14 May 2024.

ambitious renewable energy targets and carbon pricing mechanisms, while others are trailing behind. An example is California which stands out in clean energy innovation in the US.[77] However, generally, achieving cooperation and alignment among states is still challenging due to the diversity of policies and regulatory frameworks in its federalist structure. Despite these challenges, significant progress has also been made in its transition to clean energy.

4.1 Regulatory Framework

While the US Constitution does not explicitly address energy, several other provisions impact energy policy. For instance, the Commerce Clause confers on Congress the authority to regulate interstate commerce which includes the energy markets, transmission lines, and cross-state electricity trade.[78] Federal agencies such as the Federal Energy Regulatory Commission (FERC) oversee interstate energy markets to ensure compliance with federal regulations.[79] Also, the Tenth Amendment reserves powers not delegated to the federal government to the states, affording them authority over intrastate energy matters, including land use, other environmental regulations, and utility oversight.[80] Legislation at the federal level gives states flexibility in implementing clean energy policies but also provides a national framework for them.

The current move to clean energy policy began with the Public Utility Regulatory Policies Act (PURPA), which was part of the National Energy Act of 1978. It encouraged clean energy development by requiring utilities to buy power from approved facilities at avoided-cost rates.[81] PURPA would over time be replaced by the Renewable Portfolio Standard (RPS), which became popular among the different states for its efficiency and clarity.[82] Depending upon compliance with the RPS, utilities are recompensed through tax rebates with renewable energy credits (RECs), which are essentially

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77 California Governor's Office, 'Governor Newsom Updates the Roadmap to California's Clean Energy Future' (Published: May 25, 2023) https://www.gov.ca.gov/2023/05/25/governor-newsom-updates-the-roadmap-to-californias-clean-energy-future/ (accessed 15 May 2024).

78 United States Constitution, Art. I, s 8 (Commerce Clause).

79 Federal Energy Regulatory Commission (FERC), 'What FERC Does' https://www.ferc.gov/what-ferc-does (accessed 15 May 2024).

80 United States Constitution, Amendment X.

81 LL Davies, 'Eulogizing Renewable Energy Policy' (2018) 33 (2) Journal of Land Use & Environmental Law 312

82 Ibid 312

financial instruments utilities purchase when acquiring renewable power facilities.[83] However, the RPS is not without controversy, as states with smaller markets for clean energy worry that a comprehensive national policy would unfairly penalize them.[84]

Similarly, the Energy Policy Act of 2005 (EPAct)[85] promotes energy efficiency, renewable energy, and alternative fuels through the Renewable Portfolio Standard (RPS).[86] Additionally, the Clean Air Act (CAA)[87] regulates greenhouse gas emissions and other forms of air pollution, with the emission regulations for cars and power plants established by the Environmental Protection Agency (EPA).[88] Through state implementation plans (SIPs), states carry out CAA regulations guaranteeing adherence to federal air quality standards.[89] Furthermore, the Energy Independence and Security Act of 2007 further promotes energy efficiency, clean energy, and biofuels, thus establishing efficiency standards for appliances, lighting, and federal buildings, and expanding the Renewable Fuel Standard (RFS).[90]

At the state level, initiatives play a pivotal role in driving clean energy adoption and innovation, by implementing policies tailored to the state's unique circumstances and priorities.[91] With its Renewable Portfolio Standard (RPS), California has set high standards for itself, intending to achieve 100% clean energy by 2045 and leading the way in solar installations, the adoption of electric vehicles, and energy storage.[92] In a similar way, Texas has also

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83 Ibid

84 Ibid 313

85 Energy Policy Act 2005 (US), Pub L No 109-58.

86 Shirley Neff, 'Review of The Energy Policy Act of 2005' (2005) Adjunct Research Scholar, Columbia University https://www.beg.utexas.edu/files/cee/legacy/2005/Highlights%20of%20the%20Energy%20Bill.pdf accessed 15 May 2024.

87 Clean Air Act (CAA) 1993.

88 Philip A. Wallach, 'U.S. Regulation of Greenhouse Gas Emissions' (Brookings Governance Studies, October 2012) https://4cleanair.org/wp-content/uploads/Documents/26climatechangewallach.pdf accessed 15 May 2024.

89 Ibid 5.

90 U.S. Congress, Energy Independence and Security Act of 2007, Public Law No 110-140.

91 David Popp, 'Promoting Clean Energy Innovation at the State and Local Level' (2020) 49(2) Agricultural and Resource Economics Review 360-373 https://doi.org/10.1017/age.2020.15 accessed 15 May 2024.

92 MIKE O'Boyle, Eric Gimon, and Dan Esposito, 'Achieving an Equitable and Reliable 85 Percent Clean Electricity System by 2030 in California' (2022).

embraced deregulation in its electricity market, allowing consumers to choose their providers, and has made big investments in wind energy, making it also a national leader in clean energy production.[93] These state initiatives complement federal efforts and demonstrate the variety of approaches to promoting clean energy goals across the United States.

4.2. Policy Approaches by the United States for the Transition to Clean Energy

Tax incentives have been a major area for federal policy involvement since they are a major factor in clean energy adoption. These incentives do encourage creativity in addition to making wider the market base while promoting investment into projects related to clean energy. Notable among these tax policies is the Investment Tax Credit (ITC) which encourages the use of solar energy across the country by offering a tax credit for qualified renewable energy projects, such as solar, wind, and geothermal installations. [94] Additionally, there is the Production Tax Credit (PTC) that encourages the expansion of clean energy production from sustainable energy sources including hydropower, biomass, and wind.[95]

Another significant area of federal involvement is funding through research funding and innovation initiatives. Inflation Reduction Act (IRA) of 2022 gives almost 400 billion US dollars in federal funding to clean energy initiatives, which is expected to rise to above 70 billion US dollars that have already been spent on clean energy technology and demonstration projects under the Bipartisan Infrastructure Law (BIL)[96] all in a bid to incentivize clean energy transition.[97] The agencies like the Department of Energy (DOE) are also copartners of these programs which through their departments like

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93 JA Cohn, Large-Scale Renewables and Infrastructure Gatekeepers: How Local Actors Shaped the Texas Competitive Renewable Energy Zones (CREZ) Initiative' in Electrical Conquest: New Approaches to the History of Electrification (Springer Nature Switzerland, Cham 2024) 173-207

94 Pei Zhai, 'Analyzing solar energy policies using a three-tier model: A case study of photovoltaics adoption in Arizona, United States' (2013) 57 Renewable Energy 317-322.

95 Saurer and Monast (n 4) 295

96 Infrastructure Investment and Jobs Act of 2021

97 Adam Barth, Karina Gerstenschlager, Ksenia Kaladiouk, and Adi Kumar, 'How US states can advance a successful clean-energy transition' (29 January 2024) McKinsey & Company https://www.mckinsey.com/industries/public-sector/our-insights/how-us-states-can-advance-a-successful-clean-energy-transition accessed 10 May 2024.

Advanced Research Projects Agency-Energy (ARPA-E) and the Office of Energy Efficiency and Renewable Energy (EERE) take the lead in research and development of the various clean energy sectors.[98] Moreover, national laboratories in the US that are part of a global collaboration with other partners, are striving to lead the way in developing clean energy technology.[99]

Federal policies are designed to provide a general framework, but it is at the state level where the implementation process is carried out. States employ various measures tailored to their unique circumstances and priorities. Renewable Portfolio Standards (RPS), for example, is an example of a good policy that requires utilities to rely on clean energy. The state of California's aggressive RPS objectives is a good illustration of how important state regulations are in playing a great role in the transition to clean energy.[100]

One more thing to note is that the state itself shapes its own energy mix by the use of some regulatory measures that influence these areas which include power plant siting, in-state transmission, local distribution, and retail electricity rates. As pointed out by Saurer and Monast, states are using regulatory mechanisms like ratemaking, siting and permitting laws, tax laws and environmental and public health laws to directly shape their energy landscape.[101] For example, twelve states including Hawaii, Massachusetts, California, and New Jersey have passed legislation that bans the construction of new nuclear power plants,[102] and Washington, New York and Maryland amongst others also have laws that prohibit oil and natural gas extraction by

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98 Varun Sivaram et al, 'Energizing America: A Roadmap to Launch a National Energy Innovation Mission' (2020) https://www.energypolicy.columbia.edu/sites/default/files/file-uploads/EnergizingAmerica_111622-DIGITAL.pdf accessed 10 May 2024.

99 An example is the National Renewable Energy Laboratory (NREL), which conducts cutting-edge research in areas such as solar energy, wind power, grid integration, and energy storage. see https://www.energy.gov/eere/articles/nrel-study-identifies-opportunities-and-challenges-achieving-us-transformational-goal accessed 10 May 2024.

100 California Energy Commission, 'New Data Indicates California Remains Ahead of Clean Electricity Goals' (22 February 2022) https://www.energy.ca.gov/news/2022-02/new-data-indicates-california-remains-ahead-clean-electricity-goals accessed 10 May 2024.

101 Saurer and Jonas Monast (n 4) 310

102 National Conference of State Legislatures, 'States Restrictions on New Nuclear Power Facility Construction' (28 September 2023) https://www.ncsl.org/environment-and-natural-resources/states-restrictions-on-new-nuclear-power-facility-construction accessed 12 June 2024.

hydraulic fracturing.[103] There are however other numerous federal and state policies set up to promote initiatives targeted at improving energy efficiency, modernizing the grid, and encouraging the use of clean energy sources.[104]

4.3 Experiences in the United States Toward Clean Energy

In the United States, there are significant collaborations between the federal government and the state government. The Natural Gas Act,[105] for example, grants the Federal Energy Regulatory Commission (FERC) authority to site interstate natural gas pipelines. While states may incentivize the construction and operation of nuclear power plants, the Federal Nuclear Regulatory Commission issues operating licenses and governs reactor operations.[106] Also, the Environmental Protection Agency (EPA) and the Department of Energy (DOE) work together with the state governments. One significant part of the collaboration lies in the Weatherization Assistance Program which supports lower-income families by increasing energy efficiency through insulation, weather sealing, and appliance upgrades.[107] Similarly, federal agencies work hand in hand with states to accelerate renewable energy deployment, including solar, wind, and geothermal projects.[108] The Solar Energy Technologies Office collaborates with state governments to streamline

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103 Chloe Marie, 'Oregon and Washington Enact Hydraulic Fracturing Bans' https://aglaw.psu.edu/shale-law-in-the-spotlight/oregon-and-washington-enact-hydraulic-fracturing-bans/#:~:text=Washington%20and%20Oregon%20join%20the,the%20drilling%20of%20unconventional%20wells accessed 12 June 2024

104 Adam Barth, Karina Gerstenschlager, Ksenia Kaladiouk, and Adi Kumar, 'How US states can advance a successful clean-energy transition' (29 January 2024) McKinsey & Company https://www.mckinsey.com/industries/public-sector/our-insights/how-us-states-can-advance-a-successful-clean-energy-transition accessed 10 May 2024.

105 Natural Gas Act of 1938, 15 U.S. Code § 717f.

106 Saurer and Monast (n 4) 315

107 U.S. Department of Energy, Office of State and Community Energy Programs, 'Weatherization Assistance Program' https://www.energy.gov/scep/wap/weatherization-assistance-program accessed 15 May 2024.

108 Office of Energy Efficiency & Renewable Energy, 'Federal Geothermal Partnerships' https://www.energy.gov/eere/geothermal/federal-geothermal-partnerships accessed 15 May 2024.

permitting processes, improve grid integration, and to support technological innovations in solar energy.[109]

The solution to balancing diverse state priorities, economic considerations, and environmental goals necessitates the federal government provision of technical assistance, sharing of best practices, and facilitation of interstate cooperation, exemplified by regional initiatives like the Regional Greenhouse Gas Initiative among the states of the United States North East.[110]

5. AUSTRALIA CLEAN ENERGY TRANSITION

The division of powers between the Commonwealth and the six states and two territories creates equal challenges in the transition to clean energy.[111] The country's abundant natural resources, which include coal, gas, and renewable energy sources, have historically shaped its energy landscape. While the federal government retains authority over national energy policy, states play a significant role in regulating electricity markets and clean energy projects.[112] However, Australia's energy transition has been hampered by political coordination difficulties between state and Commonwealth governments,[113] insufficient policy development, unresolved conflicts

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[109] Office of Energy Efficiency & Renewable Energy, 'Solar Energy Technologies Office', https://www.energy.gov/eere/solar/solar-energy-technologies-office accessed 15 May 2024.

[110] The Regional Greenhouse Gas Initiative (RGGI) is a successful regional cap-and-trade program involving nine states in the Northeastern United States. It focuses on reducing greenhouse gas emissions from the power sector. RGGI demonstrates how collaboration across state boundaries can achieve environmental goals while considering economic impacts. Congressional Research Service, 'The Regional Greenhouse Gas Initiative: Background, Impacts, and Selected Issues' (16 July 2019) https://crsreports.congress.gov/product/pdf/R/R41836 accessed 15 May 2024.

[111] Alan Fenna, "Commonwealth–state relations" (2024) Australian Politics and Policy.

[112] Alan Fenna, "Climate Governance and Federalism in Australia" in Climate Governance and Federalism: a Forum of Federations comparative policy analysis (Cambridge University Press, 2023).

[113] Michael Slezak, 'Australia's politics only barrier to clean energy system, report finds' (The Guardian, 4 October 2017) https://www.theguardian.com/australia-news/2017/oct/05/australias-politics-only-barrier-to-clean-energy-system-report-finds accessed 16 May 2024.

between industry development and emission reduction goals.[114] In spite of these challenges, Australia has made significant strides in adopting clean energy technologies and reducing carbon emissions.[115] The transition to clean energy is increasingly seen as both an environmental imperative and an economic opportunity, as the legal framework is now more encouraging of clean energy investment and innovation.

5.1 Regulatory Framework

The legal framework governing Australia's clean energy sector constitutes a relationship of federal and state laws, each of them playing a pivotal role in advancing the country's clean energy objectives. It is rather important to note that the Australian Constitution does not make any mention of the subject of energy, the environment, or climate change.[116] At the federal level, the Australian Renewable Energy Agency (ARENA) stands as a cornerstone institution, established under the Australian Renewable Energy Agency Act 2011. ARENA, acting as an autonomous statutory authority, is tasked to improve technological advancements in this field and to enhance the renewable energy power of the nation.[117] ARENA, which is a funding vehicle for clean energy research, development, and deployment, is operational in several clean energy sectors, including solar, wind, and energy storage projects.[118]

Other relevant federal laws are the National Electricity Law (NEL) and the National Gas Law (NGL). These laws serve as a major bedrock for regulating energy markets, transmission, distribution, and retail activities. While the NEL deals with electricity markets,[119] NGL is the one for the natural gas

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[114] Renewable Electricity in Australia: Outcomes and Prospects (October 2011) https://www.climatechangeauthority.gov.au/sites/default/files/2020-06/SUB-RET-2012-87.pdf accessed 16 May 2024.

[115] Energy Transition towards Net Zero (IEA, 2023) Executive Summary https://www.iea.org/reports/australia-2023/executive-summary accessed 16 May 2024.

[116] A. Kallies, 'The Australian Energy Transition as a Federalism Challenge: (Un)cooperative Energy Federalism?' (2021) 10(2) Transnational Environmental Law 211-235 https://doi.org/10.1017/S204710252000045X. accessed 17 May 2024.

[117] Australian Renewable Energy Agency (ARENA), https://arena.gov.au/ accessed 17 May 2024.

[118] Ibid.

[119] To establish a unified national framework for a traditionally state-regulated sector, "mirror legislation" was adopted by all participating states and territories. The central legislation setting out National Electricity Market frameworks is the National Electricity Law (NEL). Under the NEL, detailed regulatory frameworks

markets,[120] which covers transportation and distribution networks. Together, these laws provide the minimum requirements for energy market operations, grid management, and interconnection, ensuring the efficient functioning of Australia's energy infrastructure. In addition to federal statutes, the National Energy Retail Law (NERL) also regulates the energy retail markets all over Australia.[121] Although not explicitly a federal law, it operates uniformly across states and territories, thus providing protection to consumers through standardizing the practices of billing, pricing, and customer rights.[122] This uniformity promotes consistency and fairness in energy retail transactions, thus consumers have trust in the market.

Furthermore, Australia's renewable energy landscape is further shaped by the laws of various states and territories and their independent ambitious clean energy goals. One example is South Australia, which has a target of achieving 100% clean energy by 2030, has accompanied this by policies such as feed-in tariffs, grid enhancements, and investments in large-scale renewable energy projects.[123] Similarly, Victoria State aims to reach 65% renewable energy by 2030, and this is supported by their state-led programs promoting solar installations and energy efficiency measures.[124]

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are established through delegated legislation known as the National Electricity Rules (NER). These rules predominantly govern the operational aspects of the National Electricity Market. Zsuzsanna Csereklyei and Anne Kallies, "A Legal-Economic Framework of Electricity Markets: Assessing Australia's Transition" (2022) MPRA Paper No. 114191, https://mpra.ub.uni-muenchen.de/114191/ accessed 17 May 2024.

120 Madeline E. Taylor, 'Is Gas Security in the 'National Interest'?: An Australian Eastern Gas Market Perspective' in Kim Talus (ed), Routledge Handbook of Energy Law (Routledge, 2020) 445-467.

121 National Energy Retail Law (South Australia) Act 2011, Schedule 1, is known as the National Energy Retail Law (NERL). Additionally, the National Energy Retail Law (ACT) Act 2012 applies the NERL in the Australian Capital Territory (ACT).

122 National Energy Retail Law (South Australia) Act 2011. See also Independent Competition and Regulatory Commission (ICRC) https://www.icrc.act.gov.au/utilities-licensing/national-energy-customer-framework accessed 17 May 2024.

123 Michael McGreevy and Fran Baum, 'South Australia has become a renewable energy powerhouse. How did they do it?' (Flinders University, 12 March 2021) https://climatechampions.unfccc.int/south-australia-has-become-a-renewable-energy-powerhouse-how-did-they-do-it/ accessed 17 May 2024.

124 Victoria State Government, 'Victorian Renewable Energy and Storage Targets' https://www.energy.vic.gov.au/renewable-energy/victorian-renewable-energy-and-storage-targets accessed 17 May 2024.

5.2. Policy Approaches by Australia for its Transition to Clean Energy

A clear sign of a strengthened national focus on the issue of transitioning to clean energy was the formation of the National Energy Transformation Partnership (NETP) in August 2022, by Australia's energy ministers, whose central role is to manage the challenges of the energy transition.[125] The Australian Energy Market Commission, the Australian Energy Market Operator, and the Australian Energy Regulator now use the emissions reduction objective of the NETP as a basis for new policies and regulations.[126] The federal government of Australia also passed the Climate Change Act in September 2022[127] with Australia being one of the few nations to have legislated its net zero targets.[128] Also, Australia announced its revised Nationally Determined Contribution (NDC) and made a commitment to achieving net zero emissions by 2050.[129] These federal initiatives can be taken to mean that both the federal, state, and territorial governments are united to align with the Paris Agreement, and there is an urgency to find solutions despite their historical reliance on coal generation and the presence of significant mining and agriculture sectors.[130]

5.3. Experiences in Australia toward Clean Energy

As mentioned earlier, the Australian government at all levels, works together to promote clean energy initiatives through several strategic partnerships and

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125 This NETP goal is to achieve net zero emissions by 2050. see Energy and Climate Change Ministerial Council, 'National Energy Transformation Partnership' (12 August 2022) https://www.energy.gov.au/energy-and-climate-change-ministerial-council/national-energy-transformation-partnership#:~:text=The%20National%20Energy%20Transformation%20Partnership%20%28the%20Partnership%29%20is,energy%20system%20to%20achieve%20net%20zero%20by%202050 accessed 17 May 2024.

126 Alvaro Leandro, Achieving the Transition to Net Zero in Australia (OECD Economics Department Working Papers No. 1794, ECO/WKP(2024) 6) https://www.oecd-ilibrary.org/docserver/9a56c9d2-en.pdf?expires=1718721276&id=id&accname=guest&checksum=67ACAADD4099DE99E325DCF400ED6B12 accessed 13 June 2024

127 Climate Change Act 2022 (Cth)

128 Australian Government Climate Change Commitments, Policies, and Programs: A Guide for AGS Investors (February 2024) https://www.aofm.gov.au/sites/default/files/2024-02-02/Climate%20change%20slides%20updated%20February%202024.pdf. Accessed 17 May 2024.

129 Ibid

130 Alvaro Leandro (n 126)

collaborative frameworks such as the NETP.[131] All governmental levels are working together to drive reforms aimed at transitioning the nation's energy system towards achieving net zero emissions by 2050.[132] This partnership underscores a shared vision among the stakeholders within their federalist structure. Furthermore, the federal government and multiple states, including Victoria, Tasmania, New South Wales, and Western Australia, have demonstrated a great deal of collaboration through the Rewiring the Nation Support initiative.[133] The goal of this initiative is to provide concessional finance and to speed up the implementation of transmission line projects, offshore wind farms, and clean energy zones.[134] This partnership helps to ensure the efficient and effective transition towards clean energy sources by improving grid integration capabilities and streamlining the deployment of clean energy infrastructure.

6. LESSONS FROM UNITED STATES OF AMERICA AND AUSTRALIA'S CLEAN ENERGY TRANSITION

While the Electricity Act of 2023 has been a much-welcomed development, Nigeria's energy sector remains at a crossroads and needs to show more practical steps to transition to clean and sustainable energy sources. This challenge is complicated by Nigeria's persistent over-reliance on fossil fuels, which still account for around 86% of its total export revenue. The country's massive oil exploration and production is contributing significantly to the rise in carbon dioxide emissions at an alarming rate.[135] Additionally, persistent power outages have led to the widespread use of fossil fuel-powered generators, further increasing greenhouse gas emissions.[136]

Moreover, it must be said that there is also a general lack of political will, driven by entrenched interests in the fossil fuel industry, economic dependencies on oil revenues, and insufficient investment in renewable

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131 Energy and Climate Change Ministerial Council, 'National Energy Transformation Partnership' (n 113)

132 Ibid.

133 Australian Government Department of Climate Change, Energy, Environment and Water, 'Rewiring the Nation supports its first two transmission projects' (October 2022) https://www.energy.gov.au/news-media/news/rewiring-nation-supports-its-first-two-transmission-projects accessed 18 May 2024.

134 Ibid.

135 Olujobi OJ (n 18) 15

136 Ibid.

energy infrastructure, which has hindered progress.[137] The lack of interest from political leaders in Nigeria to prioritize clean energy initiatives impedes the effective implementation of these legislative gains. Consequently, the slow pace of legislative implementation obstructs Nigeria's progress toward a sustainable energy future.

Furthermore, the obstacles confronting Nigeria's energy industry are made worse by the noticeable absence of proactive initiatives from state governments coupled with the lack of a workable cooperative strategy amongst the federal and state governments, underscoring the critical need for coordinated and committed all-encompassing plans to guarantee a quick and efficient transition to clean energy.[138] Examining the experiences of a federal nation like the United States and Australia is beneficial for Nigeria and other federal nations facing similar transition problems. The United States and Australia offer valuable insights due to their diverse energy landscapes, varied policy approaches, and the challenges faced in transitioning to cleaner energy sources.

Despite the giant strides that have been made by U.S and Australia, they have also encountered challenges with differing subnational energy policies. In the U.S., states like California spearhead clean energy initiatives, while others like Wyoming depend on fossil fuels, obstructing policy alignment in energy transition.[139] Australia faces similar issues, with regional economic disparities and tensions over energy policies.[140] Nonetheless, they have also shown that federal systems can foster clean energy transition through policy flexibility and innovation, exemplified by the autonomy granted to states allowing for localized experimentation with clean energy policies, as seen with California's pioneering initiatives allowing electric vehicles and energy efficient buildings to be made faster.[141] Collaborative regional efforts, such as Australia's

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137 A Nwozor, S Oshewolo, G Owoeye, and O Okidu, 'Nigeria's Quest for Alternative Clean Energy Development: A Cobweb of Opportunities, Pitfalls and Multiple Dilemmas' (2021) 149 Energy Policy 112070

138 Ibid.

139 MS Henry, "Transition Obstructionism and 'Embodied Energy Injustice:' A Wyoming Case Study" (2024) Contemporary Social Science 1-18.

140 S Carley and DM Konisky, 'The justice and equity implications of the clean energy transition' (2020) 5(8) Nature Energy 569-577.

141 A Balthasar, M A Schreurs and F Varone, 'Energy Transition in Europe and the United States: Policy Entrepreneurs and Veto Players in Federalist Systems' (2020) 29(1) The Journal of Environment & Development 3.

NETP[142] and the U.S. Regional Greenhouse Gas Initiative,[143] also demonstrate effective cooperation. Nigeria can thus learn valuable lessons, from the clean energy transition experience of Australia and the US. Some of these lessons include:

6.1 Developing Tailored Policies

The United States and Australia have adopted context-specific approaches to developing clean energy policies, unique to their federal structures. In Australia, states enjoy significant autonomy in setting energy policies and targets.[144] This approach allows subnational governments to tailor their strategies to local conditions and priorities. Similarly, with the gains of the Electricity Act 2023, leading to the decentralization of regulatory authority to empower Nigerian states, there is now room to develop and implement clean energy policies within the states. This approach would foster innovation, flexibility, and local ownership, driving progress toward national clean energy goals in Nigeria. A practical model would be the implementation of feed-in tariffs (FITs). FITs have been successfully adopted in various states in Australia to incentivize the adoption of renewable energy technologies, such as solar photovoltaic (PV) systems.[145] By introducing FITs at the state level, Nigeria can encourage investment in a local level clean energy generation and hence promote the widespread adoption of clean energy technologies across different regions.

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[142] National Energy Transformation Partnership (August 2022) https://www.energy.gov.au/energy-and-climate-change-ministerial-council/national-energy-transformation-partnershi. Accessed 4 June 2024.

[143] The RGGI is a cooperative effort among several U.S. states to cap and reduce carbon dioxide (CO_2) emissions from the power sector. Yan, J. 'The impact of climate policy on fossil fuel consumption: Evidence from the Regional Greenhouse Gas Initiative (RGGI)' (2021) Energy economics 105333. 100.

[144] Some states in Australia have ambitious targets. For example, Western Australia aims to deliver 80% renewable generation by 2035. Rhiannon Shine, 'What hope does Australia have at reaching net zero without WA dramatically upping its game?' (ABC News, 25 May 2024) https://www.abc.net.au/news/2024-05-25/can-australia-reach-net-zero-climate-targets-explainer/103879150 accessed 28 May 2024

[145] Parliament of Australia, 'Overview of Feed in Tariffs: a quick guide April 2014' (April 2014) https://www.aph.gov.au/About_Parliament/Parliamentary_Departments/Parliamentary_Library/pubs/rp/rp1314/QG/Tariffs accessed 28 May 2024

6.2 Enacting Specific Legislation on Clean Energy

The primary justification for enacting a separate clean energy law in Nigeria is that the Electricity Act 2023 is more concentrated on the regulation of non-renewable energies. Ukponu and others explained that it could be cumbersome for a single law to concurrently regulate both clean and not clean energy sources in detail.[146] Without distinct clean energy legislation, regulatory risks and uncertainties can deter investment, as seen in Australia's wind energy sector.[147] Hence, a separate clean energy law may be necessary to address this regulatory imbalance, harmonize different clean energy objectives and goals, and incorporate appropriate incentives to promote clean energy investments.[148]

Australia provides a compelling example, having enacted separate clean energy laws and achieved a significant integration of clean energy into its energy mix. Through a substantial investment, Australia surpassed its policy goal of 23.5% clean energy integration by 2020, reaching 24%.[149] This success is largely due to the government's Renewable Energy Target (RET) supported by Australia's clean energy law.[150] Enacting a separate clean energy law in Nigeria would ensure regulatory certainty, attract investor confidence, and mandate government focus on clean energy development. It would also allow the government to adopt and carry out extensive fiscal mechanisms for clean energy development within a dedicated legal framework, distinct from the Electricity Act of 2023.

6.3. Strong Political Will and Commitment to Drive Clean Energy Transition

Aliyu and others submit that the lack of transparency and credibility by Nigerian government officials have made many potential investors doubtful of her commitment to the energy sector reform.[151] However, with the benefits of the Electricity Act of 2023, emphasis should now be on a clear and practical government commitment to drive clean energy development. Nigeria can learn from the strong political will both Australia and the United States have demonstrated in driving their clean energy transitions from fossil

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146 Ukponu (n 47) 155

147 Ibid.

148 Ibid.

149 Ibid

150 Renewable Energy (Electricity) Act Australia.

151 I Aliyu, MK Sani, AA Muhammed and A Yakara, 'An Assessment of the Power Sector Reform in Nigeria' (2013) 2(2) International Journal of Advancement in Research and Technology 1

fuels. In Australia, the federal and state governments work closely to advance renewable energy initiatives through structured frameworks like the National Energy Transformation Partnership,[152] which ensures the alignment of goals and resources, facilitating significant investments in renewable energy infrastructure, such as the Rewiring the Nation initiative.[153]

Similarly, the United States demonstrates strong political will through comprehensive federal policies and state level initiatives that promote clean energy.[154] States like California and Texas showcase good examples with ambitious Renewable Portfolio Standards and substantial investments in solar and wind energy projects. California's intention to utilize exclusively only clean energy by 2045 and the fact that Texas is home to a significant portion of the country's wind energy underscores how political commitment at both federal and state levels can accelerate the transition to renewable energy. Nigeria can adopt similar multi-level governance and strong policy frameworks to enhance its clean energy initiatives, fostering collaboration between federal and state governments and ensuring a consistent, long-term vision for sustainable energy development to begin its journey of energy transition from fossil fuels to clean energy.

6.4 Cooperative Federalism

Nigeria can gain valuable knowledge from Australia and the US cooperative federalism model about transitioning from fossil fuels to clean energy.[155] In the United States, Congress makes environmental laws that preserve the primary role of states in achieving environmental quality goals while states are responsible for the administration, implementation, and ensuring

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[152] International Energy Agency, 'Australia 2023 Executive Summary' https://www.iea.org/reports/australia-2023/executive-summary accessed 24 May 2024.

[153] Department of Climate Change, Energy, the Environment and Water, 'Rewiring the Nation' https://www.dcceew.gov.au/energy/renewable/rewiring-the-nation accessed 24 May 2024.

[154] Federal acts like the Energy Policy Act of 2005 (EPAct) and the Energy Independence and Security Act of 2007 (EISA) provide a legislative foundation for clean energy transition. Programs under the Department of Energy (DOE), including the Advanced Research Projects Agency-Energy (ARPA-E) and the Office of Energy Efficiency and Renewable Energy (EERE), drive innovation and research in clean energy technologies.

[155] A Barichella, 'Climate Politics Under Biden: The Clean Energy Revolution, Enhanced Cooperative Federalism and the "All-of-Government" Approach' in Can Cities, States and Regions Save Our Planet? Transatlantic Perspectives on Multilevel Climate Governance (Springer International Publishing 2023) 85-128.

compliance with these national standards.[156] In Australia, mirror legislation passed by participating states, under the oversight of both state and federal executive governments, plays a crucial role in shaping energy policy and regulation.[157] This collaborative framework ensures a unified approach to energy market operations and regulatory consistency across the country.

According to the learned scholar, Professor Hepburn, federal and state governments must work together to develop and carry out effective energy policies.[158] Through this approach, Australia has successfully adopted clean energy technologies. In Nigeria, if the cooperative federalism model is adopted they would be able to leverage the strengths of both the federal government and individual states. This can facilitate the sharing of resources, knowledge, and best practices, enabling Nigeria to accelerate its clean energy initiatives.

6.5 Policy Consistency and Long-Term Vision

To provide investors, businesses, and stakeholders in the clean energy sector with direction and certainty, it is essential to set clear, long-term goals and targets. According to Idowu and others, the Federal Government of the nation is primarily responsible for the attainment of the sector's goals.[159] Australia's National Energy Transformation Partnership is a notable example of effective policy coordination,[160] as the NETP facilitates dialogue,

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156 United States Senate Committee on Environment & Public Works, Minority Report: Neglecting a Cornerstone Principle of the Clean Air Act: President Obama's EPA Leaves States Behind (31 October 2013) https://www.epw.senate.gov/public/_cache/files/6/c/6ceef5b2-07ef-4f68-8938-d947f409019d/01AFD79733D77F24A71FEF9DAFCCB056.103113finalepwminorityreportcooperativefederalism0.pdf accessed 25 May 2024.

157 Kallies, (n 106)

158 Samantha Hepburn, 'Cooperative federalism – a key step towards renewable energy in Australia. The importance of a nation-wide cooperative approach to renewable energy was the topic of Professor Samantha Hepburn's presentation at the Japan-Australia Dialogue on Energy Policy and Regulation held in Tokyo' (Deakin Law Newsroom, 5 October 2017) https://lawnewsroom.deakin.edu.au/news/2017/10/cooperative-federalism-a-key-step-towards-renewable-energy-in-australia/ accessed 25 May 2024

159 S Idowu, J Ibietan, and A Olukotun, 'Nigeria's Electricity Power Sector Reform: An Appraisal of Unresolved Issues' (2019) 9(6) International Journal of Energy Economics and Policy 336 http://econjournals.com/index.php/ijeep /article/ download/8232/4665 doi:10.32479/ijeep.8232 accessed 25 May 2024

160 National Energy Transformation Partnership (Department of Climate Change, Energy, the Environment and Water, August 2022) https://www.energy.gov.au

coordination, and joint action on clean energy priorities, among the major stakeholders.[161]

In the United States, President Biden's commitment to achieving a net-zero grid by 2035 exemplifies such ambition. This target signals a strong commitment to decarbonizing the electricity sector and aligns the country's energy policies with global climate goals.[162] Nigeria can similarly benefit from establishing ambitious carbon-neutral targets, which would not only demonstrate its dedication to combating climate change but also attract international investment and support for clean energy projects.

Although Nigeria has made significant strides toward energy transition through the Nigeria Energy Transition Plan (ETP), which provides a home-grown, data-backed strategy for achieving net-zero emissions by 2060, there is a need for a more collaborative approach.[163] Involving major stakeholders, especially federal and state governments, can facilitate joint action on clean energy transition. To ensure the success of these policies, Nigeria must integrate international best practices and commitments into its energy strategy. Aligning Nigeria's climate goals with those of leading nations can enhance the credibility and appeal of its energy transition efforts.

6.6 Tax Incentives

Nigeria can use tax incentives to accelerate the growth of clean energy by learning from the experiences of the United States. The US provided tax incentives, such as the Investment Tax Credit and the Production Tax Credit for clean energy projects.[164] These reduced the financial risks involved and

/energy-and-climate-change-ministerial-council/national-energy-transformation-partnership accessed 25 May 2024

161 Ibid.

162 White House, 'Fact Sheet: President Biden to Catalyze Global Climate Action through the Major Economies Forum on Energy and Climate' (April 2023) https://www.whitehouse.gov/briefing-room/statements-releases/2023/04/20/fact-sheet-president-biden-to-catalyze-global-climate-action-through-the-major-economies-forum-on-energy-and-climate/ accessed 25 May 2024

163 Chigozie Nweke-Eze, Just Energy Transitions and Partnerships in Africa: A Nigeria Case Study (Integrated Africa Power (IAP), October 2022) https://www.iddri.org/sites/default/files/PDF/Publications/Catalogue%20Iddri/Rapport/Ukama_NIG_v05.pdf accessed 25 May 2024

164 G Gutenkauf, Renewable Energy Development by Electric Cooperatives: Indirect Uses of Federal Energy Tax Credits (2022) University Digital Conservancy https://hdl.handle.net/11299/252424 accessed 4 June 2024

attracted significant investment to clean energy projects.[165] Nigeria can adopt this approach by developing similar tax incentives to encourage investments in renewable energy technologies like solar, wind, and hydroelectric power. Nigeria can thus develop a strong, economically viable clean energy sector with the right fiscal incentives. Additionally, to enhance and facilitate the continued expansion of the clean energy sector, it is crucial to boost the investor's confidence with the assurance that these incentives would remain stable and predictable over time.

6.7 Research Funding and Innovation Initiatives

The U.S. Department of Energy's Advanced Research Projects Agency-Energy (ARPA-E) and the Office of Energy Efficiency and Renewable Energy (EERE) have played a crucial role in the clean energy sector through research funding and innovation initiatives.[166] Nigeria could also establish an agency focused solely on promoting research and innovative ideas in clean energy. One way that Nigeria can benefit from establishing this agency is by establishing one exclusively focused on rural energy projects like ARPA-E, which gives funds to innovative clean energy projects and helps fix related technical problems.

7. CONCLUSION AND RECOMMENDATIONS

For federal countries like Nigeria, the transition to clean energy is a critical necessity given the urgent need to reduce global warming. Through comparative experiences from the United States and Australia, Nigeria, and other federal nations can navigate its clean energy transition more effectively. These countries have shown the importance of tailored policies, and the establishment of clear, long-term goals. Most importantly, they have shown practical commitment to them. By putting these lessons to use, Nigeria and

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[165] Evergreen Action, 'What Are Clean Energy Tax Credits and How Do They Work?' (May 2023) https://www.evergreenaction.com/blog/what-are-clean-energy-tax-credits accessed 25 May 2024

[166] The U.S. Department of Energy (DOE) also announced $20 million to develop cost-effective, highly accurate hydrogen detection and quantification technologies. This investment is essential for advancing clean energy solutions, including electric vehicles and hydrogen-based systems. US Department of Energy, 'Notice of Intent: Fiscal Year 2024 Batteries & Electrification Funding Opportunity' https://www.energy.gov/eere/vehicles/notice-intent-fiscal-year-2024-batteries-electrification-funding-opportunity accessed 25 May 2024 See also, Advanced Research Projects Agency-Energy (ARPA-E) https://arpa-e.energy.gov/ accessed 4 June 2024

other federal nations facing transition challenges can harness their clean energy resources, enhance the efficiency and reliability of their energy sector, and ease their transition to clean energy.

For federal governments to transition to clean energy, they need a unified and effective strategy. What can such countries do? Here are some recommendations:

1. Decentralize Policy Frameworks: This strategy is exemplified by Western Australia and California which are at the forefront of promoting clean energy initiatives. It allows local authorities to make laws based on their unique situation.
2. Create comprehensive National Plans: Developing national energy plans for transitioning to clean energy such as the ARENA (Australian Renewable Energy Agency), National Electricity Law, and the National Gas Law in Australia together with having clear, long-term goals can provide a solid foundation for clean energy transition.
3. Develop platforms for Collaboration: Creating platforms for cooperation between different levels of government (federal and state governments), private sector leaders, and civil society groups can be extremely beneficial. This platform will help the sharing of knowledge, exchange of resources, expertise, and best practices, towards achieving clean energy objectives. In a more coordinated manner.
4. Set ambitious Carbon Targets: Aggressive, clearly defined goal setting by the federal government for carbon neutrality like Australia's greenhouse gas emissions reduction targets is necessary. These goals should also be in line with international obligations on climate change like that of Australia's Nationally Determined Contribution in alignment with the United Nations Framework Convention on Climate Change.
5. Tax Incentives: Government should provide tax credits for clean energy investments. By taking inspiration from successful policies such as the Investment Tax Credit and Production Tax Credit in the U.S. can provide a good model for other federal nations.
6. Funding Research and Innovation: it is possible that new technologies can be driven and efficiency created through the establishment of agencies that will focus on energy research and innovation, similar to the U.S. Advanced Research Projects Agency-Energy.

By implementing these recommendations, federal nations can create a conducive environment for clean energy development, foster economic resilience, and ultimately play a significant role in the global effort to fight climate change.