KASU Journal of Economics and Development Studies (KASUJEDS)
Vol 12, Issue 1, No 1, June 2025. ISSN: 2805-3303 (Print)

GOVERNANCE FOR SUSTAINABLE OFF-GRID ELECTRIFICATION: A TRANSITION MANAGEMENT PERSPECTIVE FROM NIGERIA

Ahmed Ibrahim Butu
Department of Business Administration,
Yobe State University, Damaturu
Email: butuahmed@ysu.edu.ng

Abstract

Most energy-transition research overlooks how governance shapes community renewable energy initiatives in rural developing contexts. This study applies Transition Management (TM) to examine governance arrangements for off-grid electrification in Nigeria. Using a qualitative case study approach, data were collected through 24 semi-structured interviews with regulators, ministries, agencies, community actors, and researchers, as well as documentary evidence. Thematic analysis mapped empirical patterns to core TM dimensions, including transition arena composition, visioning and pathway development, coordination, market support, and business models. Findings reveal that the transition arena is dominated by federal actors, with limited involvement of communities, NGOs, private developers, and sub-national governments. Additionally, unclear institutional mandates and inconsistently implemented incentives erode legitimacy, community ownership, and investor confidence. The study proposes a governance roadmap featuring broadened participation, clearer role definitions, time-consistent incentive frameworks, and cooperative ownership models. The paper contributes to energy transition scholarship by adapting TM to a rural African context and providing actionable policy mechanisms for accelerating community-scale renewable transition.

Keywords: Transition Management (TM); Energy governance; Rural electrification; Off-grid renewable energy; Community participation

1. Introduction

Access to clean, affordable, and reliable energy plays a vital role in achieving the Sustainable Development Goals (SDGs) (Santika et al., 2019; Elum and Mjimba, 2020). However, a significant proportion of Nigeria's population still lacks access to basic electricity services, particularly those living in rural off-grid areas where households rely on traditional biomass and other environmentally harmful energy sources (IEA, 2021; Ayamolowo et al., 2019; Babatunde et al., 2019).

To address these challenges, the Nigerian government introduced market-oriented reforms through the Electric Power Sector Reform (EPSR) Act of 2005, which unbundled the electricity sector and created the Nigerian Electricity Regulatory Commission (NERC) as the sector regulator. The Rural Electrification Agency (REA) was also established to support electrification in underserved rural areas. In 2013, the privatisation of generation and distribution assets transferred significant operational

responsibilities to private investors. However, these reforms were primarily oriented toward the national grid and urban service delivery, resulting in rural communities continuing to face limited electrification opportunities (Madu, 2016; Sreekumar, 2008).

To address rural energy needs, further policies were introduced to encourage decentralised, community-scale renewable energy systems (Yakubu et al., 2018; Emodi and Ebele, 2016). Notably, the NERC Mini-Grid Regulation (2016) provided tariff guidelines, technical standards, and grid-arrival compensation mechanisms designed to reduce developer risk and encourage private-sector-led mini-grid deployment. More recently, the Electricity Act (2023) devolved authority to state governments to create and regulate sub-national electricity markets, signaling a shift toward multi-level governance in electrification planning (FGN, 2023).

Despite these policy advances, an enabling environment capable of attracting sustained private investment, ensuring coherent inter-agency coordination, and fostering meaningful community participation has yet to be achieved. This is consistent with research showing that transitions in socio-technical systems—such as the energy sector—are complex and require deliberate, long-term governance strategies due to the interdependence of technologies, institutions, markets, and user practices (Geels, 2011, 2020; Verbong and Geels, 2010).

Transition Management literature suggests that such transitions can be steered more effectively when actors collaboratively develop shared visions, negotiate roles and expectations, and coordinate learning across multiple scales (Loorbach and Rotmans, 2006; Lockwood, 2013). However, as this study demonstrates, the lack of inclusive stakeholder participation, weak coordination frameworks, and inconsistently implemented incentive mechanisms continue to hinder progress toward rural energy transition in Nigeria.

This paper, therefore, examines governance approaches to planning and implementing community-scale renewable electrification in rural Nigeria, focusing on how actor participation, institutional alignment, and incentive structures shape the transition process.

2 Literature Review

This section reviews scholarly contributions relevant to energy access, rural electrification, community participation, and transition governance. It also explains the theoretical framework guiding the study—Transition Management (TM). The aim is to situate the research within existing academic debates and identify conceptual and empirical gaps addressed in this study

2.1 Energy access and rural electrification in Nigeria

Access to affordable and reliable electricity is central to socio-economic development and improved well-being (Santika et al., 2019). Yet, Nigeria continues to experience low electrification rates in rural areas, where most households rely on kerosene, firewood, and diesel generators with adverse social, environmental, and financial consequences (Babatunde et al., 2019; Butu and Strachan 2022).

The Electric Power Sector Reform (EPSR) Act (2005) initiated the restructuring of the national utility and established the Nigerian Electricity Regulatory Commission (NERC) and Rural Electrification Agency (REA). Further privatization of power generation and distribution in 2013 sought to improve

efficiency and investment (Joseph, 2014). However, these reforms largely emphasized central grid expansion, which has proven economically and logistically challenging in remote areas (Madu, 2016). As a result, off-grid renewable mini-grids have gained prominence as viable alternatives (Yakubu et al., 2018; Emodi and Ebele, 2016).

2.2 Community participation in rural electrification

Community participation is widely recognized as a critical factor in the sustainability of rural development and infrastructure projects (Utuk, 2014). Within rural electrification, participation extends beyond awareness campaigns to include involvement in planning, decision-making, implementation, and long-term management of energy systems (Adesida and Okunlola, 2015). Meaningful participation fosters a sense of ownership, strengthens project legitimacy, and enhances local capacity to support operation and maintenance activities (Fakere and Ayoola, 2018).

However, community involvement in practice often remains limited to informational or consultative engagement, where local actors are informed about project decisions but are not empowered to influence those decisions (Abdullahi et al., 2014). Such passive forms of participation may raise awareness but do not translate into ownership, which is necessary for sustained collective responsibility and system continuity.

In contrast, studies from other countries demonstrate that collaborative or ownership-based involvement leads to more resilient outcomes. For instance, community-owned and co-owned renewable energy initiatives in Germany and Switzerland show higher levels of acceptance, better tariff compliance, and longer-term maintenance commitment (Li et al., 2013; Kaphengst and Velten, 2014; Richter, 2013). These models allow community members to participate in governance structures and hold equity stakes, reinforcing local empowerment and accountability.

In the Nigerian context, while community structures such as cooperative societies exist, their roles in rural electrification projects are often restricted to supportive functions such as fee collection or providing labour, rather than decision-making or shared ownership (Fakere and Ayoola, 2018). The institutional and policy frameworks needed to support community equity participation — such as financing schemes, legal protections, and governance training — are underdeveloped (Emodi and Ebele, 2016; Butu and Strachan 2022).

2.3 Governance challenges in rural energy transition

Governance plays a central role in shaping the direction, pace, and sustainability of energy transitions, particularly in settings where institutional capacity and policy coherence are still evolving (Geels, 2011; Verbong and Geels, 2010). In Nigeria, the governance of rural electrification is characterized by multi-layered institutional arrangements, where federal agencies, state authorities, private actors, donor organizations, and local communities interact in complex and sometimes fragmented ways. While this structure provides opportunities for collaboration, it also creates challenges related to role clarity, coordination, accountability, and resource allocation (Ohiare, 2015; Butu and Strachan 2022).

One of the most persistent challenges is the overlap of institutional mandates. The Federal Ministry of Power, the Rural Electrification Agency (REA), and the Nigerian Electricity Regulatory Commission

(NERC) each play critical roles in electrification policy, funding, and regulatory oversight. However, respondents and policy evaluations frequently point out that these roles are not clearly differentiated in practice, resulting in duplicated efforts, inconsistent program execution, and stalled initiatives (Butu and Strachan 2022; Madu, 2016). At the sub-national level, state and local governments are expected to mobilize local participation and support implementation, yet they are often insufficiently integrated into decision-making spaces at the federal level (Adesida and Okunlola, 2015).

A second key challenge relates to policy stability and implementation credibility. While Nigeria has introduced a number of supportive frameworks — such as the Mini-Grid Regulation (2016) and various renewable energy strategies — implementation has been inconsistent, with delays in fund disbursements, tariff approvals, and programm monitoring (Yakubu et al., 2018). This inconsistency weakens investor confidence, discourages private sector participation, and slows the scaling of mini-grid projects (Butu and Strachan 2022).

A third challenge concerns the absence of mechanisms for structured learning and adaptation. Transition processes require iterative feedback loops in which pilot projects generate evidence that informs refinement of strategies and regulations (Loorbach, 2007). However, in Nigeria, lessons from rural electrification pilots are not consistently documented or used to guide policy updates. As a result, valuable knowledge about technical performance, tariff acceptance, local governance, and long-term maintenance practices remains underutilized (Fakere and Ayoola, 2018).

Finally, limited community integration in governance further constrains transition outcomes. Without structured roles for communities in planning, management, or ownership, electrification projects risk being perceived as external interventions rather than shared local assets (Utuk, 2014). This weakens commitment to system maintenance and reduces sustainability in the long term.

In summary, governance challenges in rural electrification in Nigeria stem from institutional fragmentation, inconsistent implementation, weak learning mechanisms, and limited community integration. Addressing these challenges requires deliberate coordination across actors and the development of inclusive and adaptive governance frameworks.

2.4 Theoretical Perspective

Transition Management (TM) is utilised in this paper to provide the theoretical lens for understanding governance processes in rural energy transitions. TM distinguishes between natural transitions, which occur gradually through evolutionary processes, and guided transitions, which involve coordinated and purposive action among stakeholders to achieve long-term system change (Kemp and Rotmans, 2004). The latter form is most relevant to renewable energy deployment in rural Nigeria, where institutional actors and communities must engage in collective decision-making for successful implementation.

TM is appropriate because community-scale off-grid electrification involves multiple actors, multiple levels of authority, and long-term transitional phases, aligning with TM's core principles of shared visioning, inclusive governance, experimentation, and learning-based adaptation (Loorbach and van Raak, 2006).

2.4.1 Envisioning and pathway development

The TM process begins with convening a transition arena — a forum where diverse actors jointly define societal problems and co-develop future visions (Ferguson et al., 2012). This arena can emerge through government leadership or from pioneering actors within civil society (Smith and Stirling, 2008; Kemp et al., 2007). In the Nigerian context, the Ministry of Power (FMPower) has performed this convening function, particularly through the Inter-Ministerial Committee on Renewable Energy and Energy Efficiency.

Once the arena is established, actors collaborate to develop a shared long-term vision and transition pathways (Rotmans et al., 2001). These pathways are not static plans but evolving strategic orientations that allow actors to coordinate policies, incentives, learning cycles, and resource distribution over time (Loorbach and Rotmans, 2010).

However, effective pathway development requires: actor awareness of the shared vision; clear communication mechanisms as well as alignment of roles, expectations, and milestones. The uncoordinated programs and unclear mandates — as seen in Nigeria — undermine pathway coherence (Mehlwana, 2004; Butu and Strachan 2022).

2.4.2 Stakeholder and community engagement

TM emphasises the inclusive participation of heterogeneous actors, including state regulators, private developers, civil society organisations, financiers, and local communities (Loorbach, 2007; Fischer and Newig, 2016). Community participation is especially critical in rural renewable energy, not only to foster legitimacy and social acceptance, but also to promote local ownership, maintenance culture, and capacity building (Quist et al., 2013; Raven, 2007). In many developing-country contexts, rural development projects historically proceed without meaningful community involvement (Abdullahi et al., 2014). This exclusion undermines the sustainability of interventions and increases the likelihood of project failure. TM, therefore, requires deliberate stakeholder balancing and inclusive arenas that evolve over time (Kemp and Loorbach, 2006).

2.5 Creating market supports

Community renewable energy systems must operate within existing political-economic environments that often privilege centralised and fossil-fuel-based energy systems (Smith and Raven, 2012). To enable emerging systems, TM calls for market support mechanisms, which may include:

- Financial incentives (e.g., grants, subsidies, concessionary loans)
- Regulatory protections (e.g., tariff guarantees, interconnection protections)
- Fiscal reforms (e.g., tax exemptions on mini-grid equipment)
- Institutional reforms (e.g., simplified licensing and permitting)

However, such incentives must be credible, consistent, and time-aligned to maintain investor confidence (Azuela and Barroso, 2012).

2.6 Developing business models

TM further emphasises the role of innovative business models that entrench community interests and financial sustainability (Chesbrough and Rosenbloom, 2002). Business models shape how value is created, shared, and reinvested in renewable energy systems (Bidmon and Knab, 2014). In rural electrification, cooperative ownership models can enhance community commitment and long-term system viability (Kaphengst and Velten, 2014; Richter, 2013).

Yet in Nigeria, cooperatives often function only as fee collection agents rather than equity partners. This reveals a governance gap in enabling community co-ownership, legal frameworks, and capacity-building for local actors.

3. Methodology

This study adopts an interpretivist qualitative research paradigm, based on the understanding that social phenomena are shaped by the meanings that individuals and groups assign to them (Creswell, 2013). The interpretivist orientation is appropriate because governance processes, stakeholder engagement, and perceptions of legitimacy are context-dependent and cannot be fully captured using purely quantitative approaches. In line with interpretivist research perspective, a case study design is utilised because it is suitable for understanding complex social systems situated within real-life contexts (Yin, 2009). The case in this study is the governance of off-grid electrification initiatives directed toward rural communities in Nigeria.

3.1 Data collection

Primary data for this study were collected through semi-structured interviews, which are appropriate for exploring participant perspectives while allowing flexibility to probe emerging issues (Guest et al. 2012). An initial group of key informants was selected using purposive sampling, based on their involvement in rural electrification policy, regulation, implementation, or community-level energy initiatives. This group included officials from the Federal Ministry of Power (FMPower), the Nigerian Electricity Regulatory Commission (NERC), the Rural Electrification Agency (REA), selected state and local government representatives, renewable energy developers, community members, and academic researchers.

Following initial interviews, snowball sampling was used to identify additional participants with relevant knowledge and experience. In total, 24 interviews were conducted. Each interview lasted between 60 and 90 minutes and followed a flexible interview guide that covered themes such as stakeholder involvement, policy design and coordination, community participation, and business and financing arrangements.

Data collection continued until thematic saturation was reached, meaning that no substantially new insights, themes, or perspectives were emerging from additional interviews. Saturation was identified when successive interviews began to replicate previously coded patterns, indicating that key dimensions of the governance processes under investigation had been sufficiently captured.

All interviews were conducted in English and took place either in person or via telephone/video call, depending on participant availability. Audio recordings were transcribed verbatim and prepared for coding and analysis.

3.2 Data handling and analysis

All interviews were audio-recorded with participant consent and subsequently transcribed verbatim. The transcripts were anonymised and assigned alphanumeric codes to protect the identities of respondents. The data were then imported into NVivo software to support systematic organisation and analysis. A thematic analysis approach was adopted to identify key patterns across the data. The analysis followed the stages outlined by Braun and Clarke (2006), beginning with familiarisation through repeated reading of transcripts, followed by the development of initial codes that captured meaningful features of the data. These codes were then grouped into broader categories, from which overarching themes were refined, reviewed, and interpreted in relation to the research questions.

During analysis, both manifest content (explicit meanings expressed by participants) and latent content (underlying assumptions and interpretations) were considered to ensure depth of understanding. Documentary sources, including policy documents, regulatory frameworks, and programme reports, were used to triangulate interview findings and strengthen the credibility of interpretations. Reflexive field notes were maintained throughout the process to enhance analytical rigour and reduce researcher bias.

3.3 Ethical consideration

Participants were informed of the research objectives and provided informed consent. To maintain confidentiality, respondents were assigned anonymous alphanumeric identifiers (e.g., Regulator01, Community03, or Developer02). Institutional affiliations are referenced generically rather than by name to avoid traceability.

4. Results and Discussion

This section presents and interprets the findings of the study. The results are organised according to key elements of Transition Management (TM), linking empirical evidence to theoretical expectations. Verbatim quotations illustrate respondent perspectives and support thematic insights.

4.1 Formation of the transition arena

Respondents acknowledged the creation of the Inter-Ministerial Committee on Renewable Energy and Energy Efficiency (ICREEE) as a significant step in convening actors around the rural electrification agenda (Kemp et al., 2007; Loorbach and Rotmans, 2006). As one regulator explained:

"...the inter-ministerial committee is the platform that brings the entire group of stakeholders to deliberate on such issues." (Regulator01)

The committee provides a forum for strategic discussion and aligns with TM's concept of a transition arena, where actors negotiate goals and priorities collaboratively (Loorbach, 2007). However, respondents reported that membership remains heavily skewed toward federal ministries and agencies, with minimal representation of local governments, civil society groups, private developers, or

community stakeholders. A transition arena lacking diverse representation restricts the circulation of ideas, limits perspectives, reduces legitimacy, and weakens shared problem ownership (Fischer and Newig, 2016). TM emphasises the inclusion of heterogeneous actors to foster meaningful learning and coordination. The current structure, therefore, slows the overall transition trajectory.

4.2 Visioning and pathway alignment

Respondents agreed on the broader national goal of expanding access to clean energy, noting the government's endorsement of the Sustainable Energy for All (SEforALL) initiative. One participant stated:

"*...the federal government has endorsed the Sustainable Energy for All initiative by 2030. The government is working toward realising this ambition."* (Regulator01)

At the same time, interviewees highlighted that awareness and internalisation of the vision remain uneven across agencies and sub-national actors. While participants acknowledged that off-grid renewable energy is the most feasible approach to rural electrification, fragmented implementation persists (Yakubu et al., 2018; Ohiare, 2015). Similarly, the absence of a coherent, Nigeria-specific rural electrification pathway weakens strategic coordination and slows implementation. TM posits that effective transitions require a shared long-term vision guiding coordinated action (Rotmans et al., 2001). The findings therefore reveal a vision–practice gap: while national goals are articulated, operational alignment remains weak, resulting in duplicated efforts and reduced policy coherence (Geels, 2011; Verbong and Geels, 2010).

4.3 Stakeholder and community participation

The composition of ICREEE and associated planning structures is dominated by policymakers and regulatory institutions. Respondents consistently reported limited opportunities for community engagement in planning or decision-making processes (Adesida and Okunlola, 2015; Utuk, 2014). As one community representative stated:

"*They [communities] were not given any specific room for participation... there is no specific role given to them in the planning or decision making*." (Community01)

Similarly, state and local governments, which are closest to the communities affected, were perceived as peripheral actors in the planning structure:

"*...this should be done not only by the [central] government; the state and local governments must also be involved because the communities are under the state and local government*." (Regulator01)

TM highlights the importance of collective participation and local engagement in transition processes (Raven, 2007; Fischer and Newig, 2016). Limited participation reduces local ownership, system acceptance, and long-term sustainability. International evidence shows that cooperative equity participation improves accountability and performance (Kaphengst and Velten, 2014; Richter, 2013). The Nigerian context reveals a missed opportunity to drive in inclusive governance and shared ownership.

4.4 Business model development and community ownership

Respondents highlighted that prevailing business arrangements do not currently support community co-ownership of mini-grid systems. Instead, local cooperatives typically function in supportive roles such as fee collection and basic maintenance. One rural electrification officer observed:

"*...it will be a good idea if the cooperative societies will participate in the ownership but as at now I don't think it is possible..."* (RuralAgency03)

The challenges to developing viable community ownership models include low income levels limiting equity contribution, insufficient awareness of ownership possibilities, and the absence of supportive legal and financial mechanisms (Emodi and Ebele, 2016; Fakere and Ayoola, 2018). Current business models prioritise short-term service provision sustainability but fall short of fostering long-term governance sustainability through shared investment. TM argues that sustainable transitions depend on embedding innovative business models that distribute value and responsibility equitably (Chesbrough and Rosenbloom, 2002; Bidmon and Knab, 2014). Without co-ownership, systems risk weak community commitment and poor long-term upkeep.

4.5 Market support and incentives

Respondents recognised the importance of government and donor incentives in enabling renewable energy deployment (Azuela and Barroso, 2012). However, they noted that inconsistent funding flows, delayed disbursement, and shifting policy priorities undermine confidence and long-term planning (Yakubu et al., 2018; Butu and Strachan, 2022). As one participant explained:

"*You cannot tell somebody that you have allocated or budgeted money for rural electrification and then diverted that money for something else*." (RuralAgency03)

Although policy instruments such as feed-in tariffs and tax exemptions exist on paper, respondents reported unreliable implementation (NERC, 2016). TM underscores that credible and time-consistent market support mechanisms are essential for sustaining niche innovations and scaling them up (Smith and Raven, 2012). Inconsistent application of incentives fosters perceptions of high risk, discouraging private developers and weakening investor confidence.

Across these themes, the findings demonstrate that Nigeria's rural mini-grid transition is initiated but weakly institutionalised. The transition arena exists but lacks inclusivity; the national vision exists but lacks coherence; community structures exist but lack ownership authority; and incentive frameworks exist but lack credibility. Each constraint interacts to dampen transition momentum.

5. Conclusion and recommendations

This study examines the governance dynamics shaping community-scale renewable energy transitions in rural Nigeria using the Transition Management (TM) framework. The findings indicate that while formal structures for coordinating energy transition exist—such as the Inter-Ministerial Committee on Renewable Energy and Energy Efficiency—the transition arena remains limited in inclusiveness. Participation is dominated by federal actors, while state and local governments, private developers, civil society organisations, and community representatives are only marginally involved. This restricts shared learning, weakens legitimacy, and reduces collective ownership of transition efforts (Loorbach, 2007; Fischer and Newig, 2016).

Although the government has endorsed a broad clean energy vision through the Sustainable Energy for All (SEforALL) commitment, implementation remains fragmented, and there is no unified, Nigeria-specific rural off-grid electrification pathway. Mini-grid deployments are expanding, yet lessons from projects are not systematically captured or used for institutional learning (Yakubu et al., 2018; Ohiare, 2015). Moreover, current business models do not enable community co-ownership, and financial and regulatory incentives are inconsistently implemented, undermining investor confidence and slowing scale-up.

Accelerating community-scale off-grid electrification in rural Nigeria requires strengthening governance structures, improving coordination, and enabling meaningful local participation. The study recommends the following:

i. Broaden participation in the transition arena: Include state and local governments, civil society organisations, private developers, and democratically selected community representatives to promote legitimacy and inclusiveness.

ii. Clarify institutional roles and coordination frameworks: Establish clear mandates and collaborative mechanisms among key agencies, including the Ministry of Power, the Rural Electrification Agency, and NERC, to prevent overlap and fragmentation.

iii. Develop a unified national pathway for rural off-grid electrification: This should outline measurable objectives, aligned responsibilities, and coherent policy instruments across governance levels.

iv. Strengthen incentive mechanisms: Ensure predictability and credibility in fiscal and regulatory incentives such as grid-arrival compensation, tariff frameworks, and tax reliefs to build investor confidence.

v. Enable community co-ownership: Introduce cooperative equity frameworks, provide governance and financial literacy training, and support regulatory structures for local ownership models.

vi. Institutionalise learning and feedback: Create mechanisms for continuous knowledge sharing between pilot projects, policymakers, and regulators, integrating evidence into policy updates.

This comprehensive governance roadmap aligns with TM principles of inclusive arenas, credible market support, adaptive pathways, and reflexive learning. Implementing these recommendations is expected to strengthen legitimacy, enhance community empowerment, and accelerate Nigeria's transition toward sustainable, community-scale renewable electrification.

References

Abdullahi, M., Ahmed, A. and Sale, I. (2014) 'Community participation and project sustainability in rural Nigeria: A study of Bauchi State local empowerment and environmental management project', *African Journal of Sustainable Development*, 4(1), pp. 61–76.

Adesida, I.E. and Okunlola, J.O. (2015) 'Effects of community participation on the sustainability of rural infrastructure in Ondo State, Nigeria', *Asian Journal of Agricultural Extension, Economics & Sociology*, 7(1), pp. 1–10.

Azuela, G.E. and Barroso, L.A. (2012) *Design and performance of policy instruments to promote the development of renewable energy: Emerging experience in selected developing countries.* Washington, D.C.: World Bank.

Ayamolowo, O.J., Buraimoh, E., Salau, A.O. and Dada, J.O. (2019) 'Nigeria electricity power supply system: The past, present and the future', in *2019 IEEE PES/IAS PowerAfrica Conference.* Abuja: IEEE, pp. 64–69.

Babatunde, O.M., Adedoja, O.S., Babatunde, D.E. and Denwigwe, I.H. (2019) 'Off-grid hybrid renewable energy system for rural healthcare centres: A case study in Nigeria', *Energy Science & Engineering*, 7(3), pp. 676–693.

Bidmon, C.M. and Knab, S. (2014) 'The three roles of business models in socio-technical transitions', *Technology Analysis & Strategic Management*, 26(4), pp. 123–140.

Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, 3(2), 77–101.

Butu, A.I. and Strachan, P., 2022. Navigating pathways for community renewable electricity in rural areas: exploring stakeholders' perspectives on Shape community project. *International journal of sustainable energy planning and management,* 33, pp.19-34.

Chesbrough, H. and Rosenbloom, R.S. (2002) 'The role of the business model in capturing value from innovation', *Industrial and Corporate Change*, 11(3), pp. 529–555.

Creswell, J.W. (2013) *Qualitative inquiry and research design: Choosing among five approaches.* 3rd edn. Thousand Oaks: SAGE Publications.

Elum, Z.A. and Mjimba, V. (2020) 'Potential and challenges of renewable energy development in promoting a green economy in Nigeria', *Africa Review*, 12(2), pp. 172–191.

Emodi, N.V. and Ebele, N.E. (2016) 'Policies enhancing renewable energy development and implications for Nigeria', *Renewable and Sustainable Energy*, 4(1), pp. 7–16.

Fakere, A.A. and Ayoola, H.A. (2018) 'Socioeconomic characteristics and community participation in infrastructure provision in Akure, Nigeria', *Cogent Social Sciences*, 4(1), p. 1437013.

Ferguson, P., Brown, K. and Barr, S. (2012) 'The governance of sustainable energy transitions: A political ecology perspective', *Geoforum*, 43(5), pp. 955–966.

Fischer, L. and Newig, J. (2016) 'Importance of actors and agency in sustainability transitions: A systematic exploration', *Sustainability*, 8(5), p. 476.

FGN (2023) *Electricity Act 2023.* Abuja: Federal Government of Nigeria. Available at https://www.power.gov.ng/download/electricity-act-2023/

Geels, F.W. (2011) 'The multi-level perspective on sustainability transitions: Responses to seven criticisms', *Environmental Innovation and Societal Transitions*, 1(1), pp. 24–40.

Geels, F.W. (2020) 'Micro-foundations of the multi-level perspective', *Technological Forecasting and Social Change*, 152, p. 119894.

Guest, G., Namey, E.E. and Mitchell, M. (2012) *Collecting qualitative data: A field manual for applied research.* Thousand Oaks: SAGE Publications.

IEA (2021) *Africa Energy Outlook 2021.* Paris: International Energy Agency.

Joseph, I.O. (2014) 'Issues and challenges in the privatised power sector in Nigeria', *Journal of Sustainable Development Studies*, 6(1), pp. 161–174.

Kaphengst, T. and Velten, E.K. (2014) *Energy transition and behavioural change in rural areas: The role of energy cooperatives.* WWWforEurope Working Paper No. 60.

Kemp, R., Loorbach, D. and Rotmans, J. (2007) 'Transition management as a model for managing processes of co-evolution towards sustainable development', *International Journal of Sustainable Development & World Ecology*, 14(1), pp. 78–91.

Li, L.W., Birmele, J., Schaich, H. and Konold, W. (2013) 'Transitioning to community-owned renewable energy: Lessons from Germany', *Procedia Environmental Sciences*, 17, pp. 719–728.

Lockwood, M. (2013) 'The political sustainability of climate policy: The case of the UK Climate Change Act', *Global Environmental Change*, 23(5), pp. 1339–1348.

Loorbach, D. (2007) *Transition management: New mode of governance for sustainable development.* Rotterdam: Erasmus University.

Loorbach, D. and Rotmans, J. (2006) 'Managing transitions for sustainable development', in Olsthoorn, X. and Wieczorek, A.J. (eds.) *Understanding industrial transformation.* Dordrecht: Springer, pp. 187–206.

Loorbach, D. and Rotmans, J. (2010) 'The practice of transition management: Examples and lessons from four distinct cases', *Futures*, 42(3), pp. 237–246.

Loorbach, D. and van Raak, R. (2006) 'Strategic niche management and transition management: Different but complementary approaches', *Technological Forecasting and Social Change*, 73(5), pp. 600–614.

Madu, M.E. (2016) 'Governance and rural electrification in Nigeria: Challenges and prospects', *Energy Policy Journal*, 92, pp. 260–272.

Mehlwana, M. (2004) 'Research and development needs for renewable energies in developing countries.' Available at: http://www.fvee.de/fileadmin/publikationen/Themenhefte/sf2004/sf2004_05.pdf

NERC (2016) *Mini-grid regulation.* Abuja: Nigerian Electricity Regulatory Commission. Available at https://minigrid.nerc.gov.ng/assets/documents_backup/2017%20NERC%20%20Mini-Grid%20Regulations.html

Ohiare, S. (2015) 'Expanding electricity access to all in Nigeria: A spatial planning and cost analysis', *Energy, Sustainability and Society*, 5(1), pp. 1–12.

Quist, J., Thissen, W. and Vergragt, P. (2013) 'The impact and spin-off of participatory backcasting: From vision to niche', *Technological Forecasting and Social Change*, 78(5), pp. 883–897.

Raven, R. (2007) 'Niche accumulation and hybridisation strategies in transitions to a sustainable energy system', *Energy Policy*, 35(4), pp. 2390–2400.

Richter, M. (2013) 'Business model innovation for sustainable energy: How German municipal utilities innovate for the energy transition', *Energy Policy*, 62, pp. 1226–1237.

Rotmans, J., Kemp, R. and van Asselt, M. (2001) 'More evolution than revolution: Transition management in public policy', *Foresight*, 3(1), pp. 15–31.

Rural Electrification Agency (REA) (2020) *Nigeria Electrification Project Progress Report.* Abuja: REA.

Santika, W.G., Anisuzzaman, M., Bahri, P.A., Shafiullah, G.M., Rupf, G.V. and Urmee, T. (2019) 'From goals to joules: A quantitative approach to measuring sustainable development goal interactions', *Energy Research & Social Science*, 50, pp. 201–214.

Shaaban, M. and Petinrin, J. (2014) 'Renewable energy potentials in Nigeria: Meeting rural energy needs', *Renewable and Sustainable Energy Reviews*, 29, pp. 72–84.

Smith, A. and Raven, R. (2012) 'What is protective space? Reconsidering niches in transitions to sustainability', *Energy Policy*, 45, pp. 58–68.

Smith, A. and Stirling, A. (2008) 'Social-ecological resilience and socio-technical transitions: Critical issues for sustainability governance', *Ecology and Society*, 13(1), p. 11.

Sreekumar, N. (2008) 'Market-oriented power sector reforms: A critique', *IUP Journal of Governance and Public Policy*, 3(2–3), pp. 25–48.

Utuk, I.O. (2014) 'Participatory community-driven development and sustainable rural development in Nigeria', *IOSR Journal of Humanities and Social Science*, 19(9), pp. 31–36.

Verbong, G.P.J. and Geels, F.W. (2010) 'Exploring sustainability transitions in the electricity sector with the multi-level perspective', *Technological Forecasting and Social Change*, 77(8), pp. 1214–1221.

Yakubu, A., Ayandele, E., Sherwood, J., Olu, A.O. and Graber, S. (2018) *Mini-grid investment report: Scaling the Nigerian market.* Abuja: Nigerian Economic Summit Group. Available at https://rmi.org/wp-content/uploads/2018/08/RMI_Nigeria_Minigrid_Investment_Report_2018.pdf