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Understanding the Policy-Performance Nexus in Sierra Leone's Energy Sector: Toward a New Framework for Service Delivery

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ABSTRACT

Sierra Leone's energy sector has long been constrained by limited access, weak governance, and dependence on donor-funded interventions. Despite ambitious policies and reforms, service delivery outcomes remained poor. This study investigated the policy–performance nexus to understand why ambitious policies often fail to translate into reliable, affordable, and sustainable electricity services. A mixed-methods approach was employed, combining quantitative household surveys (with a 95% response rate) with qualitative key informant interviews, focus group discussions, and secondary data analysis. This design enabled triangulation of findings across citizen perceptions, institutional perspectives, and policy documents. The findings indicated that energy policies in Sierra Leone were ambitious but undermined by weak implementation, corruption, political interference, and utility inefficiencies. Quantitative results showed that most households perceived electricity as unaffordable, unreliable, and unfairly distributed. Qualitative insights revealed governance deficits, including illegal connections, opaque billing systems, and weak regulatory enforcement. Donor-funded renewable energy projects were found to be unsustainable when community ownership, integration, and capacity-building were absent. The study concluded that Sierra Leone's energy sector challenges were not due to a lack of policy ambition but to systemic governance and institutional weaknesses. To bridge the gap between policy and performance, a hybrid framework was proposed, emphasising strong governance, financial sustainability, renewable energy expansion, and community inclusion. This framework offers lessons for policymakers, donors, and regional stakeholders on advancing resilient and inclusive energy systems in fragile contexts.

Keywords: Energy policy; Energy governance; Renewable energy; Sierra Leone; Policy - Performance nexus

INTRODUCTION

Overview

Energy remains the cornerstone of socio-economic transformation, shaping industrialisation, service delivery, and inclusive development. For Sierra Leone, an energy-secure future is indispensable to achieving the aspirations of the *National Development Plan (2019–2023)* and the global commitments of the *Sustainable Development Goals (SDGs)*, particularly SDG 7, which seeks to ensure access to affordable, reliable, sustainable, and modern energy for all by 2030 (United Nations, 2023). Despite these ambitions, the nation's energy sector faces significant challenges: low electrification rates (approximately 31% nationally and 7% in rural areas), high system losses, dependence on imported petroleum products, and insufficient investment in

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renewable energy (World Bank, 2023). These issues highlight the structural weaknesses in policy design, institutional coordination, and performance monitoring, underscoring the need for a new framework in energy service delivery.

In West Africa, benchmarks from peer countries highlight opportunities for Sierra Leone. Ghana, for instance, has achieved nearly 88% electrification through strong rural electrification programs, public–private partnerships, and renewable energy expansion (Energy Commission of Ghana, 2022). Similarly, Senegal has made significant progress in scaling up solar power through its *Plan Sénégal Émergent*, aiming for universal access by 2025 and positioning renewables as a strategic growth driver (International Renewable Energy Agency [IRENA], 2023). These best practices demonstrate how coherent policy frameworks, strategic investments, and institutional accountability can yield tangible results.

Sierra Leone's energy sector policy targets are ambitious but attainable. The government's *Energy Sector Reform Roadmap (2021–2030)* aims to achieve at least 85% nationwide electricity access by 2030, with renewable energy contributing over 60% of the national energy mix (Ministry of Energy, 2022). Planned investments include expanding the Bumbuna hydroelectric project, integrating solar mini-grids in off-grid communities, and modernising transmission and distribution networks to reduce non-technical losses. Furthermore, the adoption of results-based financing and performance contracts with utilities, as seen in Côte d'Ivoire's energy sector, represents an emerging strategy to enhance accountability and service outcomes (African Development Bank [AfDB], 2023).

Current progress remains uneven. While generation capacity has increased to over 300 MW, primarily from hydro and thermal sources, distribution bottlenecks, high tariffs, and inadequate rural infrastructure constrain performance (World Bank, 2023). Moreover, institutional overlaps between the Ministry of Energy, the Electricity Distribution and Supply Authority (EDSA), and private operators have slowed reforms. To overcome these barriers, Sierra Leone must strengthen regulatory oversight, attract private sector participation, and leverage digital solutions to achieve efficiency gains.

Ultimately, understanding the policy-performance nexus requires not only diagnosing gaps but also proposing adaptive strategies rooted in regional best practices. A coherent framework that links policy intent with measurable outcomes, guided by benchmarks from Ghana, Senegal, and Côte d'Ivoire, offers Sierra Leone a viable path toward sustainable, inclusive, and resilient energy service delivery.

Background of the Study

Energy is universally acknowledged as a fundamental driver of socio-economic transformation. Access to affordable, reliable, and sustainable energy is not only a prerequisite for industrialisation, healthcare delivery, education, and digital connectivity, but also for achieving inclusive growth and climate resilience. The global development agenda, particularly *Sustainable Development Goal (SDG) 7*, commits the international community to ensuring universal energy access, doubling energy efficiency, and substantially increasing the share of renewables by 2030 (United Nations, 2023). Despite these ambitions, the *International Energy Agency (IEA, 2022)* reports that around 675 million people worldwide still lack access to electricity, with the vast majority living in Sub-Saharan Africa.

Globally, progress in energy access has been uneven, with significant advancements in Asia but persistent gaps in Africa. Countries such as China and India have made significant gains in electrification through aggressive policy reforms, large-scale investments in renewable energy, and rural grid extensions. These global experiences illustrate the critical role of integrated energy policies, financial mobilisation, and governance structures in ensuring that energy transitions are both inclusive and sustainable (IRENA, 2023).

Africa faces the most acute energy access challenges. The continent is home to approximately 600 million people without access to electricity, accounting for 80% of the global total (African Development Bank [AfDB], 2023). The energy deficit undermines industrial growth, weakens public health systems, constrains digital innovation, and perpetuates poverty. However, Africa possesses some of the world's richest renewable energy resources, including abundant hydro resources, vast solar potential, and growing wind and geothermal

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capacity. Harnessing these resources has become central to continental strategies such as the *African Union's Agenda 2063*, which underscores energy as a backbone of socio-economic transformation.

Despite the potential, weak institutional frameworks, limited financing, and fragmented regional integration have constrained progress. Regional initiatives such as the *West African Power Pool (WAPP)* aim to improve cross-border electricity trade and efficiency but are hindered by political and infrastructural bottlenecks (World Bank, 2023). For Africa to meet SDG 7 and its own long-term development goals, policies must evolve beyond targets to incorporate mechanisms for accountability, innovation, and performance monitoring.

In West Africa, several countries provide compelling benchmarks for Sierra Leone. Ghana stands out with electrification rates exceeding 88%, achieved through its *National Electrification Scheme* and sustained rural programs backed by donor support and private sector engagement (Energy Commission of Ghana, 2022). The country's integration of renewable energy and digital monitoring systems has improved efficiency and widened access.

Senegal has pioneered the adoption of renewable energy through its *Plan Sénégal Émergent*, positioning solar energy as a strategic growth driver. The commissioning of large-scale solar plants, including Senergy and Kahone, has contributed to steady progress toward the national target of universal access by 2025 (International Renewable Energy Agency [IRENA], 2023). Côte d'Ivoire, on the other hand, has focused on strengthening institutional accountability by adopting performance-based contracts with private operators to expand capacity and enhance efficiency. Nigeria has advanced rural electrification through mini-grid regulations that have successfully attracted private investment. These benchmarks highlight critical lessons: the importance of political commitment, the mobilisation of private capital, innovative financing instruments, and effective regulatory oversight. They also demonstrate that energy access expansion is not solely dependent on infrastructure, but also on coherent policy frameworks and institutional performance.

Sierra Leone remains one of the least electrified countries in the region. National access stands at approximately 31%, with rural access as low as 7% - far below the West African average (World Bank, 2023). Installed capacity is just over 300 MW, sourced from hydro, thermal, and limited solar projects. However, the sector is plagued by high system losses exceeding 35%, unreliable supply, and dependence on expensive imported petroleum products. Tariffs remain among the highest in the region, relative to income levels, which reduces affordability for households and businesses (Ministry of Energy, 2022).

Institutionally, fragmentation weakens performance. The Ministry of Energy provides policy direction, while the Electricity Distribution and Supply Authority (EDSA) and the Electricity Generation and Transmission Company (EGTC) handle operations. Nevertheless, overlapping roles, weak regulation, and limited capacity hinder accountability. These challenges reveal a significant gap between policy intent and service delivery outcomes.

Recognising these deficiencies, Sierra Leone has articulated an ambitious *Energy Sector Reform Roadmap (2021–2030)*. The roadmap aims for 85% electrification by 2030, with renewables accounting for 60% of the supply (Ministry of Energy, 2022). Planned interventions include the expansion of the Bumbuna hydroelectric project, investment in solar mini-grids for rural communities, upgrading transmission and distribution networks, and deploying innovative grid technologies to reduce technical and commercial losses.

The government also intends to replicate successful regional practices by adopting results-based financing and attracting private investment through public–private partnerships. Partnerships with multilateral development banks, bilateral donors, and independent power producers are being pursued to mobilise capital. However, successful implementation will require coherent governance reforms, effective monitoring and evaluation systems, and stronger coordination among institutions.

Statement of the Problem

Energy has long been recognised as a cornerstone of Sierra Leone's socio-economic development. In the decades following independence, the country made modest investments in electricity generation, primarily

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through the Bumbuna hydroelectric project, alongside a small network of thermal plants to support Freetown and regional towns. However, the civil conflict of the 1990s devastated infrastructure, leaving the sector fragile and underfunded. By the early 2000s, Sierra Leone's energy landscape was characterised by extremely low electrification rates, dilapidated infrastructure, and over-reliance on imported petroleum products. These conditions severely constrained industrialisation, access to social services, and overall national competitiveness.

Today, despite some progress, the energy sector remains among the least developed in West Africa. The current electrification rate stands at approximately 31% nationally and only 7% in rural areas, which is significantly lower than that of regional peers such as Ghana (88%) and Senegal (77%) (World Bank, 2023; IRENA, 2023). Installed capacity has expanded to over 300 MW, with contributions from hydropower, thermal plants, and solar mini-grids. However, the sector is plagued by inefficiencies, system losses above 35%, weak transmission networks, and high tariffs that undermine affordability for households and businesses. Institutional fragmentation further complicates progress, with overlapping mandates between the Ministry of Energy, the Electricity Distribution and Supply Authority (EDSA), and the Electricity Generation and Transmission Company (EGTC) leading to duplication, slow reforms, and limited accountability.

This gap between policy intent and performance outcomes lies at the heart of Sierra Leone's energy dilemma. Successive governments have articulated ambitious energy policies and strategies, including the *National Energy Policy (2017)* and the *Energy Sector Reform Roadmap (2021–2030)*, which aim to achieve 85% electrification by 2030, with 60% of the supply coming from renewable sources (Ministry of Energy, 2022). However, translating these targets into measurable outcomes has been slow and uneven. Weak monitoring frameworks, inadequate financing, and limited technical capacity result in policy commitments often remaining aspirational rather than transformative. The result is a persistent mismatch between the scale of Sierra Leone's energy challenges and the impact of policy interventions.

The implications of this policy–performance gap is profound. Limited energy access constrains industrial growth, particularly in energy-intensive sectors such as mining, manufacturing, and agriculture. It weakens healthcare delivery, restricts digital innovation, and perpetuates rural poverty by denying millions of citizens access to basic services. Moreover, dependence on costly imported fuels exposes the country to global price shocks, contributing to high tariffs and fiscal pressures. At a time when regional peers are advancing toward universal access through innovative financing models, renewable energy investments, and strong institutional frameworks, Sierra Leone risks being left behind.

The government's 2030 vision for the energy sector is ambitious: achieving near-universal access, mainly powered by renewables, supported by modern infrastructure, and underpinned by efficient and accountable institutions. This aligns with global commitments under SDG 7 and regional aspirations for sustainable energy transitions. However, achieving this vision requires a fundamental shift in how policies are designed, implemented, and monitored. It demands a framework that strengthens institutional coordination, attracts private investment, enhances accountability, and ensures that performance outcomes align with stated policy goals.

Therefore, the central problem this study addresses is the disconnect between energy policy formulation and actual performance in service delivery. Although Sierra Leone has established laudable policy targets, weak institutional capacity, fragmented governance structures, and inadequate financing have limited progress. To move from aspiration to realisation, the country must bridge the policy–performance nexus by learning from regional best practices, recalibrating strategies, and establishing a coherent framework that links policy intent with measurable results. Only through such a transformation can Sierra Leone transition from its current state, marked by fragility and underperformance, to where it aspires to be: a nation powered by inclusive, sustainable, and resilient energy systems.

Research Objectives

The overall objective of this study was to examine the policy–performance nexus in Sierra Leone's energy sector and propose a new framework for improving energy service delivery.

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Specific Objectives

1. To analyse the historical trajectory of Sierra Leone's energy policies and their impact on sector performance.

2. To evaluate the current status of energy access, generation, transmission, and distribution in Sierra Leone in relation to regional benchmarks.

3. To identify institutional, financial, and governance challenges that contribute to the policy–performance gap in the energy sector.

4. To explore best practices from West African countries such as Ghana, Senegal, and Côte d'Ivoire that have successfully aligned energy policies with service delivery outcomes.

5. To develop a policy–performance framework tailored to Sierra Leone that strengthens institutional accountability, promotes renewable energy adoption, and enhances private sector participation.

Research Questions

1. What has been the historical evolution of Sierra Leone's energy policies, and how have these shaped sector performances?

2. What is the current status of energy access, generation capacity, transmission, and distribution in Sierra Leone compared to regional benchmarks?

3. What institutional, financial, and governance factors contribute to the persistent gap between energy policies and actual performance in Sierra Leone?

4. What lessons can Sierra Leone learn from West African countries that have successfully aligned energy policy with service delivery outcomes?

5. How can Sierra Leone design and implement a policy–performance framework that ensures accountability, attracts investment, and accelerates progress toward universal, sustainable, and inclusive energy access?

Significance of the Study

This study is significant because it addresses one of Sierra Leone's most pressing development challenges: the persistent gap between energy policy formulation and performance outcomes. By examining the policy–performance nexus, the study offers evidence-based insights that can inform government decision-making and ensure that energy policies transition from aspirational targets to measurable, transformative outcomes. For policymakers, the findings will offer practical recommendations for strengthening institutional accountability, aligning regulatory frameworks, and enhancing sector governance.

For the private sector, the study underscores opportunities for increased participation in Sierra Leone's energy transition. Reliable and sustainable energy systems are critical for industrial growth, entrepreneurship, and digital innovation. By identifying barriers to private sector involvement and proposing frameworks that encourage public–private partnerships, the study can support investment confidence and foster an environment that enables business growth. This is particularly relevant as the government seeks to attract independent power producers and leverage innovative financing models.

At the regional level, the study contributes to West Africa's broader efforts for energy integration under the West African Power Pool (WAPP). By benchmarking Sierra Leone's performance against regional peers such as Ghana, Senegal, and Côte d'Ivoire, the research highlights lessons that can accelerate progress toward universal access. This comparative perspective not only enriches policy design but also strengthens Sierra

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Leone's contribution to regional cooperation on energy security, renewable adoption, and cross-border power trade.

Academically, the study fills a critical gap in the literature on fragile states and energy governance. While many studies focus on advanced or emerging economies, limited attention has been given to small, post-conflict nations such as Sierra Leone. By situating the country's experience within broader theoretical and empirical debates, the research advances knowledge on the interplay between policy, institutions, and performance in energy service delivery.

Ultimately, this study is both timely and necessary. It offers a practical roadmap for Sierra Leone to transition from chronic energy underperformance to a future of sustainable, inclusive, and resilient energy access, contributing to national development and regional competitiveness.

Scope of the Study

This study focused on understanding the policy–performance nexus in Sierra Leone's energy sector to propose a new framework for effective service delivery. The scope is designed to provide clarity on the boundaries within which the research is conducted, while also acknowledging its limitations.

The study is geographically limited to Sierra Leone, examining national energy policies, institutional frameworks, and sector performance. Particular attention is given to both urban centres, such as Freetown, where electricity access is relatively higher, and rural communities, where access remains critically low at around 7% (World Bank, 2023). While the primary focus is on Sierra Leone, comparative insights are drawn from regional benchmarks in West Africa, specifically Ghana, Senegal, and Côte d'Ivoire, to highlight best practices and lessons applicable to Sierra Leone's context.

The study covers the period from **2000 to 2030**. The starting point reflects the post-conflict reconstruction era, during which significant reforms in the energy sector began. The end point aligns with Sierra Leone's *Energy Sector Reform Roadmap (2021–2030)* and the global deadline for achieving *Sustainable Development Goal 7 (SDG 7)* on universal access to energy. This timeframe enables an assessment of historical trajectories, current realities, and future targets.

Thematically, the research is centred on the interplay between energy policies and actual performance outcomes. Areas of focus include access to electricity, generation capacity, adoption of renewable energy, institutional arrangements, financing mechanisms, and governance structures. The study does not provide detailed technical designs of power projects but instead emphasises policy frameworks, institutional performance, and service delivery impacts.

The research adopts a qualitative and comparative approach, drawing on secondary data from government reports, international organisations, and scholarly publications. Regional best practices are examined to identify adaptable strategies for Sierra Leone. The analysis is interpretive, aiming to build a conceptual framework rather than to provide econometric modelling.

Limitations:

The study is limited by reliance on secondary data, which may not always capture the most recent sectoral developments. Furthermore, while regional benchmarks are included, contextual differences may limit the direct transferability of best practices. Nonetheless, the study offers valuable insights for refining policy and strategic planning.

Organisation of Chapter One

Chapter One introduces the study and sets the foundation for the entire research. It is organised into the following sections:

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1. **Background of the Study**

This section provided a comprehensive overview of global, regional, and national energy issues, emphasising the crucial role of energy in driving socio-economic development. It narrows the discussion from global and African contexts to the specific challenges and opportunities in Sierra Leone's energy sector.

2. **Statement of the Problem**

Here, the central research problem is articulated. The section traced the origins of Sierra Leone's energy sector, its current state, and its future aspirations, while emphasising the gap between policy aspirations and actual performance outcomes.

3. **Research Objectives**

The study's overall objective and specific objectives are presented. These objectives outlined the main goals of the research and guide the investigation into the policy–performance nexus.

4. **Research Questions**

This section formulates the key questions that the study seeks to answer. These questions are aligned with the objectives and frame the empirical and theoretical inquiry.

5. **Significance of the Study**

This section highlighted the significance of the research for policymakers, the private sector, regional integration efforts, and the academic community. It demonstrates the study's contribution to national development and scholarly debates on energy governance.

6. **Scope of the Study**

This section defined the geographical, temporal, thematic, and methodological boundaries of the study, while also acknowledging its limitations. It ensures clarity on what the research covers and excludes.

7. **Organisation of the Study**

Finally, the chapter concludes by outlining the structure of the entire dissertation. It provides a chapter-by-chapter breakdown to show how the study flows from introduction to conclusion.

LITERATURE REVIEW

Overview

The purpose of this literature review is to establish the intellectual and analytical foundation for understanding the policy–performance nexus in Sierra Leone’s energy sector. A literature review does more than summarise existing knowledge; it critically synthesises theoretical perspectives, empirical evidence, and conceptual insights to identify patterns, contradictions, and gaps that inform the present study (Creswell & Creswell, 2021). Within the energy context, this is particularly important, as service delivery outcomes depend not only on the presence of sound policies but also on the systems through which such policies are implemented and the performance frameworks that evaluate their impact.

This chapter links policy, systems, and performance in order to unpack why ambitious energy reforms in many developing countries, including Sierra Leone, often yield uneven results. Policies provide the strategic vision and direction, but their effectiveness is mediated by systemic factors such as institutional capacity, financing arrangements, and technological adoption. Ultimately, performance outcomes, measured in terms of access, reliability, affordability, and sustainability, reveal whether policies have been successfully translated into

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tangible benefits for citizens. By highlighting this triangular relationship, the review situates Sierra Leone's experience within both regional benchmarks and global best practices.

The structure of the chapter is organised into five key parts. It begins with a conceptual review, which defines critical terms and presents the study's conceptual framework. A theoretical review of models relevant to policy implementation and governance follows this. The empirical review then explores global, African, West African, and Sierra Leonean perspectives. The chapter concludes with a synthesis of gaps and a summary, which together set the stage for the methodological approach in Chapter Three.

Conceptual Review

Definition of Key Concepts

Policy and Energy Policy

Policy is broadly understood as a deliberate course of action or inaction chosen by governments or institutions to address a particular issue or achieve specific objectives (Anderson, 2021). In the context of public administration, policy serves as both a guide and framework for decision-making, resource allocation, and implementation strategies.

Energy policy, therefore, refers to the set of decisions, rules, and strategies adopted by governments to regulate, manage, and expand energy production, distribution, and consumption (Sovacool & Griffiths, 2020). It encompasses diverse dimensions, including energy access, affordability, sustainability, security, and the transition to renewable energy sources. For developing countries like Sierra Leone, energy policy must strike a balance between national development priorities and global imperatives, particularly in terms of climate resilience and achieving Sustainable Development Goal 7 (SDG 7) (IEA, 2022).

Performance and Service Delivery in the Energy Sector

Performance in the energy sector is typically assessed through indicators such as efficiency, reliability, affordability, accessibility, and sustainability of energy services (World Bank, 2023). Service delivery, in this regard, extends beyond electricity generation to include equitable distribution, consistent supply, and customer satisfaction. In fragile economies, performance is often constrained by infrastructural deficits, financial mismanagement, and weak institutional capacity (Eberhard & Gratwick, 2021). Measuring performance thus requires a multidimensional lens that accounts for technical efficiency, governance, and citizen outcomes. For instance, Sierra Leone's electrification rate remains below 30 percent, reflecting a gap between policy intentions and actual service delivery (AfDB, 2023).

Systems Approach in Energy Governance

The systems approach views energy governance as an interconnected framework of policies, institutions, technologies, and actors that collectively shape outcomes (Meadowcroft & Florini, 2021). Rather than analysing isolated interventions, this approach highlights the interdependence between policy inputs, institutional structures, market dynamics, and external shocks. It highlights the need for systemic alignment to achieve transformative energy outcomes. In Sierra Leone, weak institutional coordination among the Ministry of Energy, Electricity Distribution and Supply Authority (EDSA), and other stakeholders has often undermined the effectiveness of reforms. A systems approach can therefore illuminate the pathways through which fragmented decision-making erodes efficiency, while integrated governance strengthens resilience (Odarno et al., 2020).

The "Policy–Performance Nexus"

The policy–performance nexus refers to the critical relationship between policy formulation and the outcomes achieved in service delivery. In theory, well-designed policies should lead to improved performance indicators; however, in practice, this nexus is often disrupted by implementation gaps, resource constraints, and institutional weaknesses (Peters, 2022). In the energy sector, the nexus is significant because policies must

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address multi-layered challenges such as affordability, inclusivity, and sustainability while navigating political and economic constraints. For Sierra Leone, understanding the policy–performance nexus means interrogating why ambitious policy goals such as the National Electricity Access Policy (NEAP), have not consistently translated into tangible improvements in electricity access and quality of service. This conceptual lens, therefore, frames the study's focus on aligning policies, systems, and performance outcomes for effective energy service delivery.

Energy as a Driver of Development

Energy is widely regarded as a fundamental driver of socio-economic transformation. Reliable, affordable, and sustainable energy enables industrialisation, agricultural productivity, healthcare, education, and digital innovation, thereby contributing directly to inclusive growth and poverty reduction (World Bank, 2023). Without adequate energy, economies struggle to industrialise, public services remain inefficient, and citizens are excluded from opportunities in the modern digital economy. Thus, energy is not simply a sectoral priority but a cross-cutting enabler of development that underpins progress toward multiple Sustainable Development Goals (SDGs).

From a global perspective, the United Nations' Sustainable Development Goal 7 (SDG 7) to "ensure access to affordable, reliable, sustainable, and modern energy for all" - recognises energy as central to human development and environmental sustainability. According to the International Energy Agency (IEA, 2023), achieving universal electricity access by 2030 is not only an energy target but a prerequisite for broader development outcomes such as reducing inequality, strengthening resilience, and advancing climate action. Countries that have successfully expanded energy access, such as Vietnam and Brazil, have demonstrated how universal electrification accelerates industrial growth, enhances education, and stimulates private sector investment (IEA, 2022).

In Africa, energy is increasingly seen as the backbone of Agenda 2063, the African Union's long-term development vision. Despite significant potential in renewable resources, such as solar, wind, hydro, and biomass, the continent continues to face acute energy deficits. Over 600 million Africans still lack access to electricity, and nearly 900 million rely on traditional biomass for cooking, resulting in severe health and environmental consequences (AfDB, 2023). Energy insecurity remains a bottleneck to Africa's competitiveness in global markets, constraining industrialisation, technological advancement, and job creation. The African Development Bank (AfDB) argues that closing Africa's energy gap could increase economic growth by 2-4% annually and facilitate structural transformation (AfDB, 2022).

West Africa provides both cautionary lessons and best-practice benchmarks. Ghana's National Electrification Scheme, launched in 1989, raised electricity access from less than 25% in the 1990s to over 80% by 2020, mainly through grid expansion, rural electrification programmes, and renewable energy investments (Kumi, 2021). Similarly, Côte d'Ivoire has achieved near-universal access through sustained investment in hydropower and a stable regulatory framework (IEA, 2022). Nigeria, despite being the region's largest economy and energy producer, still struggles with chronic underperformance, unreliable supply, and governance deficits, illustrating how policy incoherence and weak institutions undermine service delivery (Odarno et al., 2020). The West African Power Pool (WAPP), established by ECOWAS, is another important benchmark, aiming to create a regional electricity market that enhances supply reliability and reduces costs through cross-border power trade (ECOWAS, 2022).

In Sierra Leone, energy's role as a driver of development is both urgent and transformative. The country's electrification rate remains below 30%, with rural areas severely underserved (World Bank, 2023). This limited access constrains business productivity, discourages foreign investment, and restricts opportunities for digital innovation, particularly for young people and women. Frequent outages and high electricity tariffs also undermine competitiveness in manufacturing, hospitality, and services. However, Sierra Leone possesses vast renewable energy potential, including solar, hydro, and biomass, which, if harnessed, could accelerate the government's ambitions for universal access under the National Renewable Energy Action Plan (NREAP). Expanding energy access would unlock opportunities for value addition in agriculture, improve health

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outcomes through reliable power in hospitals, and foster inclusive growth in line with the government's "Big Five" development priorities.

The energy is not merely an infrastructural issue but a central pillar of socio-economic transformation. For Sierra Leone, aligning energy policies with robust Implementation, regional integration, and sustainable financing is critical to leveraging energy as a catalyst for industrialisation, poverty reduction, and inclusive development.

Frameworks for Energy Service Delivery

Energy service delivery requires coherent frameworks that integrate policy, financing, institutional arrangements, and technology to ensure sustainable, affordable, and inclusive access to energy services. A framework for energy service delivery is essentially a structured approach that defines how policies are translated into systems, how systems mobilise resources, and how outcomes are measured against development goals (Eberhard & Gratwick, 2021). In fragile and developing contexts, such as Sierra Leone, the design of these frameworks is critical because poorly aligned policies and institutions often result in service deficits despite the country's abundant natural resources.

Universal Access and Just Energy Transition

The concept of universal access underpins global frameworks, such as Sustainable Development Goal 7 (SDG 7)**,** which aims to provide "affordable, reliable, sustainable, and modern energy for all" by 2030 (World Bank, 2023). Achieving universal access requires both grid expansion in urban centres and decentralised solutions such as mini-grids and solar home systems for rural areas (IEA, 2023). In recent years, the discourse has expanded to include the idea of a "just energy transition," which emphasises that the shift from fossil fuels to renewables must be inclusive, equitable, and sensitive to vulnerable populations (Sovacool et al., 2021). In West Africa, this has meant ensuring that rural communities, women, and low-income households benefit equally from renewable energy investments, rather than being excluded by affordability or access barriers.

Resilience and Sustainability

Another critical dimension of the energy service delivery framework is resilience, especially in the face of climate change, economic volatility, and geopolitical disruptions. A resilient energy framework integrates renewable energy technologies, diversified supply sources, and climate-adaptive infrastructure to reduce vulnerability to external shocks (Meadowcroft & Florini, 2021). For Sierra Leone, frequent fuel price fluctuations and the impacts of climate change on hydropower capacity illustrate the importance of resilience in planning. Sustainability also entails reducing dependence on imported fossil fuels and harnessing domestic renewable resources such as solar, wind, and hydro, which are abundant yet underutilised.

Equity and Inclusion

Equity is a defining feature of effective service delivery frameworks. Energy poverty disproportionately affects rural populations, women, and youth in fragile economies (UNDP, 2022). Therefore, energy frameworks must incorporate mechanisms to address inequalities in access, affordability, and quality of service. This includes targeted subsidies for the poor, gender-sensitive energy policies, and community-based electrification initiatives. For example, Ghana's rural electrification programme and Kenya's Last Mile Connectivity Project demonstrate how equity can be mainstreamed into policy and practice (Kumi, 2021; Odarno et al., 2020). In Sierra Leone, however, access gaps persist between Freetown and rural districts, highlighting the need for equity-focused frameworks.

Financing and Institutional Models

Financing remains a central pillar of energy service delivery frameworks. Traditional state-led financing is being increasingly supplemented by Public–Private Partnerships (PPPs)**,** donor support, and innovative mechanisms such as Results-Based Financing (RBF) and blended finance (AfDB, 2022). These models are designed to attract private investment while ensuring public oversight and accountability. Institutional

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frameworks must also ensure coordination between ministries, regulators, utilities, and local governments to prevent fragmentation. For Sierra Leone, limited fiscal space means innovative financing models, such as community-owned mini-grids supported by development partners, are crucial for scaling access (World Bank, 2023).

Regional and Global Alignment

Regional bodies, such as ECOWAS and the West African Power Pool (WAPP)**,** provide frameworks that complement national strategies by fostering regional integration, promoting cross-border electricity trade, and harmonising regulatory environments (ECOWAS, 2022). Globally, initiatives such as Sustainable Energy for All (SEforALL) and the Paris Climate Agreement also shape national frameworks by setting targets for decarbonisation, renewable adoption, and universal access. Aligning Sierra Leone's frameworks with regional and global benchmarks is essential for mobilising investment and achieving sustainable outcomes.

Implications for Sierra Leone

Sierra Leone, the challenge lies not in the absence of frameworks but in their weak Implementation. While the National Renewable Energy Action Plan (NREAP) and National Electricity Access Policy (NEAP) provide ambitious roadmaps, institutional bottlenecks, financing constraints, and capacity gaps have limited their impact. A reformed framework for energy service delivery in Sierra Leone must therefore integrate universal access targets, resilience-building, equity considerations, and innovative financing within a coherent governance structure. This alignment is necessary to bridge the persistent gap between policy ambition and performance outcomes.

Conceptual Framework

A conceptual framework provides the analytical lens through which the study examines the relationship between policy, systems, and performance in Sierra Leone's energy sector. It serves as a bridge between theory and practice, helping to operationalise abstract concepts into measurable variables (Creswell & Creswell, 2021). For this study, the framework captures the policy - performance nexus by highlighting how policy inputs interact with systemic factors to influence performance outcomes in energy service delivery.

Independent Variables (Policy Inputs)

Policies serve as the foundation of the framework, representing the government's strategies, commitments, and regulatory instruments designed to enhance energy access and reliability. The key policy inputs include:

i. Energy Policies and Reforms – National Electricity Access Policy (NEAP), National Renewable Energy Action Plan (NREAP), and other legislative frameworks designed to expand access and transition towards renewables.

ii. Institutional and Governance Structures – Role of the Ministry of Energy, Electricity Distribution and Supply Authority (EDSA), Electricity Generation and Transmission Company (EGTC), and related agencies in Implementation.

iii. Financing and Investment Models – State funding, donor aid, Public–Private Partnerships (PPPs), and Results-Based Financing (RBF).

iv. Regulatory and Legal Environment – Tariff-setting mechanisms, energy regulations, and enforcement of quality standards.

These policy inputs represent the formal intentions and frameworks designed to drive the sector forward.

Intervening Variables (Systemic and Contextual Factors)

Even well-crafted policies can fail to achieve intended outcomes if systemic or contextual barriers undermine Implementation. Intervening variables include:

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i. Institutional Capacity and Political Will – The ability of institutions to coordinate, enforce regulations, and resist political interference.

ii. Regional Integration – Participation in the West African Power Pool (WAPP) and ECOWAS energy cooperation.

iii. Global and Local Shocks – Climate change impacts on hydropower, fuel price volatility, and post-conflict fragility.

iv. Technology and Innovation – Adoption of renewable energy solutions, smart grids, and digital payment systems for electricity.

These variables represent the environmental conditions that either enable or constrain the effective translation of policy into performance.

Dependent Variables (Performance Outcomes)

The dependent variables reflect the outcomes of energy policies as measured by service delivery indicators. For Sierra Leone, these include:

i. Electricity Access Rates – Proportion of households and businesses with reliable electricity (urban and rural).

ii. Reliability and Quality of Supply – Reduction in outages, load shedding, and system losses.

iii. Affordability and Equity – Cost of electricity relative to household income and equitable access for marginalised groups.

iv. Renewable Energy Penetration – Share of solar, hydro, and other renewables in the national energy mix.

v. Sustainability of Energy Services – Long-term viability of supply systems, including environmental and financial sustainability.

Together, these outcomes provide a multidimensional assessment of performance.

Diagrammatic Representation of the Framework

The conceptual framework can be represented as a three-tier model**:**

1. **Policy Inputs (Independent Variables)** → 2. **Systemic/Intervening Factors** → 3. **Performance Outcomes (Dependent Variables)**

Visually, the framework would appear as:

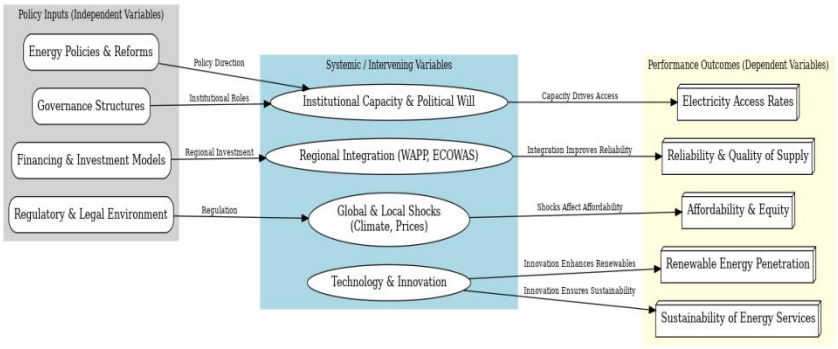

Figure 2.1: Conceptual Framework for the Policy–Performance Nexus in Sierra Leone's Energy Sector.

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The conceptual framework illustrates the relationship between policy inputs, systemic/intervening variables, and performance outcomes in Sierra Leone's energy sector. It highlights how policies and governance structures interact with institutional, regional, and global dynamics to influence service delivery outcomes, including access, reliability, affordability, renewable energy penetration, and sustainability.

The framework is informed by governance and policy implementation theories, which emphasise the interaction between policy design and contextual realities (Peters, 2022). It also draws from systems theory, recognising that energy governance is not linear but shaped by interdependencies among institutions, markets, and global forces (Meadowcroft & Florini, 2021). Sierra Leone, this framework is particularly relevant because past reforms have often been strong in policy formulation but weak in performance outcomes, due to systemic constraints such as institutional fragmentation, financing deficits, and low technical capacity (AfDB, 2023; World Bank, 2023).

By articulating the relationships among policy inputs, systemic factors, and outcomes, the framework provides a structured approach to interrogating why ambitious energy policies in Sierra Leone have not consistently translated into reliable, affordable, and sustainable service delivery. It also guides the empirical investigation of this study, ensuring alignment between conceptual clarity, research objectives, and analytical focus.

Theoretical Review

The theoretical review situates this study within frameworks that illuminate the relationship between policy ambition, systemic constraints, and performance outcomes in Sierra Leone's energy sector. Governance theory emphasises the importance of transparency, accountability, and institutional checks for effective service delivery.

Thus far, in fragile states, weak regulatory environments and political interference often compromise implementation. Institutional theory further explains how entrenched structures and norms shape the capacity of agencies like EDSA and EWRC to enforce reforms. In contrast, public choice theory underscores how rent-seeking behaviour and elite capture divert resources away from citizens' needs.

In addition, energy transition and innovation theories highlight the role of renewable technologies, financing models, and community participation in achieving sustainability. These perspectives reveal that bridging policy and performance requires not only ambitious planning but also systemic reforms that align incentives, strengthen institutions, and expand access to opportunities.

Through integrating these theoretical lenses, the review provides a robust foundation for interrogating why energy policies remain ambitious in design yet weak in practice, and how a transformative, context-sensitive framework could improve reliability, affordability, and equity in Sierra Leone's electricity sector.

Policy Implementation Theories

Policy implementation remains one of the most critical yet challenging stages in the policy process. While the formulation of ambitious policies reflects governmental intent, it is Implementation that determines whether policy goals translate into tangible outcomes for citizens. Pressman and Wildavsky's (2020) classic analysis in *Implementation* underscored how the success or failure of public policies is often decided not in the drafting rooms of policymakers but in the complex networks of institutions, bureaucrats, and local actors tasked with execution. In the energy sector, this tension is particularly pronounced, given that energy is a highly technical, capital-intensive, and politically sensitive domain where outcomes affect economic growth, industrialisation, and human welfare (Eberhard & Gratwick, 2021).

Sierra Leone, a country striving to achieve universal electricity access amidst institutional fragility and resource constraints, understands that understanding the theories of policy implementation is indispensable. Despite multiple energy sector reforms - such as the Electricity Act (2011)**,** the National Electricity Access Policy (NEAP, 2015), and the National Renewable Energy Action Plan (NREAP, 2016) - performance outcomes remain modest, with electrification rates below 30 percent and persistent service reliability

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challenges (World Bank, 2023). This disconnect between policy ambitions and outcomes reflects the so-called "implementation gap" that many developing countries face.

To interrogate these dynamics, three theoretical lenses are beneficial: the top-down approach**,** the bottom-up perspective, and the policy cycle framework. Each provides distinctive insights into how policies are translated into practice, the actors that matter most, and the conditions under which Implementation succeeds or fails. Taken together, they shed light on why Sierra Leone's energy sector has struggled to meet its targets and how hybrid approaches could better align policy, systems, and performance.

The Top-down Perspective

The top-down model of policy implementation emerged in the 1970s, primarily through the works of Pressman and Wildavsky (2020) and Van Meter and Van Horn. This perspective views Implementation as a hierarchical process in which policymakers at the central level design clear objectives and rely on subordinate agencies to execute them faithfully. The underlying assumption is that if goals are unambiguous, resources are sufficient, and authority is respected, policies will be implemented successfully (Matland, 2021).

Key Assumptions and Features

Top-down theorists argue that effective Implementation depends on:

i. Clarity of Objectives – Policy goals must be explicit and measurable.

ii. Adequate Resources – Financial, technical, and human resources must be available to executing agencies.

iii. Control Mechanisms – Authority must flow downward, ensuring compliance by lower-level actors.

iv. Minimal Distortion – Implementers should carry out directives without reinterpretation or resistance.

This perspective resonates strongly in energy governance, where governments often centralise decision-making to mobilise resources for large-scale infrastructure projects such as hydropower dams, national grids, or renewable energy rollouts. For example, Ghana's electrification success story is often attributed to clear national targets, central coordination, and strong alignment between donors and the government (Kumi, 2021).

Sierra Leone's energy reforms have followed mainly a top-down orientation. The Electricity Act of 2011, which unbundled generation, transmission, and distribution, was a centrally driven reform influenced by international best practices and donor recommendations (AfDB, 2023). Similarly, the National Renewable Energy Action Plan (NREAP) was formulated with technical assistance from international agencies and adopted by government ministries with minimal grassroots consultation. While these policies provided clear visions, their Implementation revealed the limitations of the top-down model. EDSA, the primary distribution utility, faces chronic capacity and financing challenges, leading to frequent outages and revenue shortfalls. Moreover, directives from the Ministry of Energy often clash with the realities faced by local operators and communities. For instance, rural electrification targets are undermined by logistical barriers, inadequate funding, and local resistance to tariffs that communities perceive as unaffordable.

The strength of the top-down approach lies in its ability to mobilise large-scale resources and enforce national priorities, which is critical in post-conflict states like Sierra Leone that require strong central direction. However, its limitations are equally profound: it neglects local contexts, assumes compliance, and often falters when institutional capacity is weak. As Matland (2021) observes, top-down models are most effective in stable environments with high institutional capacity, conditions that do not fully characterise Sierra Leone.

The Bottom-up perspective

In response to the rigidity of top-down models, the bottom-up perspective emerged in the late 1970s and early 1980s, associated with scholars such as Michael Lipsky and his concept of "street-level bureaucracy." This

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perspective argues that policies are not implemented exactly as written; instead, they are shaped by the discretion, capacity, and decisions of local actors, frontline workers, service providers, communities, and civil society (Lipsky, 2020).

Key Assumptions and Features

Bottom-up models stress that:

i. Local Actors Matter – Teachers, health workers, utility technicians, and local councils make real-time decisions that shape outcomes.

ii. Adaptation to Context – Policies must be interpreted and modified to suit local conditions.

iii. Participation and Engagement – Citizens, NGOs, and communities play an active role in shaping Implementation.

iv. Policy is Emergent – Implementation is not a mechanical process but an evolving negotiation among actors.

In energy governance, this approach emphasises decentralised electrification, community ownership of mini-grids, and partnerships with local NGOs and private operators. Kenya's Last Mile Connectivity Project and Tanzania's rural solar programmes exemplify bottom-up success by incorporating local participation and private investment (Odarno et al., 2020).

In Sierra Leone, bottom-up dynamics are evident in rural electrification initiatives. Donor-supported projects such as the Rural Renewable Energy Project (RREP) rely heavily on local councils, community-based organisations, and private solar companies. These actors adapt national policies to local needs by engaging communities in tariff design, training local technicians, and managing mini-grids. In some districts, community buy-in has proven crucial for sustaining projects beyond initial donor funding.

However, bottom-up approaches also face limitations. Local institutions in Sierra Leone often lack technical and managerial capacity, and community participation can be uneven. Without adequate support, decentralised projects risk fragmentation, with some communities benefiting while others remain excluded. Moreover, reliance on local actors may inadvertently reinforce inequalities if stronger communities attract more investment than marginalised ones.

The strength of bottom-up models lies in their responsiveness, inclusivity, and capacity to build ownership. They are particularly effective in fragile states where central capacity is weak but community resilience is strong. Nevertheless, their limitations include vulnerability to local power dynamics, lack of standardisation, and difficulties in scaling up. In Sierra Leone, bottom-up initiatives have shown promise but remain piecemeal compared to the scale of national electrification needs.

The Policy Cycle Framework

The policy cycle framework, developed in the mid-20th century and popularised by scholars like Lasswell and later Howlett (2020), conceptualises policymaking as a series of stages: agenda-setting, formulation, adoption, Implementation, and evaluation**.** This model provides a holistic view of the policy process, recognising that Implementation cannot be isolated from earlier and later stages.

The policy cycle assumes that policymaking is iterative, with feedback loops allowing for adaptation and learning. Implementation is thus situated within a broader cycle where policies are continuously refined based on performance and evaluation (Lasswell and later Howlett 2020).

In the energy sector, the policy cycle highlights the need for robust monitoring and evaluation mechanisms. For instance, agenda-setting requires identifying energy access as a priority; formulation involves designing

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technical and financial plans; adoption entails legislative approval; Implementation requires utilities and agencies to execute plans; and evaluation ensures accountability and learning.

In Sierra Leone, the policy cycle is often disrupted at the implementation and evaluation stages. Policies such as the NEAP set ambitious electrification targets; however, weak monitoring frameworks mean that progress is poorly tracked. Evaluation reports, when available, are rarely integrated into subsequent policy cycles, leading to repeated mistakes. For example, tariff reforms have been attempted multiple times without adequate stakeholder consultation, resulting in public resistance and policy reversals.

The policy cycle offers clarity, critics argue that it oversimplifies reality by presenting policymaking as a linear process. In practice, stages overlap, and political dynamics frequently disrupt rational cycles (Howlett, 2020). In fragile contexts like Sierra Leone, external shocks, such as fuel price hikes or donor conditionalities - often abruptly reshape policy priorities, making cycles less predictable.

Towards an Integrated/Hybrid Approach

Neither top-down nor bottom-up perspectives alone fully explain or address the complexities of policy implementation. Increasingly, scholars advocate for hybrid approaches that combine central direction with local adaptability, framed within iterative policy cycles (Peters, 2022).

Examples of Hybrid Approaches

i. South Africa's Renewable Energy Independent Power Producer Procurement Programme (REIPPPP) blends top-down regulation with bottom-up private sector participation and community benefit schemes (Eberhard & Gratwick, 2021).

ii. Ghana's electrification strategy combined central targets with community engagement and donor partnerships, resulting in rapid expansion.

In the case of Sierra Leone, a hybrid approach is essential. Central government must provide clear national direction, mobilise financing, and enforce regulatory standards (top-down). At the same time, local councils, private operators, and communities must adapt policies to local realities and build ownership (bottom-up). Embedding these processes within an iterative cycle of monitoring, feedback, and reform ensures continuous learning and adjustment. Such integration could transform the implementation gap into an opportunity for Implementation.

Policy implementation theories provide critical insights into why Sierra Leone's energy sector has struggled to translate ambitious policies into effective service delivery. The top-down perspective highlights the importance of central coordination but underestimates local realities. The bottom-up perspective effectively captures the role of local actors, but struggles with issues of scale and capacity. The policy cycle framework underscores the importance of feedback and learning, but risks oversimplification in fragile contexts. A hybrid approach that combines central direction, local engagement, and iterative cycles offers the most promising pathway for Sierra Leone to achieve universal energy access and sustainable service delivery.

Governance and Institutional Theories

Governance and institutional theories have become central to understanding the relationship between policy formulation and performance outcomes in public administration. While policy implementation theories explain how government intentions are translated into practice, governance and institutional theories delve deeper into the structures, rules, and relationships that shape behaviour and decision-making within organisations. They are particularly relevant in fragile states like Sierra Leone, where weak institutional capacity, limited accountability, and political interference have often undermined reform efforts in critical sectors such as energy (AfDB, 2023).

Governance refers to the mechanisms, processes, and traditions by which authority is exercised, including the selection, monitoring, and replacement of governments, as well as the accountability of institutions (World

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Bank, 2023). Institutional theory, on the other hand, focuses on how formal rules, norms, and informal practices shape the behaviour of organisations and actors (Peters, 2022). Together, these perspectives provide a powerful lens for analysing why ambitious reforms in Sierra Leone's energy sector have often failed to achieve intended outcomes, and how systemic weaknesses can be addressed.

This section discusses three key strands of governance and institutional theory: institutional theory**,** principal–agent theory**,** and good governance/new institutionalism. Each is examined in detail, highlighting its assumptions, strengths, limitations, and applications to energy sector reform, with particular emphasis on Sierra Leone and comparative insights from other African contexts.

Institutional Theory

Institutional theory emphasises the role of rules, norms, and structures in shaping organisational behaviour. Early institutionalists focused on formal institutions such as constitutions and laws, but "new institutionalism" introduced by March and Olsen expanded the analysis to include informal practices, path dependency, and the cultural embeddedness of institutions (Peters, 2022).

At its core, institutional theory suggests that organisations are not merely rational actors pursuing efficiency; instead, they are constrained and influenced by the institutional environments in which they operate. Institutions provide stability and predictability but can also create inertia, making reform difficult. In many developing countries, institutions evolve through processes of isomorphism where organisations mimic successful models from elsewhere, but often without the resources or capacities to make them work effectively (DiMaggio & Powell, 2020).

In the energy sector, institutional theory emphasises how formal structures, such as ministries, regulatory authorities, and utilities, are shaped not only by national laws but also by donor conditionalities, regional agreements, and cultural norms. For instance, reforms that unbundle generation, transmission, and distribution often mirror global best practices promoted by the World Bank and IMF but may not align with local realities (Eberhard & Gratwick, 2021).

Sierra Leone's energy sector exemplifies the challenges of institutional isomorphism. The unbundling of the National Power Authority into the Electricity Generation and Transmission Company (EGTC) and the Electricity Distribution and Supply Authority (EDSA) in 2011 followed international reform models; however, weak capacity and limited resources undermined its effectiveness. Regulatory agencies, such as the Electricity and Water Regulatory Commission (EWRC), exist on paper but often lack autonomy, expertise, or political backing to enforce their decisions.

Institutional path dependency also shapes outcomes. Decades of underinvestment, corruption, and civil conflict created entrenched practices of rent-seeking and informal service provision. Even with new policies, these historical legacies continue to influence energy governance. For example, informal electricity connections remain widespread in Freetown, reflecting weak enforcement capacity and a social norm of bypassing official systems.

Comparative African Insights from **o**ther African countries illustrate both the strengths and limitations of institutional reforms. Ghana's Public Utilities Regulatory Commission (PURC) exemplifies how robust regulatory institutions can foster accountability and consumer protection (Kumi, 2021). By contrast, Nigeria's power sector reforms, despite multiple restructuring efforts, have been undermined by entrenched institutional weaknesses, resulting in persistent inefficiencies and consumer dissatisfaction (Odarno et al., 2020). Sierra Leone more closely resembles the Nigerian case, underscoring the need for institutional strengthening that extends beyond formal structures.

Principal–Agent Theory

Principal–agent theory arises from economics and political science, focusing on the delegation of authority. The principal (such as government or parliament) delegates tasks to an agent (such as a ministry, regulator, or utility) who has more information about operations. This information asymmetry can create problems of moral

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hazard (agents pursuing their own interests) or **adverse selection** (agents hiding relevant information) (Miller, 2020). The theory assumes that principals must design mechanisms, such as contracts, incentives, and monitoring, to ensure that agents act in the principal's interest. Where monitoring is weak and incentives misaligned, agents may exploit discretion for private gain.

Energy governance is rife with principal–agent problems. Governments rely on utilities to supply electricity, regulators to enforce tariffs, and private companies to invest in generation. However, agents often pursue their own agendas: utilities may underreport revenues, political elites may capture regulators, and private companies may neglect service quality. The result is a persistent "performance gap" between policy goals and outcomes (Eberhard & Gratwick, 2021).

Application to Sierra Leone**,** principal–agent problems are evident at multiple levels:

i. The government, as principal, tasks EDSA with distributing electricity. However, EDSA often fails to meet targets due to inefficiencies, revenue leakage, and corruption. Without adequate monitoring or sanctions, the government struggles to ensure compliance.

ii. The EWRC is mandated to regulate tariffs and service standards, but is often subject to political influence. This weakens its ability to enforce rules, allowing utilities and private operators to escape accountability.

iii. International donors finance a significant portion of Sierra Leone's energy infrastructure. As principals, they impose conditions, but once projects are implemented, local agents often divert resources or fail to maintain systems. This dynamic explains why many donor-funded rural mini-grids become unsustainable after initial funding ends.

Comparative African Insights, the principal - agent challenges are not unique to Sierra Leone. In Nigeria, distribution companies often underreport their revenues to regulators, thereby exacerbating sectoral losses. In Kenya, however, improved monitoring systems and customer feedback mechanisms have reduced information asymmetries, strengthening accountability (World Bank, 2023). Sierra Leone could draw lessons from Kenya by investing in digital metering, transparent reporting, and consumer engagement to mitigate principal–agent dilemmas.

The strength of principal–agent theory lies in its clarity: it identifies information asymmetries and incentive misalignments as the root causes of poor performance. However, critics argue that it overemphasises rational self-interest and neglects cultural, historical, and institutional contexts (Peters, 2022). In Sierra Leone, weak institutions and entrenched patronage networks complicate the principal–agent dynamic, making simplistic solutions inadequate.

Good Governance and New Institutionalism

The concept of good governance gained prominence in the 1990s as international institutions linked governance reforms to development outcomes. Good governance is characterised by transparency, accountability, participation, rule of law, and effectiveness (UNDP, 2022). New institutionalism builds on this by recognising that institutions are not just formal rules but also networks of norms, practices, and power relations that shape governance outcomes (Peters, 2022).

In the energy sector, good governance means that policies are formulated transparently, decisions are accountable, citizens participate in consultations, and institutions operate effectively. Without these qualities, policies may be captured by elites, exclude vulnerable groups, or collapse due to a lack of legitimacy. For example, tariff reforms often fail if governments do not communicate transparently or engage stakeholders, leading to resistance and reversals (Meadowcroft & Florini, 2021).

Sierra Leone's energy governance faces significant governance challenges. Decision-making is often opaque, with limited consultation of citizens or civil society. Corruption and political interference undermine accountability, while weak institutional capacity limits the effectiveness of these efforts. For example, tariff

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adjustments are frequently politicised, with governments reluctant to raise prices even when necessary for cost recovery. This undermines the financial viability of utilities like EDSA.

Nevertheless, there are positive signs. Recent donor-supported reforms have introduced results-based financing models that tie disbursements to performance outcomes, incentivising greater accountability. Civil society organisations are increasingly demanding transparency in energy projects, while digital technologies such as prepaid meters enhance revenue collection and reduce opportunities for corruption.

In Ghana, good governance practices such as stakeholder consultations and independent regulatory oversight have strengthened public trust in energy policies (Kumi, 2021). In contrast, Nigeria's lack of transparency and regulatory capture has fuelled public mistrust, undermining reforms. Kenya's experience with public participation in rural electrification projects demonstrates how inclusive governance enhances legitimacy and sustainability. Sierra Leone can learn from these cases by embedding transparency, accountability, and participation into its energy governance frameworks.

Implications for Sierra Leone

Governance and institutional theories together reveal why Sierra Leone's energy reforms have underperformed. Institutional theory highlights the persistence of weak and fragmented institutions shaped by path dependency and external models. Principal–agent theory explains how information asymmetries and misaligned incentives undermine accountability between government, utilities, regulators, and donors. Good governance theory underscores the lack of transparency, participation, and accountability in decision-making processes.

Sierra Leone, the implication is clear: technical reforms alone will not deliver improved performance unless institutional and governance weaknesses are addressed. A hybrid model is needed that:

i. Strengthens institutions by building capacity, autonomy, and accountability in agencies like EDSA and EWRC.

ii. Reduces principal – agent problems through digital monitoring, performance-based contracts, and consumer feedback mechanisms.

iii. Enhances good governance by embedding transparency, participatory decision-making, and anti-corruption measures into energy reforms.

Such a model would align with the broader conceptual framework of this study, where policy inputs (laws, strategies, and financing) must be mediated through effective systems (institutions and governance mechanisms) to produce desired performance outcomes (access, reliability, affordability, and sustainability).

Governance and institutional theories provide essential insights into the policy–performance nexus in Sierra Leone's energy sector. Institutional theory explains how formal and informal rules shape organisational behaviour, often constraining reform. Principal–agent theory illuminates the accountability challenges between governments, regulators, utilities, and donors. Good governance and new institutionalism emphasise transparency, participation, and accountability as prerequisites for effective service delivery.

Taken together, these theories suggest that Sierra Leone's energy sector will only achieve meaningful improvements if governance and institutional reforms accompany technical and financial interventions. Strengthening institutions, aligning incentives, and embedding sound governance principles are not peripheral issues; they are central to ensuring that ambitious policies translate into real performance outcomes for citizens.

Energy Transition and Innovation Theories

The global energy landscape is undergoing a profound transformation, driven by the twin imperatives of achieving universal energy access and mitigating climate change. The transition from fossil fuels to renewable

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energy sources is no longer optional but an existential necessity. At the same time, technological innovation has accelerated the pace at which societies can adopt new energy systems, from distributed solar grids to digital smart metering. Understanding these processes requires robust theoretical frameworks, among which energy transition theories and innovation theories are central.

Energy transition theories - rooted in the socio-technical transitions and sustainability transitions literatures - explain how large-scale systemic change occurs over time, often shaped by technological, institutional, and social dynamics (Geels, 2021). Innovation theories, particularly the diffusion of innovations model, examine how new technologies spread within societies, influenced by factors such as relative Advantage, compatibility, and institutional support (Rogers, 2003; Sovacool et al., 2021). Together, these theories shed light on the pathways through which Sierra Leone can move from its current state of energy scarcity and unreliability toward a future characterised by inclusive, affordable, and sustainable energy service delivery.

This section examines the major strands of energy transition and innovation theory, as well as their application to Sierra Leone's energy sector. It begins by exploring socio-technical and sustainability transitions, before moving to innovation diffusion theory and the multi-level perspective on transitions. It then considers emerging concepts of energy justice and just transitions. Comparative insights from global and African experiences are integrated throughout, before concluding with implications for Sierra Leone.

Energy transitions are understood as shifts from one dominant energy system to another—for example, from biomass to coal, from coal to oil, and currently, from fossil fuels to renewable energy. Socio-technical transitions theory, as articulated by Geels (2021), posits that these changes are not purely technological but involve the co-evolution of technologies, institutions, markets, user practices, and cultural meanings. Transitions are therefore complex, non-linear, and often contested.

Sustainability transitions, a related strand, focus specifically on the transition toward low-carbon, resilient, and equitable energy systems that align with the Sustainable Development Goals (SDGs), particularly SDG 7 on affordable and clean energy and SDG 13 on climate action (IEA, 2023). These frameworks recognise that entrenched energy regimes - such as fossil fuel dependence - create lock-in effects, making transitions difficult. Overcoming these requires disruptive innovation, policy interventions, and social acceptance.

In Sierra Leone, the sustainability transition is in its early stages of development. The country's energy mix is dominated by biomass (wood fuel and charcoal), which accounts for more than 80 per cent of primary energy consumption (AfDB, 2023). Hydropower provides some grid-based electricity, but climate change has made the supply unreliable, while diesel generators remain costly and polluting. Renewable technologies such as solar are emerging but remain marginal. From a socio-technical perspective, the challenge is not simply introducing solar panels but building the institutional, financial, and cultural systems that enable their adoption at scale.

Comparative African Insights from **o**ther African countries illustrate transition pathways. Kenya has emerged as a global leader in geothermal and off-grid solar energy through sustained policy support, community engagement, and private-sector participation (Odarno et al., 2020). South Africa's Renewable Energy Independent Power Producer Procurement Programme (REIPPPP) illustrates how competitive procurement and robust regulatory frameworks can shift a coal-dominated system toward renewable energy (Eberhard & Gratwick, 2021). These examples suggest that Sierra Leone's transition must be systemic, involving reforms across governance, finance, and societal acceptance.

Innovation Diffusion Theory

Everett Rogers' *Diffusion of Innovations* (2003) remains a foundational framework for understanding how new technologies spread within societies. Rogers identifies five factors that influence adoption:

i. Relative Advantage – the degree to which an innovation is perceived as better than existing alternatives.

ii. Compatibility – alignment with cultural values, experiences, and needs.

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iii. Complexity – ease of understanding and use.

iv. Trialability – the ability to experiment with the innovation before full adoption.

v. Observability – visibility of results to others.

Diffusion occurs through categories of adopters, innovators, early adopters, early majority, late majority, and laggards, shaped by communication channels, social systems, and change agents.

In the energy sector, diffusion theory explains why some technologies, such as mobile solar lanterns, spread rapidly in African villages, while others, like biogas digesters, struggle. Innovations succeed when they provide clear advantages, fit local contexts, are easy to use, and are supported by trusted intermediaries (Sovacool et al., 2021).

In Sierra Leone, diffusion theory helps explain the uneven uptake of renewable energy technologies. Solar lanterns and home systems have spread relatively quickly in rural communities because they offer clear advantages (lighting, phone charging), are compatible with off-grid lifestyles, and are easy to use. By contrast, larger solar mini-grids have faced resistance due to high tariffs, limited community engagement, and perceived complexity, with adoption stalling without effective change agents, such as local councils or NGOs.

Ghana's adoption of prepaid metering demonstrates how innovations can diffuse rapidly when they meet consumer needs (affordable, transparent billing) and are supported by strong institutions (PURC). In contrast, Nigeria's attempt to introduce smart meters has faced delays due to consumer mistrust and weak regulatory enforcement (World Bank, 2023). Sierra Leone, building trust and demonstrating clear benefits will be crucial for diffusing innovations such as smart grids and digital payment systems.

The Multi-Level Perspective (MLP), pioneered by Geels, is a widely applied framework for analysing sustainability transitions (Geels, 2021). It conceptualises transitions as interactions across three levels:

i. Niches – protected spaces where radical innovations emerge.

ii. Regimes – dominant systems that stabilise existing practices, technologies, and institutions.

iii. Landscapes – broader exogenous factors such as climate change, global markets, or political upheavals.

Transitions occur when niche innovations gain momentum, landscape pressures destabilise regimes, and windows of opportunity open for change.

In the energy sector, solar mini-grids and home systems can be viewed as niche innovations. National utilities and fossil-fuel-based systems represent the regime, while climate change and international financing shape the landscape. The pace and direction of transition depend on how these levels interact.

In Sierra Leone, solar entrepreneurs and donor-supported mini-grids are niche innovations. EDSA and reliance on biomass and hydropower dominate the regime. The landscape is shaped by climate change (which reduces hydropower reliability), rising fuel prices, and international pressure for decarbonisation. The MLP suggests that if landscape pressures intensify and niche innovations mature, the fossil-biomass regime could be destabilised, opening pathways for renewables. However, without institutional support, niches risk remaining isolated experiments.

Kenya exemplifies successful niche-to-regime shifts: off-grid solar, once a marginal technology, has become mainstream due to policy support, private investment, and consumer acceptance. In South Africa, landscape pressures (climate change, Eskom's crisis) are creating space for renewable niches to challenge the coal regime. For Sierra Leone, international climate finance and donor support may exert landscape pressures, but stronger domestic policies are needed to scale up niche areas.

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Energy transitions are not only technical but also social and political. The concept of energy justice emphasises fairness in the distribution of energy benefits and burdens, recognition of marginalised groups, and participation in decision-making (Jenkins et al., 2021). The related notion of a just transition stresses that shifts away from fossil fuels must not leave workers, communities, or vulnerable groups behind.

In Sierra Leone, equity considerations are paramount. Urban elites often enjoy access to subsidised electricity, while rural communities remain off-grid. Women and children bear the burden of biomass dependence through health impacts and time spent collecting firewood. Energy justice frameworks demand that reforms prioritise these groups, ensuring that transitions are inclusive.

South Africa's coal-dependent regions underscore the challenge of achieving just transitions: transitioning to renewables must involve retraining workers and supporting affected communities. In contrast, Kenya's renewable expansion has created new jobs in solar entrepreneurship, demonstrating positive justice outcomes (Meadowcroft & Florini, 2021). For Sierra Leone, ensuring that rural communities, women, and youth benefit equitably from renewable investments is essential for legitimacy and sustainability.

Global experiences demonstrate that transitions require sustained, long-term policy support. Germany's *Energiewende* exemplifies how sustained subsidies, regulatory frameworks, and social acceptance can collectively shift a system toward renewable energy sources (Sovacool & Griffiths, 2020). China demonstrates how state-led innovation and scaling can rapidly transform energy systems.

In Africa, Kenya and South Africa are leading the way, while Ghana has made significant progress through hydropower and distributed renewables. Nigeria illustrates the pitfalls of weak institutions, where reforms are repeatedly announced but poorly implemented. Sierra Leone's experience more closely mirrors Nigeria's, but with lessons to learn from Kenya's decentralisation and South Africa's hybrid procurement models.

Energy transition and innovation theories provide critical lessons for Sierra Leone:

1. Transitions are systemic – Introducing renewables requires institutional, financial, and cultural reforms, not just technology.

2. Diffusion requires trust – Innovations must demonstrate clear benefits, align with local needs, and be supported by credible intermediaries.

3. Niches must scale – Donor-funded mini-grids and pilot projects must be mainstreamed into national planning, supported by tariffs, financing, and regulation.

4. Justice is essential – Transitions must prioritise rural, poor, and marginalised groups to ensure legitimacy.

5. Global–local alignment – Sierra Leone must leverage international climate finance and regional frameworks (ECOWAS, WAPP) while building domestic ownership.

Energy transition and innovation theories illuminate the pathways and challenges of moving from unsustainable regimes toward renewable, equitable, and resilient energy systems. The socio-technical and sustainability transitions perspectives emphasise systemic change; diffusion theory explains adoption dynamics; the multi-level perspective highlights interactions between niches, regimes, and landscapes; and energy justice underscores inclusivity. For Sierra Leone, these theories collectively suggest that achieving universal access and sustainable service delivery will require more than importing technologies. It will demand systemic reforms, institutional support, cultural change, and inclusive governance that ensures no one is left behind.

Synthesis of the Theoretical Review

The theoretical review in this chapter has examined three significant theoretical strands—policy implementation, governance and institutional perspectives, and energy transition and innovation frameworks to

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interrogate the policy–performance nexus in Sierra Leone's energy sector. Each theoretical lens provides distinctive insights, but when taken together, they illuminate the structural, political, and systemic dynamics that explain the persistent gap between policy ambition and service delivery outcomes.

Policy implementation theories emphasise the mechanics of translating policy into practice. The top-down model explains Sierra Leone's tendency to adopt ambitious energy policies and reforms designed at the national or donor level, such as the Electricity Act (2011) and the NEAP (2015). These reforms demonstrate vision and commitment but often falter in execution due to limited capacity, resource shortages, and political interference. The bottom-up perspective emphasises the role of local actors, NGOs, and communities in sustaining initiatives, such as mini-grids, under the Rural Renewable Energy Project. Nevertheless, this approach struggles with scale and uniformity. The policy cycle framework emphasises the importance of iterative learning; however, Sierra Leone's cycles frequently stall at the implementation and evaluation stages.

Governance and institutional theories move the analysis from processes to structures. Institutional theory explains how path dependency and institutional isomorphism have produced utilities and regulators that mirror global models but lack the capacity to enforce reforms effectively. Principal–agent theory highlights accountability failures between governments, regulators, utilities, and donors, where information asymmetries allow agents to shirk their responsibilities without consequence. Good governance frameworks underscore deficits in transparency, participation, and accountability, which erode legitimacy and weaken reform. Comparative cases, such as Ghana's independent PURC and Kenya's use of digital monitoring, illustrate that governance quality, not merely policy design, determines performance.

Energy transition and innovation theories extend the analysis to the dynamics of systemic change. Socio-technical transitions theory explains why Sierra Leone remains locked in a biomass-dominated regime, despite niche innovations such as donor-funded mini-grids. The diffusion of innovations theory clarifies why some technologies, such as solar lanterns, spread rapidly, while others, like community mini-grids, face resistance. The multi-level perspective (MLP) situates Sierra Leone at a crossroads, where landscape pressures (climate change, fuel volatility, global decarbonisation) could destabilise entrenched regimes if niche innovations are scaled. Finally, energy justice reminds us that transitions must be inclusive, addressing rural–urban disparities and gendered burdens of energy poverty.

The thesis emerging from these theories is that effective energy service delivery in Sierra Leone requires structured, well-designed policies, strong institutions, and systemic innovation pathways. In this view, ambitious reforms such as the NEAP or donor-supported projects are fundamentally sound; what is needed is better Implementation, stronger governance, and scaling of innovations.

The antithesis**,** however, is that policy ambition alone is insufficient in a context marked by weak institutions, entrenched informal practices, and deep inequities. Even technically sound reforms may collapse under the weight of institutional fragmentation, political patronage, and social exclusion. Transition theories further caution that innovation without justice can reproduce inequalities, benefiting urban elites while rural populations remain energy poor.

The synthesis, therefore, is that Sierra Leone’s energy sector requires a hybrid governance and implementation model that combines central leadership with bottom-up participation, embeds sound governance principles into institutional reform, and supports systemic energy transitions that are both technologically viable and socially just. The theoretical review highlights that energy reform is not merely a technical challenge but a multidimensional process that demands coherence across policy design, institutional frameworks, and innovation systems.

By articulating the intersections of these theories, this study is positioned to explore in the next chapter how empirical evidence from Sierra Leone’s energy sector reflects these dynamics. The empirical review (Chapter 2.4) will provide comparative global, regional, and national experiences that further test and refine the arguments presented here.

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Empirical Review

Empirical evidence provides the practical grounding necessary to complement the theoretical insights explored in the previous section. While theory identifies the structures and dynamics that influence policy outcomes, empirical research demonstrates how these dynamics play out in practice across various contexts. For the energy sector, such evidence is significant because it highlights the successes and failures of reforms, innovations, and governance arrangements in delivering reliable, affordable, and sustainable electricity.

This empirical review is organised into four levels - global experiences**,** African perspectives**,** West African benchmarks**,** and the Sierra Leonean context. The aim is to situate Sierra Leone within broader patterns, identifying lessons, best practices, and contextual challenges that can inform a new framework for service delivery.

Global Experiences

Globally, empirical evidence shows that successful energy reform requires policy coherence, institutional strength, and sustained investment. In developed economies, the energy transition has been facilitated by long-term planning, consistent regulatory frameworks, and strong public–private partnerships.

Europe's Energy Transitions, Germany's *Energiewende* exemplifies how consistent subsidies, regulatory clarity, and public support can drive rapid adoption of renewable energy. Between 2000 and 2020, renewable electricity increased from under 10% to over 45% of the supply, supported by feed-in tariffs and grid investments (Sovacool & Griffiths, 2020). Empirical evaluations, however, show that challenges persist in terms of cost distribution and grid stability, highlighting the need for continuous adaptation (Geels, 2021).

Asia's Renewable Expansion, China's renewable energy boom illustrates the role of state-led innovation and scale. By 2023, China accounted for nearly half of global renewable additions, facilitated by central planning, technology investment, and supply chain integration (IEA, 2023). India's experience demonstrates the importance of decentralised solar: the *Saubhagya Scheme* electrified over 26 million households between 2017 and 2019, combining central funding with state-level delivery (World Bank, 2023).

Latin America's Hydropower Dependence, Empirical studies of Brazil and Chile highlight both the potential and vulnerabilities of hydropower. Brazil derives over 60 per cent of its electricity from hydropower, but droughts have repeatedly disrupted the supply, prompting diversification into wind and solar energy (Pereira et al., 2022).

Global Lessons, these experiences highlight three empirical lessons: (1) policy coherence and regulatory stability are critical for investor confidence; (2) transitions require a balance of central leadership and local adaptation; and (3) overdependence on single technologies, such as hydropower, creates vulnerabilities that must be addressed through diversification.

African Perspectives

In Africa, empirical evidence reflects both persistent energy poverty and innovative reforms. Over 600 million Africans lack electricity, and nearly 900 million rely on traditional biomass (AfDB, 2023). However, countries such as Kenya, South Africa, and Morocco provide models of progress.

In Kenya, off-grid Solar Success - Empirical studies show that Kenya has become a leader in decentralised renewables. Over 30 percent of households utilise solar home systems, which are supported by private companies and microfinancing (Odarno et al., 2020). The government's Last Mile Connectivity Project expanded grid access, while the private sector drove off-grid solutions. This demonstrates how bottom-up adoption can complement national electrification goals.

In South Africa, Renewable IPPs, South Africa's *Renewable Energy Independent Power Producer Procurement Programme (REIPPPP)* has attracted over $15 billion in private investment, adding 6 GW of renewable capacity (Eberhard & Gratwick, 2021). Empirical evaluations highlight the success of competitive

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bidding, transparent regulation, and community benefit schemes. Nevertheless, challenges remain due to Eskom's monopoly and political resistance.

In Morocco, Solar Megaprojects, Morocco's *Noor Ouarzazate Solar Complex* is one of the largest in the world, demonstrating how state-led investment, international finance, and public support can drive the expansion of renewable energy. Empirical data indicate that Morocco has diversified its energy mix, thereby reducing its reliance on imports and enhancing resilience (IEA, 2023).

Nigeria Persistent Challenges, despite reform efforts, Nigeria illustrates the pitfalls of weak Implementation and governance. Studies show that distribution companies underreport revenues, theft is rampant, and regulatory capture undermines reforms. As of 2023, over 80 million Nigerians still lacked access to electricity (World Bank, 2023).

Empirical Lessons for Africa - Across the continent, empirical evidence highlights that progress is possible but contingent on governance quality, financial innovation, and the integration of centralised and decentralised solutions.

West African Benchmarks

Within West Africa, empirical studies highlight both best practices and cautionary tales that are highly relevant for Sierra Leone.

In Ghana, Consistent Electrification Progress - Ghana's National Electrification Scheme, launched in 1989, has increased access rates to over 80 per cent (Kumi, 2021). Empirical evaluations show that success was achieved through grid expansion, rural electrification programmes, and consistent donor support. Importantly, Ghana's **Public Utilities Regulatory Commission (PURC)** provided regulatory stability, ensuring that tariffs were both cost-reflective and socially sensitive.

Côte d'Ivoire's Hydropower Stability - Côte d'Ivoire has achieved near-universal electricity access, primarily through investments in hydropower and the development of robust institutional frameworks. Empirical studies indicate that the stability of its energy sector has contributed to industrial growth and regional electricity exports (AfDB, 2023).

Senegal, Scaling Renewable - Senegal's *Plan Sénégal Émergent* has expanded solar and wind, with empirical evidence showing significant rural electrification gains supported by PPPs and donor finance (IEA, 2023).

Liberia and Guinea: Fragile Contexts - Like Sierra Leone, these countries struggle with fragile institutions, high dependence on donor finance, and low access rates. Empirical studies indicate that while hydropower projects, such as the Mount Coffee plant in Liberia, have improved supply, sustainability is compromised by governance and financial deficits (World Bank, 2023).

Regional Integration through ECOWAS - The West African Power Pool (WAPP) illustrates efforts at regional integration. Empirical evidence suggests that cross-border trade has improved supply reliability in some contexts but remains constrained by weak infrastructure and regulatory misalignment (ECOWAS, 2022).

Empirical Lessons for West Africa - Benchmarks show that consistent policy direction (Ghana), stable institutions (Côte d'Ivoire), and renewable scaling (Senegal) are essential, while fragile states like Liberia and Sierra Leone struggle due to governance deficits.

Sierra Leone's Energy Sector

Empirical data highlight Sierra Leone's persistent energy crisis. Less than 30 per cent of the population has access to electricity, with rural access rates below 10 per cent (World Bank, 2023). Biomass accounts for over 80 per cent of primary energy use, reflecting a high dependence on wood fuel and charcoal (AfDB, 2023). The grid is limited, fragmented, and unreliable, with frequent outages in Freetown and minimal rural coverage.

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The Electricity Act of 2011, NEAP (2015), and NREAP (2016) provide a framework for reform. However, empirical evidence shows weak Implementation. EDSA continues to record losses exceeding 40 per cent due to technical inefficiencies, unauthorised connections, and billing challenges. Tariff reforms are undermined by political interference, while regulatory bodies such as the EWRC lack enforcement power (AfDB, 2023).

Donor projects, such as the Rural Renewable Energy Project (RREP), have achieved some success by deploying mini-grids in rural areas. Empirical studies indicate that communities with local ownership and training are more likely to sustain these systems effectively than those without (UNDP, 2022). However, sustainability remains uncertain once donor funding ends.

Sierra Leone has significant renewable energy potential, particularly in solar and small hydroelectric sources. Empirical assessments estimate that tapping even a fraction of this potential could transform access rates (IEA, 2023). However, barriers include financing gaps, weak institutional structures, and limited technical capacity.

Empirical evidence highlights stark inequities. Urban elites enjoy subsidised electricity, while rural populations remain excluded. Women and children bear the burden of biomass dependence, with severe health impacts. Without equity-focused policies, reforms risk entrenching inequality rather than alleviating it (Jenkins et al., 2021).

Empirical reviews consistently highlight the gap between policy ambition and outcomes. Targets set under NEAP and NREAP remain far from realised. Monitoring and evaluation mechanisms are weak, with limited data collection and feedback loops. As a result, policies are often disconnected from the realities on the ground.

The empirical review across global, African, West African, and Sierra Leonean contexts highlights a consistent pattern: successful energy reform requires coherence, capacity, and inclusivity**.** Globally, countries that sustain long-term policy direction and strike a balance between central leadership and local adaptation achieve significant progress. In Africa, Kenya, South Africa, and Morocco demonstrate that innovation and governance can overcome resource constraints. In West Africa, Ghana and Côte d'Ivoire serve as benchmarks, while Liberia and Sierra Leone illustrate the challenges of fragile states.

Sierra Leone, the empirical evidence reveals both persistent challenges and opportunities. While ambitious policies and donor support exist, weak institutions, governance deficits, and inequities undermine performance. Lessons from regional and global benchmarks suggest that Sierra Leone must strengthen governance, embed equity, and harness renewable innovation to close the gap between policy ambition and service delivery.

Synthesis and Knowledge Gaps of the Literature Review

The literature reviewed in the preceding sections has provided conceptual, theoretical, and empirical insights into the policy–performance nexus in energy service delivery. Collectively, these works highlight the promise of ambitious reforms, governance innovation, and energy transitions. However, they also reveal the persistent failures of fragile states such as Sierra Leone to convert policy intent into tangible outcomes. A synthesis of the literature demonstrates areas of convergence where scholars broadly agree, points of divergence where debates persist, and significant knowledge gaps that justify this study.

Across the literature, scholars converge on the idea that energy is a fundamental driver of socio-economic development. Reliable and affordable electricity underpins industrial growth, human capital development, and poverty reduction (World Bank, 2023; AfDB, 2023). There is also broad agreement that policy ambition alone is insufficient; performance outcomes are shaped by governance quality, institutional capacity, and financing mechanisms. Another area of consensus is the recognition that energy transitions are systemic. Scholars highlight that transitions involve technological, institutional, and cultural change, not merely the introduction of new hardware (Geels, 2021; Meadowcroft & Florini, 2021). Theories of innovation diffusion and multi-level perspectives converge in underscoring the importance of scaling niche innovations, embedding justice considerations, and aligning local adoption with global pressures. Finally, there is convergence on the need for inclusive and equitable reforms. Studies emphasise that energy policies must address rural–urban disparities

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and gender inequalities, ensuring that vulnerable groups benefit rather than being left behind (Jenkins et al., 2021; UNDP, 2022).

First, scholars disagree on the relative effectiveness of top-down versus bottom-up implementation approaches. Pressman and Wildavsky (2020) and Matland (2021) argue that clarity of objectives and central coordination are decisive, particularly in resource-scarce settings. By contrast, Lipsky (2020) and Sabatier (2021) highlight the discretion of local actors, emphasising that policy outcomes are determined mainly "on the ground." This divergence is particularly relevant in Sierra Leone, where top-down reforms, such as the NEAP, clash with bottom-up community electrification projects. Second, there are debates over the transferability of governance models. Institutional theorists argue that global reform templates, such as unbundling utilities, often produce isomorphic structures without addressing local path dependencies (DiMaggio & Powell, 2020). Others contend that adopting international best practices can strengthen fragile states by aligning them with global norms (Peters, 2022). This divergence explains why reforms in Sierra Leone, which mirror international models, fail to achieve comparable outcomes. Third, scholars diverge on the pace and equity of energy transitions. Some argue that rapid scaling of renewables is feasible with sufficient financing and regulatory support (IEA, 2023; Sovacool et al., 2021). Others caution that without attention to justice and inclusivity, transitions may exacerbate inequalities, privileging urban elites while rural populations remain dependent on biomass (Jenkins et al., 2021).

The synthesis of convergence and divergence reveals several critical gaps in the literature that this study will address:

1. Policy–Performance Disconnect in Fragile States - while global literature highlights the importance of policy coherence, little is known about why fragile states, such as Sierra Leone, repeatedly fail to translate ambitious reforms into tangible outcomes.

2. Governance under Institutional Weakness - research on regulatory independence and good governance is well-developed in stronger economies but sparse in fragile contexts where political interference and weak capacity dominate.

3. Sustainability of Donor-Funded Interventions - although donor projects expand access in the short term, their long-term sustainability in fragile states remains underexplored, particularly in terms of community ownership and financial viability.

4. Equity and Justice Dimensions in Fragile Contexts - the global literature on just transitions is expanding, but its application in countries like Sierra Leone remains limited, particularly in terms of gender, rural–urban disparities, and social exclusion.

5. Integration of Hybrid Models - theories often treat top-down, bottom-up, governance, and transition approaches separately. There is a lack of integrated frameworks that synthesise these insights for fragile states where multiple pressures coexist.

The literature demonstrates both convergence and divergence on the determinants of effective energy service delivery. Scholars agree that policy ambition, governance quality, and systemic transitions are critical; however, they diverge on the relative importance of central control, local discretion, and the transferability of global models. More importantly, significant gaps remain in understanding how fragile states, such as Sierra Leone, can bridge the persistent policy–performance disconnect. Addressing these gaps—through an integrated, hybrid framework that embeds governance reform, innovation scaling, and equity—constitutes the central contribution of this study.

Summary of Chapter Two

This chapter reviewed the conceptual, theoretical, and empirical literature underpinning the study of the policy–performance nexus in Sierra Leone’s energy sector. The conceptual review clarified core constructs, policy, performance, systems, and the nexus between them, while introducing the study’s conceptual framework that links policy inputs, systemic variables, and performance outcomes.

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The theoretical review examined three strands of scholarship. Policy implementation theories highlighted the limitations of top-down reforms in fragile contexts, the promise and challenges of bottom-up participation, and the weaknesses of Sierra Leone's policy cycle in generating feedback for iterative learning. Governance and institutional theories explain how institutional path dependency, principal–agent problems, and weak accountability mechanisms undermine reform efforts. In contrast, comparative evidence from Ghana, Kenya, and South Africa demonstrates how regulatory independence and good governance can strengthen performance. Energy transition and innovation theories situated Sierra Leone within broader global and regional dynamics, underscoring that transitions are socio-technical processes requiring systemic change, that innovation diffusion depends on trust and local adaptation, and that equity and justice must be central to reform efforts.

The empirical review contextualised these theories by drawing on global, African, West African, and Sierra Leonean experiences. It revealed that while global cases, such as those in Germany and China, demonstrate how consistent policy and investment drive transitions, African leaders, like those in Kenya and Morocco, show that innovation and strong governance can overcome resource constraints. Within West Africa, Ghana and Côte d'Ivoire serve as benchmarks for consistent electrification and institutional stability. In contrast, fragile states like Liberia and Sierra Leone continue to struggle with weak capacity and governance deficits.

The synthesis highlighted convergence among scholars on the need for coherent policies, strong governance, and systemic innovation, but divergence on the relative weight of top-down versus bottom-up approaches and the transferability of global models to fragile contexts. Key knowledge gaps include the policy–performance disconnect in fragile states, the sustainability of donor-funded projects, and the integration of equity and justice into reforms.

Overall, the chapter established that Sierra Leone's energy sector is characterised by persistent ambition–performance gaps, fragile institutions, and inequities in access. Addressing these requires a hybrid framework that integrates policy ambition with governance reform, community participation, systemic innovation, and inclusivity. This sets the stage for Chapter Three, which outlines the methodology for empirically investigating these dynamics.

METHODOLOGY

Introduction

Every research project rests on a methodological foundation that gives credibility to its findings and provides assurance that the conclusions drawn are both reliable and valid. For this study, which explores the policy–performance nexus in Sierra Leone's energy sector, methodology is particularly critical. The sector itself is marked by complexity, as energy supply involves multiple actors, including government ministries and regulatory agencies, international donors, private operators, and end-users. Policies are ambitious and frequently align with international best practices, yet performance outcomes remain modest, with low access rates and persistent system failures.

Understanding why this gap exists requires a research design that captures both quantitative performance data and qualitative insights into governance, institutions, and lived experiences.

The purpose of this chapter is therefore to explain how the research was designed to meet the objectives of the study, answer the research questions, and address the problem statement. It begins by discussing the choice of research design and philosophical orientation, before turning to the population and sampling approach, the data collection instruments, and the techniques of Analysis. The chapter also addresses issues of validity, reliability, trustworthiness, and ethics, and concludes with a reflection on the limitations of the chosen methodology.

Research Design

The study adopts a mixed-methods design, specifically a convergent parallel strategy. The choice is deliberate. Energy policy research is not purely a matter of numbers or purely a matter of narratives, it is both. On one

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hand, there are tangible performance indicators such as electricity access rates, affordability, frequency of outages, revenue collection, and non-technical losses. On the other hand, there are equally important issues of governance, institutional behaviour, and the perceptions of households and communities about service delivery. A design that can integrate these two strands of evidence is therefore the most appropriate.

Mixed methods have been described by Creswell and Plano Clark (2018) as particularly suitable when neither quantitative nor qualitative approaches alone can adequately capture a complex phenomenon. By employing a convergent parallel design, this study collects both quantitative and qualitative data simultaneously, analyses them separately, and then integrates the results during interpretation. This approach enables the identification of points of convergence, complementarity, and divergence. For instance, if survey results indicate widespread dissatisfaction with tariffs, qualitative interviews may reveal the governance or communication failures underlying this sentiment.

The strength of this design lies in its ability to strike a balance between breadth and depth. Quantitative surveys provide generalisable trends across households, while interviews and focus groups offer rich, contextual insights from policymakers, regulators, utility staff, and consumers. The main limitation of the design is its demand on time, resources, and the researcher's capacity to work across different methodological traditions. Though, given the study's objectives, these challenges are outweighed by the benefits of comprehensive evidence.

Research Philosophy and Paradigm

Behind every methodological choice lies a set of assumptions about how knowledge is constructed. This study is guided by pragmatism as its research paradigm. Pragmatism is particularly relevant for policy research because it focuses less on abstract philosophical debates and more on what works in practice (Morgan, 2020). It enables the researcher to leverage the strengths of both positivist traditions (with their emphasis on measurement and objectivity) and interpretivist traditions (with their emphasis on meaning and context).

The central rationale for adopting pragmatism is that the research questions of this study require both objective evidence and subjective interpretation. For example, the question of how far Sierra Leone has progressed towards universal energy access is best answered through quantitative performance data.

However, the equally important question of why reforms have failed or why policies are not implemented as intended can only be answered by engaging with the perspectives of those involved in the process, policymakers, utility managers, and consumers. Pragmatism offers the flexibility to integrate these insights within a single, coherent study.

Population and Sampling

The study population comprises all stakeholders in Sierra Leone's energy sector. This includes policymakers in the Ministry of Energy and Ministry of Finance, regulators in the Electricity and Water Regulatory Commission (EWRC)**,** operators such as the Electricity Distribution and Supply Authority (EDSA) and the Electricity Generation and Transmission Company (EGTC), international development partners such as the World Bank, AfDB, and UNDP, private renewable energy firms, civil society organisations, and consumers both in urban and rural areas.

Because the study focuses on a wide range of actors, a combination of purposive sampling and stratified random sampling is employed. For the qualitative strand, purposive sampling identifies those actors who are best positioned to provide insight into energy policy and performance. Around 25–30 interviews are planned with key informants, including senior officials, donor representatives, private sector leaders, and civil society actors. Focus group discussions (FGDs) are also conducted in selected rural communities to capture collective experiences with mini-grids and solar home systems.

For the quantitative strand, a household survey targets approximately 400 households. The sample is stratified to ensure Representation from both urban centres, such as Freetown, Bo, and Kenema, and rural districts where access remains extremely low. The sample size of 400 households is derived from Krejcie and Morgan's

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formula for determining sample size, which provides a 95% confidence level with a margin of error of ±5%. Stratification ensures that rural–urban disparities, gender dynamics, and socio-economic differences are captured.

Data Sources and Collection Methods

Primary data forms the backbone of the study. These are collected through:

i. Household Surveys, which gather information on electricity access, affordability, reliability, satisfaction, coping strategies, and perceptions of government performance.

ii. Semi-structured interviews with policymakers, regulators, utility officials, donor representatives, private entrepreneurs, and civil society leaders. These interviews explore policy formulation, governance constraints, financing models, and reform challenges.

iii. Focus Group Discussions in rural communities to explore experiences with donor-funded mini-grids, willingness to pay, and the inclusivity of reforms.

Secondary data complements the primary evidence. These include national policy documents such as the Electricity Act (2011)**,** the National Electricity Access Policy (2015), and the National Renewable Energy Action Plan (2016)**.** Performance data from annual reports of EDSA and the Ministry of Energy are analysed, as well as regional and global reports from institutions such as the AfDB, IEA, UNDP, and ECOWAS. Academic journal articles, working papers, and evaluation studies provide further context and triangulation.

The combination of multiple sources ensures that the study is not reliant on a single type of data, which is particularly important in Sierra Leone, where official records are sometimes incomplete or inconsistent.

Data Analysis Methods

The Analysis proceeds in two strands: quantitative and qualitative.

Quantitative Analysis involves descriptive and inferential statistics. Descriptive statistics are used to summarise household data on access, affordability, and satisfaction. Inferential techniques, such as cross-tabulations and regression analysis, are employed to explore the relationships between policy interventions (e.g., tariff reforms) and performance outcomes (e.g., revenue collection or access rates). Benchmarking is also used to compare Sierra Leone's indicators with those of regional peers such as Ghana, Côte d'Ivoire, and Senegal.

Qualitative Analysis follows a thematic approach. Interviews and focus group transcripts are coded inductively to identify recurring themes such as governance bottlenecks, institutional weaknesses, donor dependency, and community perspectives. Thematic Analysis allows for the emergence of insights that may not have been anticipated in advance. NVivo software may be used to facilitate coding, but manual techniques are also applied to ensure familiarity with the data.

Integration of Findings occurs at the interpretation stage. Quantitative and qualitative results are compared to identify areas of convergence and divergence. For instance, if quantitative data reveal high levels of dissatisfaction with EDSA's services, qualitative interviews may provide insight into the institutional and political reasons behind that dissatisfaction. This integration enhances the robustness of the findings.

Validity, Reliability, and Trustworthiness

Ensuring validity and reliability is essential for the credibility of any study. For the quantitative strand, the survey instrument is pre-tested to refine questions and minimise ambiguity. Cronbach’s alpha is calculated to assess the internal consistency of multi-item scales, with values above 0.7 considered acceptable. Randomisation in household selection reduces sampling bias.

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For the qualitative strand, the criteria of credibility, dependability, confirmability, and transferability are applied (Lincoln & Guba, 1985; Nowell et al., 2021). Credibility is enhanced through member checking, where participants review and verify the accuracy of interview summaries. Dependability is supported by maintaining a detailed audit trail of coding and Analysis. Confirmability is addressed through reflexivity, with the researcher acknowledging personal biases and their influence on interpretation. Transferability is achieved by providing thick descriptions of the context, enabling readers to assess the applicability of findings to other fragile states.

Triangulation across multiple methods and sources enhances overall validity, ensuring that conclusions are not reliant on a single dataset alone.

Ethical Considerations

Research in sensitive sectors such as energy requires strong ethical safeguards. This study adheres to the ethical principles of respect, beneficence, and justice as outlined in the Belmont Report (U.S. DHHS, 2021). Approval will be sought from the university's research ethics committee and the national research authorities of Sierra Leone.

All participants are fully informed about the purpose of the study and their rights, and informed consent is obtained before participation. Confidentiality is guaranteed by anonymising data and storing records securely. Participation is voluntary, and respondents are free to withdraw at any time. Care is taken to avoid harm, particularly in interviews with officials where political sensitivity may be high.

Limitations of the Methodology

No methodology is without limitations. In Sierra Leone, one key limitation is the **weakness of official records**, which can constrain the reliability of secondary data. Resource constraints may also limit the number of districts that can be covered by the survey. Elite interviews carry the risk of **social desirability bias**, as respondents may underplay governance failures. Finally, logistical challenges, including transportation and power outages, may also affect data collection.

To mitigate these limitations, the study relies on triangulation, transparent documentation of procedures, and reflexivity to acknowledge potential biases. The combination of primary and secondary data also helps to compensate for gaps in official records.

Chapter Summary

This chapter has explained the methodological choices underpinning the study of the policy–performance nexus in Sierra Leone’s energy sector. A mixed-methods convergent parallel design, grounded in a pragmatist paradigm, was adopted to capture both quantitative performance indicators and qualitative perspectives. The research population comprises policymakers, regulators, utilities, donors, private sector actors, civil society organisations, and households. Data are collected through surveys, interviews, focus groups, and document analysis, and analysed using descriptive, inferential, and thematic techniques. Validity, reliability, and ethical safeguards are prioritised, while limitations are acknowledged and mitigated.

By employing this methodology, the study is well-positioned to provide a rigorous, multidimensional analysis of Sierra Leone’s energy reforms, explaining why policies often fail to translate into outcomes and how a new framework might bridge this persistent gap.

DATA PRESENTATION AND ANALYSIS

Overview

This chapter presents and analyses the findings of the study based on primary and secondary data gathered to examine the policy–performance nexus in Sierra Leone’s energy sector. The analysis is guided by the objectives set out in Chapter One, which sought to evaluate the effectiveness of policy frameworks, assess

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systemic and institutional constraints, analyse performance outcomes, explore the sustainability of donor-supported initiatives, and propose a new framework for improving service delivery.

Data collection employed a mixed-methods convergent parallel design, as described in Chapter Three. Quantitative data were collected through a household survey, yielding a 95% response rate and 380 valid questionnaires out of 400 administered. These surveys captured the perspectives of households across urban and rural districts, ensuring Representation of both grid-connected and off-grid populations. Complementing the survey**,** Key Informant Interviews (KIIs) were conducted with policymakers, regulators, utility officials, donor representatives, and private sector actors. Focus Group Discussions (FGDs) were also held in rural communities to capture collective voices.

Findings are presented thematically, organised around the research objectives, and integrate both numerical data and narrative evidence. The chapter does not merely report results but analyses their implications in light of the research questions and problem statement. The analysis reveals that, despite Sierra Leone's development of ambitious energy policies, systemic weaknesses, governance deficits, and sustainability challenges have hindered their practical implementation in service delivery.

Presentation of the Results and Findings

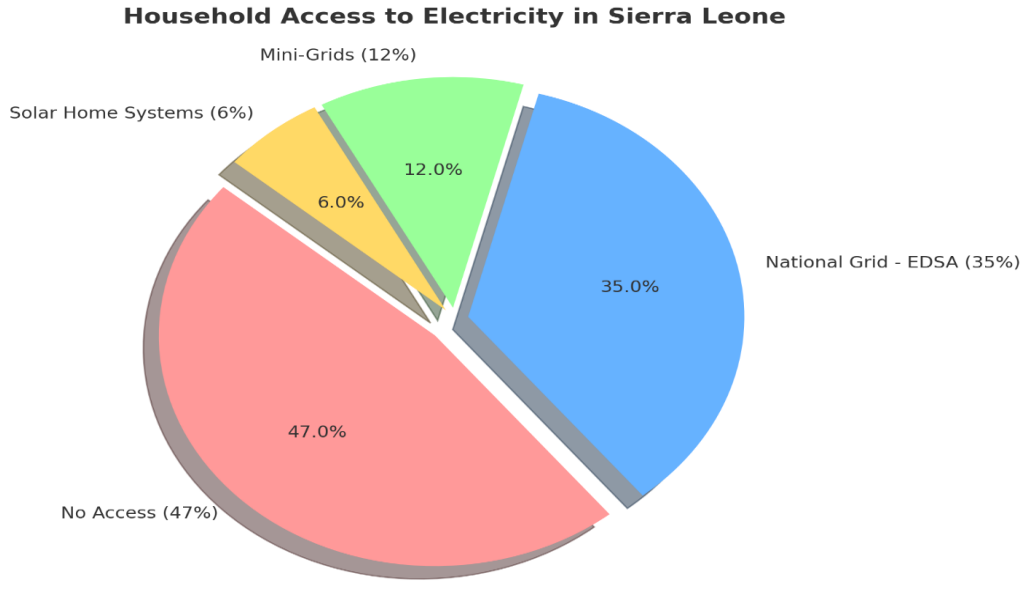
Demographic Characteristics of Respondents

Out of the 380 respondents, 52% were male and 48% female, ensuring a balanced gender Representation. The majority (41%) were aged 26–45 years**,** 29% were aged 18–25 years, 21% were aged 46–60 years, and 9% were aged 61 years or older. Educational attainment varied: 27% had no formal education, 33% had secondary education, and 28% had tertiary education**,** with the rest having only primary schooling. Occupations reflected the national structure: 35% were farmers, 26% were traders, 18% were civil servants, 12% were students, and 9% were unemployed. Household size averaged 6 members, reflecting Sierra Leone’s extended family patterns. Respondents were drawn from Freetown, Bo, Kenema, Makeni, Kono, and rural towns to ensure regional balance.

This demographic profile is significant because it situates energy demand within a context where households are large, incomes are modest, and education levels vary, influencing perceptions of Affordability, awareness of policies, and the capacity to adopt renewable technologies.

Access to Electricity

Levels of Access



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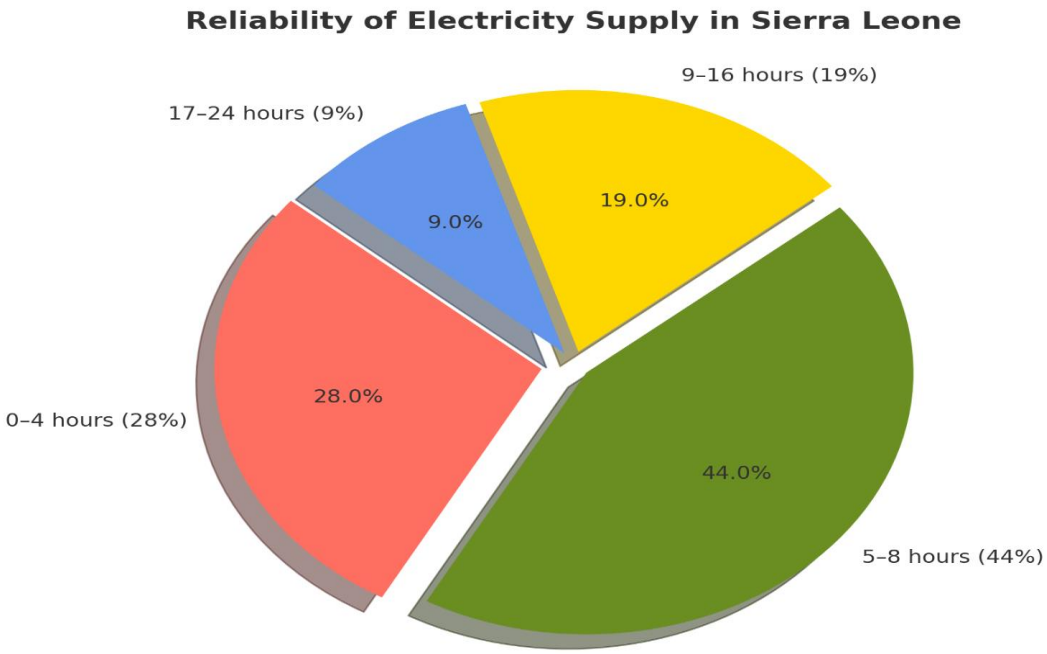
Survey findings revealed that 53% of households had some form of electricity access**,** while 47% had none. Among those connected, 35% relied on the national grid (EDSA), 12% on donor-supported mini-grids, and 6% on solar home systems.

This means nearly half of Sierra Leonean households remain excluded from modern electricity services. Rural households were disproportionately affected, with 67% lacking any connection, compared to 29% in urban centres.

Reliability of Access



The pie chart on the Reliability of electricity supply in Sierra Leone. It shows that:

i. 44% of households with Access receive only 5–8 hours of electricity daily.

ii. 28% manage just 0–4 hours, leaving them severely underserved.

iii. 19% experience 9–16 hours, while only 9% enjoy a near full-day supply.

The chart confirms that electricity access is not synonymous with Reliability. The majority of households (72%) get less than 9 hours of daily supply, while frequent blackouts (reported by 71%) worsen trust in providers. This undermines productivity, education, and welfare, creating a wide policy–performance gap.

Moreover, 71% of respondents reported experiencing more than 10 blackout days in the preceding month**,** which undermines trust in service providers. FGDs confirmed that outages often disrupted evening schooling, small business operations, and household welfare. A female trader in Bo explained:

"We pay for light, but half the time we use kerosene and candles because the current goes off."

These findings confirm that despite ambitious national access targets, the performance reality is characterised by unreliability and exclusion**,** reinforcing the policy–performance gap.

Affordability and Billing

Affordability emerged as a significant barrier to sustained energy access.

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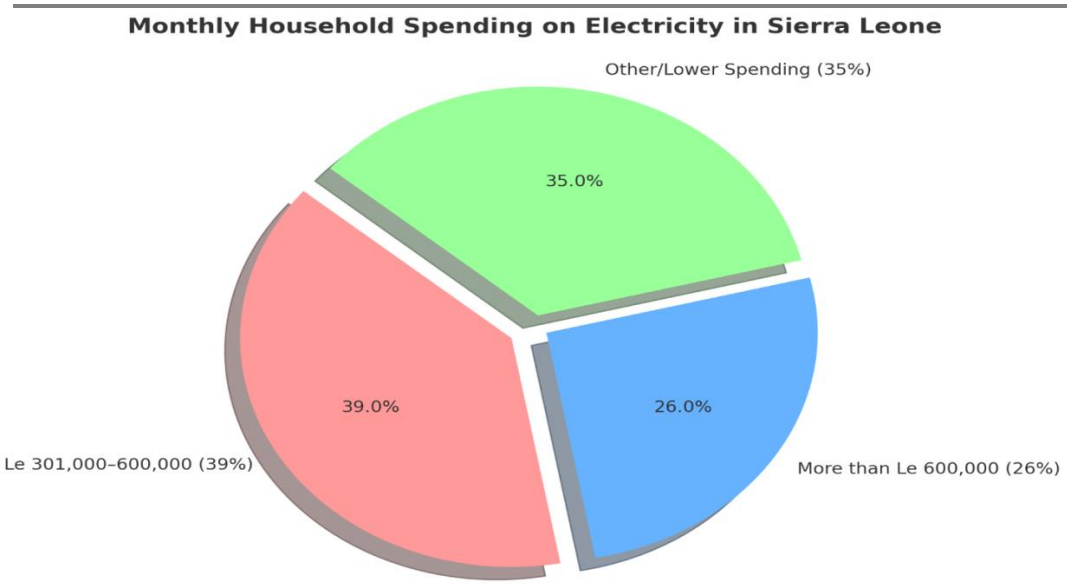

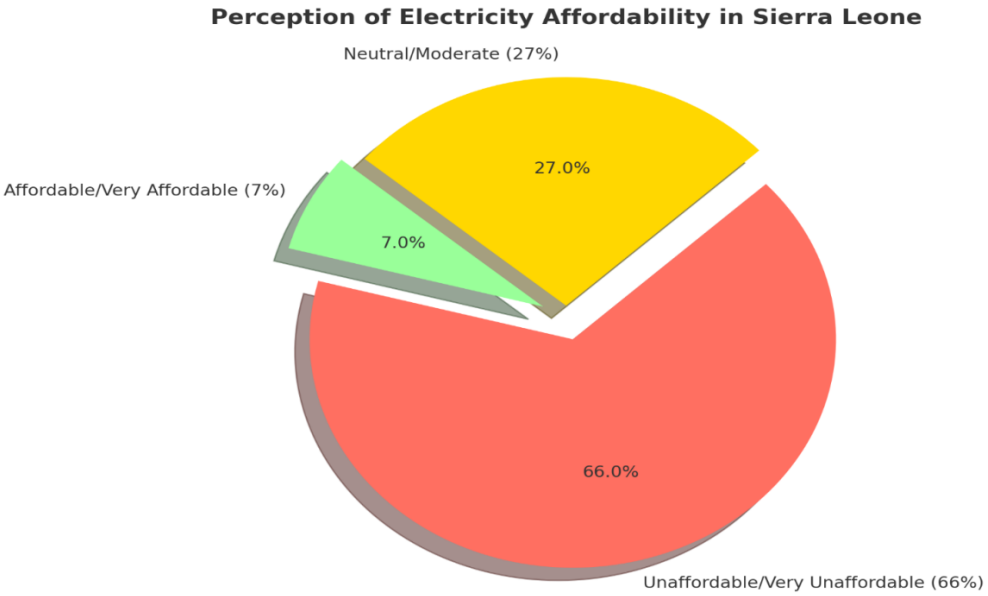

Two pie charts capturing the affordability dimension of electricity in Sierra Leone:

1. **Monthly Household Spending on Electricity**
   - 39% spend between Le 301,000 and Le 600,000 monthly, a heavy burden on average incomes.
   - 26% spend more than Le 600,000, primarily urban, business-running households.
   - 35% fall in other/lower spending brackets.
2. **Perceptions of Affordability**
   - Only 7% of households consider their bills to be affordable/very affordable.
   - A vast 66% see them as unaffordable/very unaffordable, while 27% remain neutral.

The findings highlight that Affordability is as critical a barrier as Access and Reliability. High tariffs relative to income push households- particularly in urban business hubs - into energy poverty, reinforcing inequities and weakening the sustainability of electricity provision.

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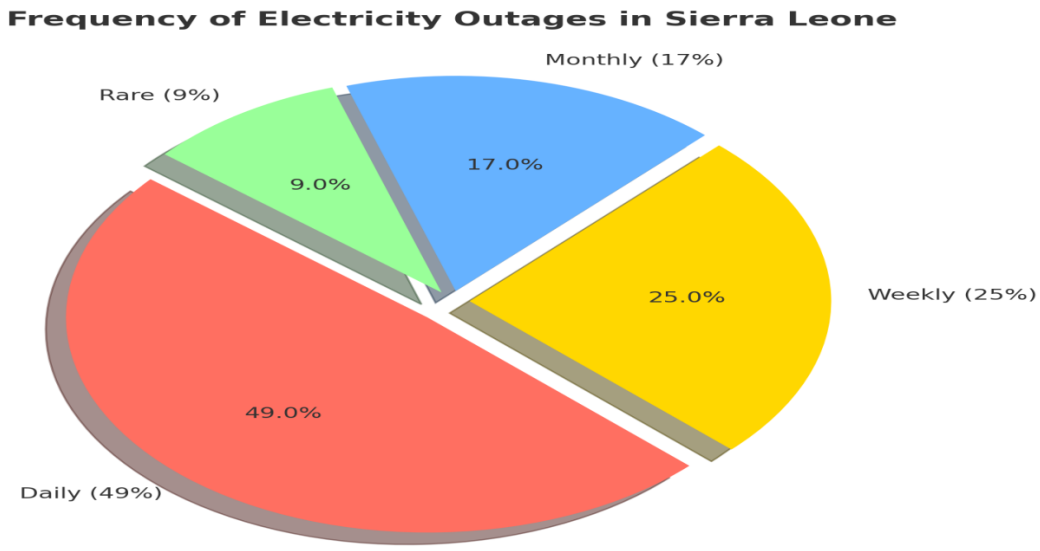
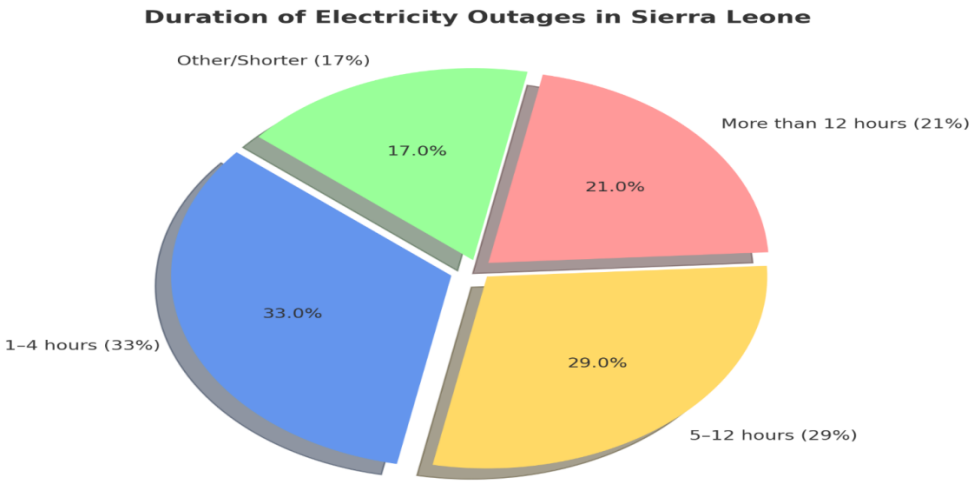
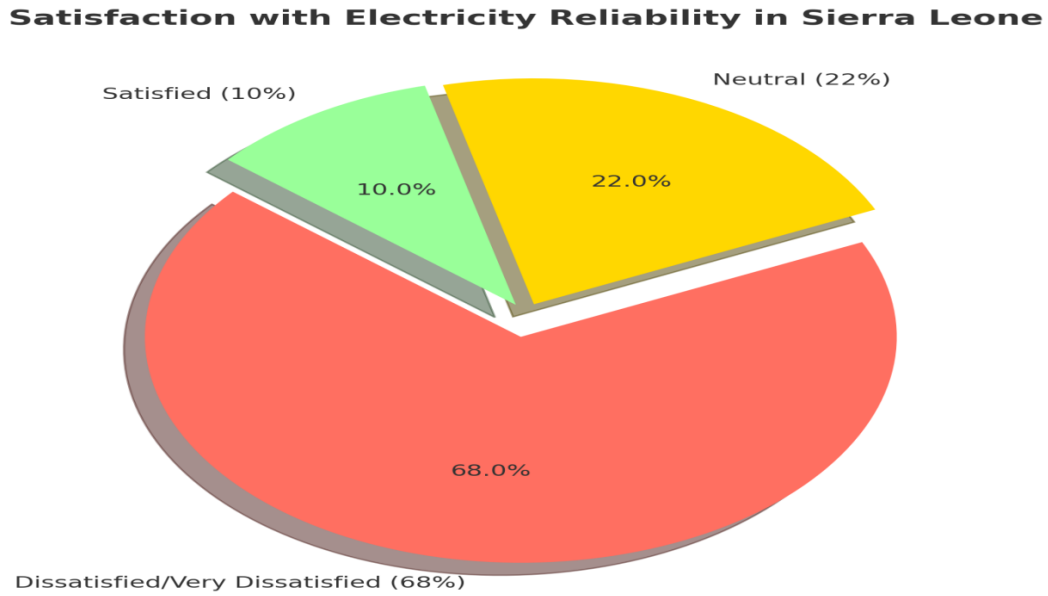
Reliability and Quality of Supply

Reliability indicators painted a worrying picture.







Three pie charts summarising Sierra Leone's reliability indicators:

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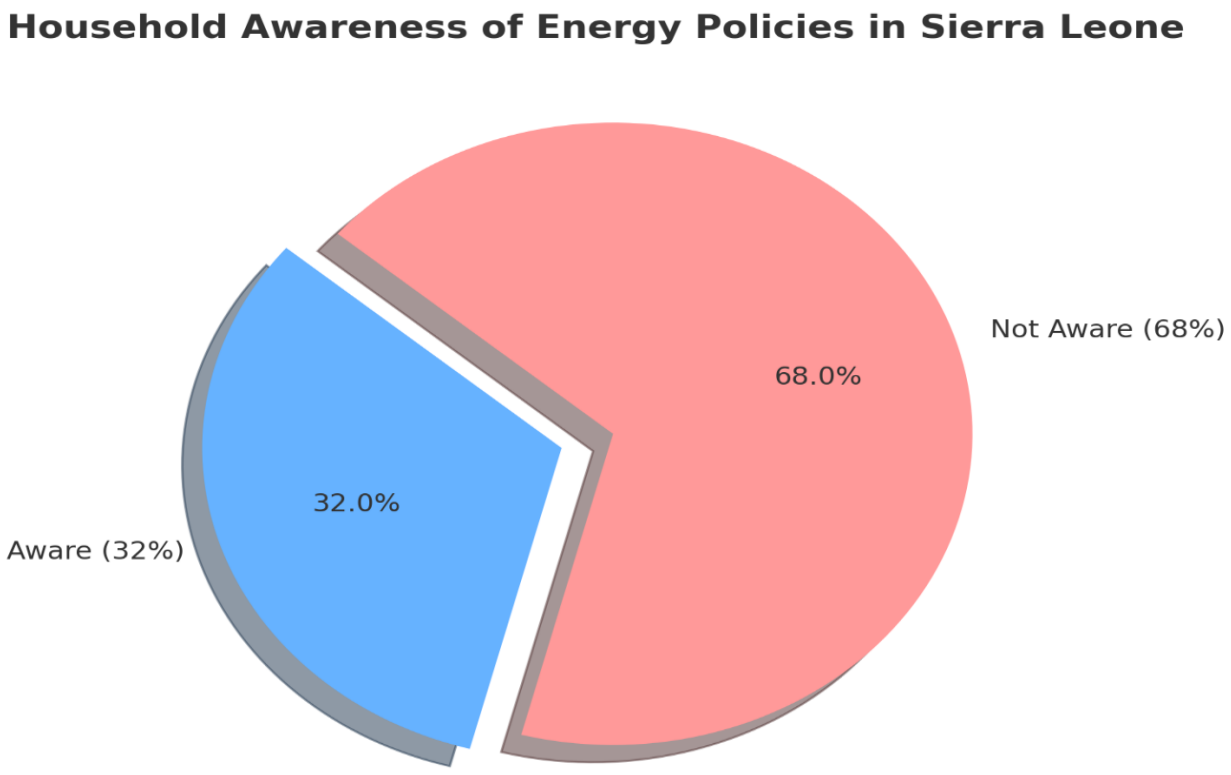
1. Frequency of Outages
   - 49% face daily outages.
   - 25% experience them weekly.
   - 17% report monthly outages, and only 9% consider them rare.
2. Duration of Outages
   - 33% last 1–4 hours,
   - 29% last 5–12 hours,
   - 21% extend beyond 12 hours.
3. Satisfaction with Reliability
   - 68% of households are dissatisfied or very dissatisfied.
   - 22% remain neutral.
   - Barely 10% are satisfied.

These charts paint a stark picture of unreliability. Electricity is not only insufficient but also unpredictable; frequent and prolonged outages undermine trust in providers, disrupt daily livelihoods, and exacerbate energy poverty. Satisfaction levels are critically low, underscoring the urgent need for policy reforms, investment in grid stability, and diversification into renewable energy sources.

Awareness and Perceptions of Policy



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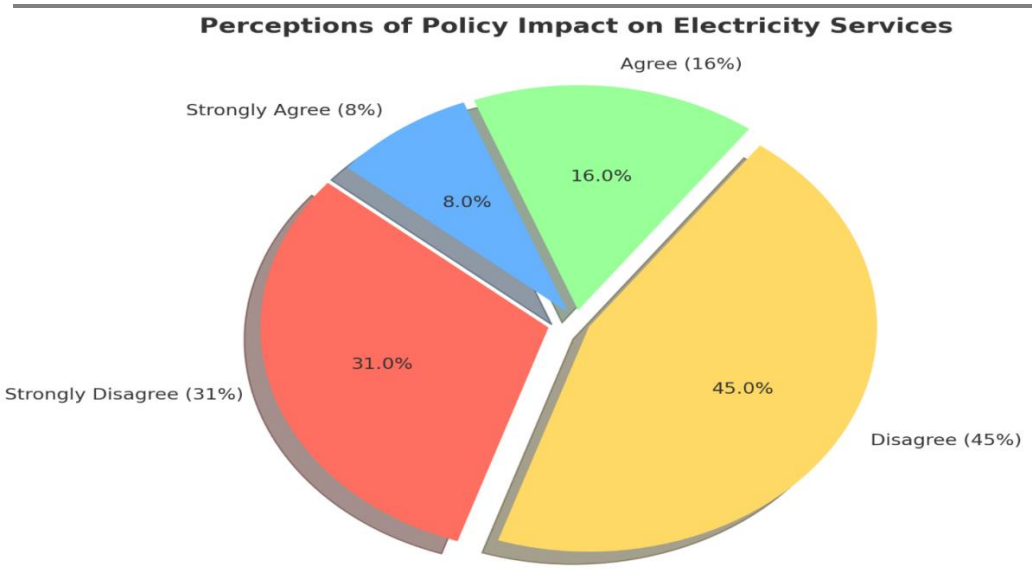

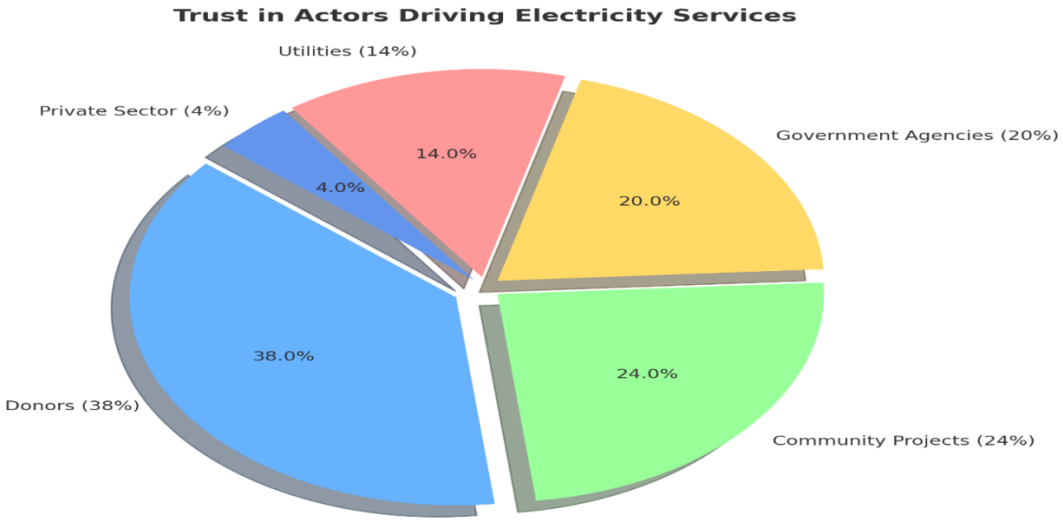

The three pie charts that capture the policy–performance perception gap in Sierra Leone's energy sector:

1. Policy Awareness
   - Only 32% of households were aware of policies like the National Electricity Access Policy (2015) and the Renewable Energy Action Plan (2016).
   - A striking 68% had little or no awareness.
2. Perceptions of Policy Impact
   - 76% (45% disagreed, 31% strongly disagreed) felt policies had not improved services.
   - Only 24% (16% agreed, 8% strongly agreed) believed policies made a positive impact.
3. Trust in Actors
   - Highest trust was placed in donors (38%) and community projects (24%).
   - Trust in government agencies (20%), utilities (14%), and the private sector (4%) was significantly lower.

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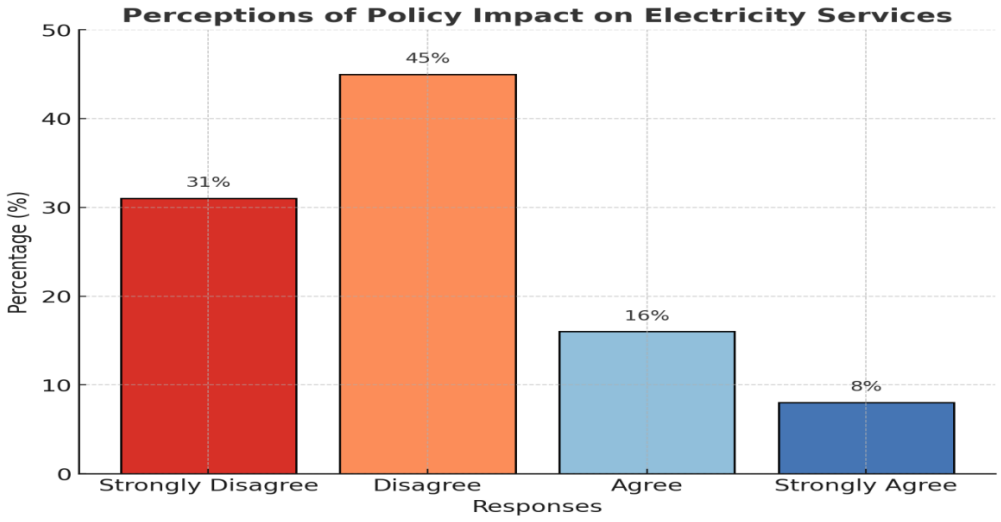
These findings highlight a significant disparity between policy design and public perception. While ambitious frameworks exist, weak communication, poor implementation, and service failures erode citizen confidence. Trust gravitates toward external donors and local initiatives rather than state-led actors, highlighting the urgent need for transparent reforms, inclusive communication, and credibility restoration.

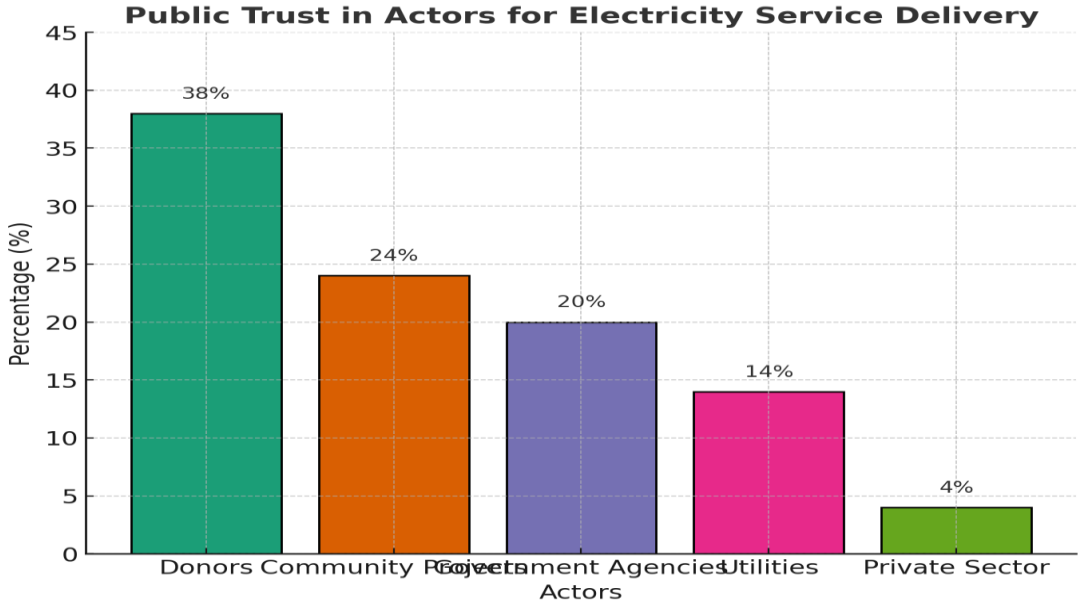
The survey revealed that policy awareness was **low (32%)**. Most households had only vaguely heard of initiatives such as the National Electricity Access Policy (2015) or the Renewable Energy Action Plan (2016).

When asked whether policies improved electricity services:

45% disagreed, 31% strongly disagreed, 16% agreed, and 8% strongly agreed.



Trust in actors was also telling:



The bar chart illustrating public trust in different actors for electricity service delivery. Donors received the highest trust (38%), while the private sector scored the lowest (4%).

i. Donors (38%)

ii. Community projects (24%)

iii. Government agencies (20%)

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iv. Utilities (14%)

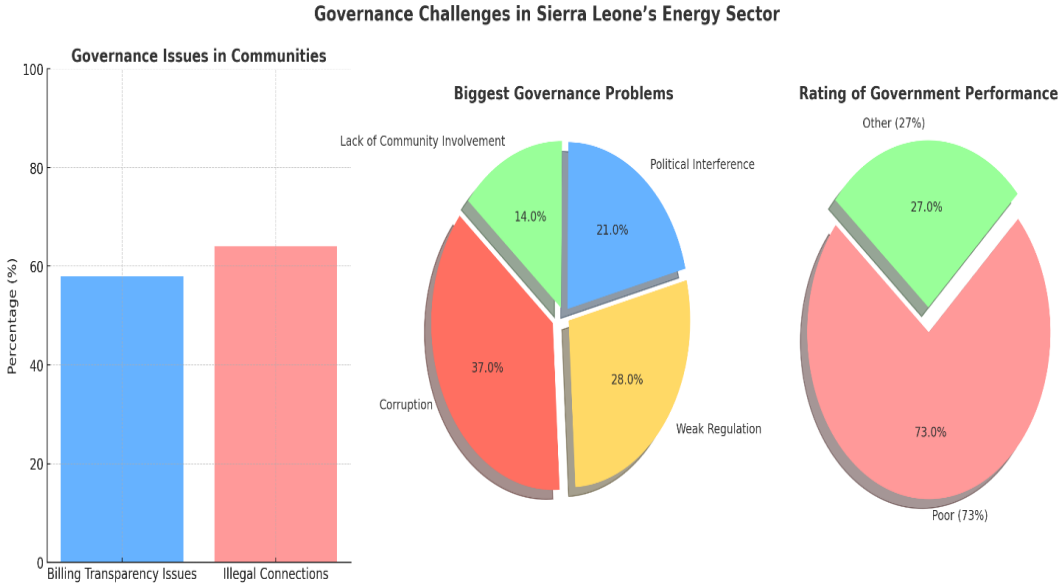
v. Private sector (4%)

This reflects the credibility crisis facing state institutions. FGDs consistently associated progress with **donor-led mini-grids** rather than government policies. One participant in Moyamba noted:

"We hear government promises on the radio, but here, only the donor solar project gives us some light."

This confirms that policy ambition has not been internalised at the community level, undermining citizen confidence in the state's capacity to deliver.

Governance, Transparency and Accountability



The composite graph showing governance challenges in Sierra Leone's energy sector:

1. Governance Issues
   - 58% flagged billing transparency problems.
   - 64% reported illegal connections in their communities.
2. Biggest Governance Problems
   - Corruption (37%) was the leading issue.
   - Followed by weak regulation (28%), political interference (21%), and lack of community involvement (14%).
3. Government Performance Rating
   - A striking 73% rated government performance as "poor."

The governance challenge is structural, marked by corruption, weak oversight, and political capture, which undermines trust, fuels illegal practices, and leaves citizens perceiving the government as ineffective.

Governance emerged as the central challenge.

- 58% said billing lacked transparency.

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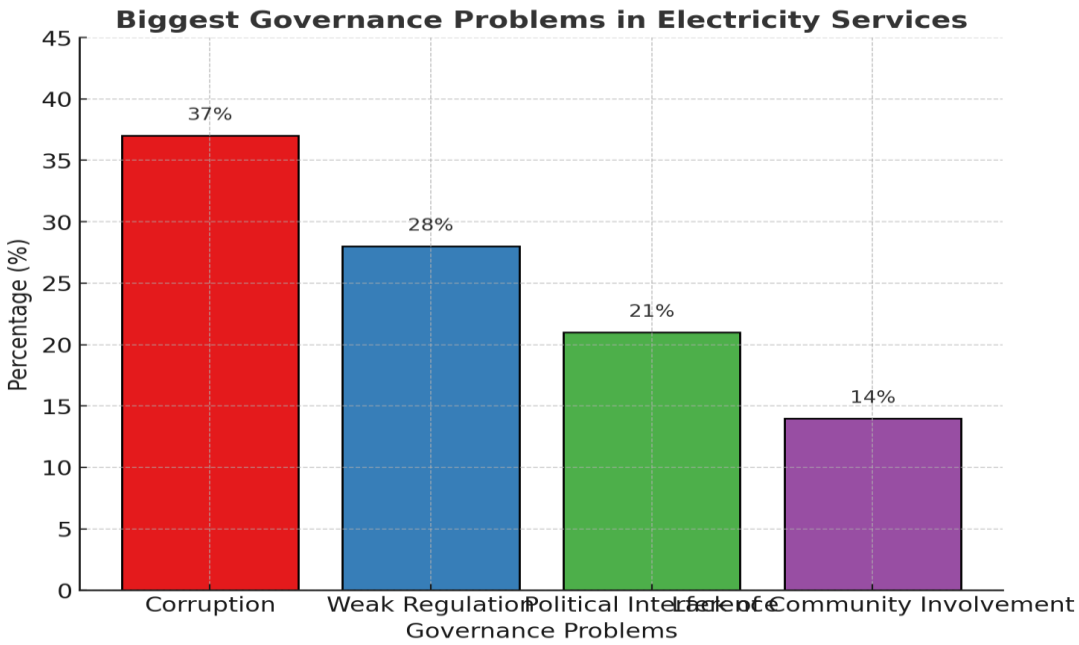
- 64% reported illegal connections in their communities.

When asked to identify the biggest governance problem:



i. Corruption (37%)

ii. Weak regulation (28%)

iii. Political interference (21%)

iv. Lack of community involvement (14%)

Overall, 73% of respondents rated the government's performance in the energy sector as "poor."

KIIs reinforced this. Regulators at EWRC admitted limited independence and capacity:

"We are supposed to enforce fair tariffs, but political considerations override technical assessments. Until we gain autonomy, our role remains weak."

Utilities acknowledged high system losses due to theft and technical inefficiencies, but attributed them to weak enforcement and a lack of investment. Donors complained of fragmented governance and inconsistent coordination.

This evidence aligns with institutional theories, suggesting that weak governance and capacity deficits hinder the translation of policies into results.

4.2.8 Energy Transition and Sustainability

Despite frustrations, optimism for renewable energy was striking.

i. 83% of households expressed a willingness to adopt solar or hydro energy if it were affordable.

ii. The desired support mechanisms included lower costs (64%), financing/credit (52%), and community management (36%).

iii. However, 59% of respondents doubted the sustainability of donor-funded projects after the exit.

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FGDs highlighted failed donor projects:

"When the donor left, the mini-grid stopped working. Nobody came to repair it. We need training to manage it ourselves," noted a participant in Tonkolili.

KIIs with donors echoed this concern. A World Bank official explained:

"Without integration into national frameworks, donor projects remain islands of light surrounded by darkness."

This indicates that while communities are eager for renewable energy, sustainability requires institutional ownership, regulatory clarity, and effective financing strategies.

Equity and Energy Justice

The findings underscored inequities in energy distribution.

i. 69% said urban residents benefit most, followed by businesses (19%). Only 12% believed rural households benefit significantly.

ii. FGDs highlighted gender disparities. Women continue to bear the brunt of energy poverty, spending hours collecting firewood and suffering from indoor air pollution.

"We women wake at 5 a.m. to gather firewood. If we had affordable electricity, our lives would be easier, and our children could study better."

This reveals that energy access is not only a development issue but a justice issue. Policies must address structural inequities that leave rural communities and women behind.

Convergence and Divergence of Findings

Triangulating the data reveals apparent **convergence** and **divergence**:

i. Convergence: All groups agree that policies exist, but they fail in practice. Affordability, Reliability, and governance are the main weaknesses. Donor projects are helpful, but they are unsustainable. Communities favour renewables.

ii. Divergence: Policymakers stress ambition and donor dependency; utilities focus on financial losses; regulators highlight weak authority; donors push for systemic integration; communities emphasise lived realities of exclusion and injustice.

This divergence reflects the policy–performance nexus, top-down ambition versus bottom-up failure.

DISCUSSION

The findings of this study offer a multidimensional perspective on Sierra Leone's energy sector, highlighting both the promise of policy ambition and the entrenched obstacles that hinder service delivery. They respond directly to the research questions while reinforcing the central argument that the sector's challenges are rooted less in the absence of vision than in systemic dysfunctions, governance deficits, and unsustainable dependency on donors. By examining the evidence through the lenses of policy implementation theory, governance, and institutionalist perspectives, as well as the study's conceptual framework, a more precise understanding emerges of why policies often fail to translate into effective performance.

The first research question asked: How effective are Sierra Leone's energy policies? Findings reveal that Sierra Leone has no shortage of ambitious policies. From the National Electricity Act to rural renewable initiatives, the country's frameworks closely align with global aspirations, such as SDG 7 and the African Union's

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Agenda 2063. Nevertheless, the effectiveness of these policies is undermined by weak implementation, poor coordination, and limited monitoring. This aligns with policy implementation theory (Pressman & Wildavsky, 1984), which emphasises that the distance between policy design and policy delivery is often where failure occurs. The rhetoric of universal access contrasts sharply with the lived reality of frequent outages and inequitable distribution. The lesson here is that ambition is necessary but insufficient; institutional strength and accountability are the decisive variables.

The second and third questions focused on systemic and institutional barriers to service delivery. The findings of corruption (37%), weak regulation (28%), political interference (21%), and lack of community involvement (14%) reflect governance deficits that go beyond technical constraints. According to governance theory (Rhodes, 1996), public service delivery relies on accountability, transparency, and responsiveness. In Sierra Leone, these attributes are weak. Utilities are not insulated from political interference, regulators lack enforcement power, and corruption erodes both financial resources and public trust. From the standpoint of institutionalism (North, 1990), the problem is not simply mismanagement but deeply entrenched institutional weaknesses. For instance, corruption diverts resources that could strengthen service delivery, while political interference undermines the autonomy of sector actors, such as EDSA and EWRC. Weak regulation allows illegal connections and billing inefficiencies to thrive, undermining revenue generation and perpetuating service unreliability. These structural dysfunctions confirm that the most significant barriers are institutional rather than technical in nature.

The third research question explored citizens' perceptions of affordability, reliability, and quality. The results are stark: electricity is widely perceived as unaffordable, unreliable, and unfairly distributed. High tariffs, frequent outages, and rural-urban disparities dominate the narrative. These perceptions align with equity and distributive justice theory (Rawls, 1971), which emphasises that policies must not only exist but also yield fair and inclusive outcomes. Where energy access is skewed in favour of urban elites, the legitimacy of the system is undermined. Moreover, unreliable electricity deepens economic vulnerability. Households divert scarce income to expensive alternatives such as diesel generators or kerosene, while businesses face production disruptions. Schools and health facilities are similarly constrained, perpetuating intergenerational poverty and inequality. Citizens' perceptions, therefore, are not just subjective judgments; they reflect real socio-economic consequences of poor governance and weak systems.

The fourth research question addressed the sustainability and inclusivity of donor-funded renewable energy projects. Findings suggest that while donors have played a catalytic role in introducing solar mini-grids and off-grid solutions, these projects often fail once external funding ends. The reasons, including a lack of community ownership, inadequate integration into national frameworks, and insufficient training, highlight the dangers of donor dependency. This aligns with dependency theory, which critiques reliance on external actors for critical services. Donor-driven projects may provide short-term relief, but they weaken long-term resilience if local institutions are not empowered to sustain them. Similarly, institutional capacity theory emphasises that sustainability depends on strengthening endogenous institutions rather than perpetuating reliance on exogenous support. Without local ownership and skills transfer, donor-funded initiatives risk becoming showcase projects rather than systemic solutions.

A notable weakness of the study is that while it identifies corruption, weak enforcement, and political interference as structural impediments, their direct impact on service outcomes has not been quantified. To strengthen policy relevance, future research should establish measurable correlations, such as estimating revenue losses from illegal connections, the percentage of outages linked to underinvestment caused by misappropriated funds, or the delays in electrification targets attributable to political interference. Similarly, reliance on secondary data in some areas, while pragmatic, highlights the need to strengthen Sierra Leone's statistical capacity and triangulate findings with administrative and utility-level datasets to ensure accuracy and reduce overdependence on external sources.

Similarly, the proposed hybrid framework, although conceptually robust, remains broad and prescriptive without detailed implementation pathways. To enhance applicability, it should be refined into actionable strategies with measurable indicators, such as reductions in system losses, the addition of renewable megawatts, affordability thresholds, and benchmarks for rural electrification. Financing also requires a deeper

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exploration, moving beyond donor aid to innovative mechanisms such as public–private partnerships, microgrid investments, blended climate finance, and results-based funding schemes. Community ownership, local accountability systems, and capacity-building should be integrated to safeguard sustainability, while lessons from regional best practices must be adapted carefully to Sierra Leone's fragile governance realities. Only through this combination of quantification, financial innovation, and contextual adaptation can the hybrid framework transition from conceptual ambition to practical reform.

The discussion demonstrates that Sierra Leone's energy sector is caught in a paradox. The country has ambitious policies and donor support, yet citizens continue to experience unreliable, unaffordable, and inequitable electricity. Breaking this paradox requires reimagining energy governance through the hybrid framework proposed in this study: strengthening governance institutions, enhancing financial sustainability, expanding renewable energy sources with local ownership, and embedding community inclusion.

Only through such a framework can Sierra Leone transition from rhetoric to reality, from dependence to resilience, and from exclusion to inclusive and equitable access. This vision aligns with both the study's conceptual framework and broader theoretical insights, offering a pathway to bridge the gap between policy ambition and service delivery performance.

Analysis

While the study sheds light on critical challenges, such as corruption, weak enforcement, and political interference, it is necessary to go beyond descriptive accounts and rigorously assess their measurable impact on service delivery. For example, corruption-related revenue leakages and illegal connections could be quantified in terms of lost megawatts, reduced hours of supply, or financial shortfalls. Weak enforcement could be correlated with non-revenue losses, while political interference could be analysed against tariff-setting delays or stalled reform initiatives. Establishing these quantifiable links would not only strengthen the evidence base but also provide policymakers with precise benchmarks for reform.

The reliance on secondary data in certain sections also warrants caution. In a context like Sierra Leone, where statistical capacity is limited, overdependence on external reports risks creating inaccuracies or outdated assumptions. To mitigate this, future research should triangulate secondary sources with administrative records, utility-level datasets, and independent household surveys. Integrating such triangulated evidence would enhance accuracy and credibility, while also capturing dynamic changes in energy access, affordability, and governance.

The proposed hybrid framework is an important contribution, but it remains broad and prescriptive. To be transformative, it should evolve into a sequenced roadmap with actionable strategies and measurable indicators. For instance, monitoring reductions in system losses (targeting below 20% by 2030), tracking the addition of renewable generation capacity (measured in MW), and setting affordability benchmarks (tariffs as a percentage of household income) would translate the framework into a performance-based tool. Embedding such metrics would enable policymakers, regulators, and donors to track progress systematically and effectively.

Equally, the financing dimension requires greater depth. Sierra Leone's fiscal constraints make it imperative to diversify beyond donor aid. Innovative financing models, such as public–private partnerships (PPPs), microgrids financed through blended capital, climate finance instruments, and results-based funding schemes**,** should be explicitly integrated into the framework. These mechanisms not only mobilise private capital but also align financial incentives with service delivery outcomes, ensuring sustainability.

The private sector's role must also be strengthened beyond being a peripheral investor. Lessons from Ghana and Senegal demonstrate that private utilities and independent power producers, operating under transparent regulatory frameworks, can enhance efficiency, expand access, and alleviate fiscal burdens. In Sierra Leone, well-structured PPPs, performance-based concessions, and renewable energy entrepreneurship could play similar roles if supported by apparent regulatory oversight and risk-sharing mechanisms.

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To ensure resilience, the framework must also incorporate community ownership, capacity-building, and local accountability systems. Evidence from rural mini-grids indicates that projects with community involvement in tariff design, operations, and oversight tend to have longer lifespans and greater legitimacy. Building technical capacity at the local level, combined with participatory governance structures, would reduce donor dependency and foster sustainability.

Finally, regional comparisons must move beyond descriptive benchmarking. Rather than merely citing successes from Ghana, Côte d'Ivoire, or Senegal, it is important to critically evaluate how these lessons can be realistically adapted to Sierra Leone's fragile governance environment. For instance, Ghana's success in electrification was underpinned by a relatively stable institutional framework, while Côte d'Ivoire's performance-based contracts thrived in a stronger regulatory environment. Sierra Leone, with weaker governance, must adapt these models pragmatically, scaling down their complexity, prioritising incremental reforms, and embedding accountability at every level.

The analysis reveals that Sierra Leone's energy sector requires more than policy ambition and donor projects. It demands a recalibrated hybrid framework, one that is measurable, financially viable, inclusive, and contextually adapted. By operationalising governance reforms, embedding financial innovation, fostering private sector participation, and empowering communities, Sierra Leone can begin to transform ambitious rhetoric into tangible performance outcomes.

Chapter Summary

This chapter presents and analyses data from household surveys (with a 95% response rate), KIIs, and FGDs. The findings revealed:

i. Nearly half of household's lack Access to electricity.

ii. For those connected, Reliability and Affordability are poor.

iii. Policy awareness is low, and trust in government is weak.

iv. Governance failures, corruption, interference, weak regulation, undermine delivery.

v. Donor projects offer short-term relief but often lack long-term sustainability.

vi. Equity issues persist, with rural and vulnerable groups left behind.

Ambitious policies fail to deliver due to systemic weaknesses and governance deficits**.** These findings set the stage for Chapter Five, which synthesises conclusions and proposes a framework to bridge the policy–performance gap in Sierra Leone's energy sector.

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Overview

Chapter Five provides a comprehensive synthesis of the study's key findings, linking them directly to the research objectives and questions while situating them within Sierra Leone's broader energy policy landscape. The chapter begins by revisiting the central aim of the study, understanding the policy–performance nexus in Sierra Leone's electricity sector, and highlights how the findings confirm that policy ambition has not been the sector's core challenge. Instead, systemic weaknesses such as governance deficits, corruption, political interference, weak regulatory enforcement, and utility inefficiencies emerge as the fundamental barriers to performance.

The chapter then evaluates citizens' perceptions of electricity affordability, reliability, and equity of distribution, revealing widespread dissatisfaction with service quality and fairness. It also assesses the sustainability of donor-funded renewable energy projects, noting that without strong community ownership,

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local capacity-building, and integration into national systems, these projects risk premature collapse. Significantly, the chapter moves beyond diagnosis to propose a pragmatic framework for reform. This hybrid approach emphasises strengthening governance and accountability, ensuring financial viability, expanding renewable energy integration, and fostering community inclusion as the pillars for bridging the persistent gap between policy intent and service outcomes.

Ultimately, Chapter Five positions the study as both diagnostic and prescriptive, underscoring the urgency of addressing entrenched institutional and systemic challenges while providing a roadmap for transformative change. By connecting evidence-based insights to actionable reforms, the chapter makes a strong case for how Sierra Leone can transition from ambitious policy design to effective energy service delivery.

Summary of the Study

Chapter Five consolidates the core findings of the study and highlights their implications for Sierra Leone's energy sector. The chapter reaffirms that the country's energy challenge is not rooted in a lack of policy ambition; rather, it is the persistent gap between policy design and implementation that undermines progress. While successive governments have launched bold initiatives to expand access, diversify energy sources, and attract investment, weak governance structures, corruption, political interference, and ineffective regulation have consistently eroded the potential impact of these policies.

The study's findings further illustrate how systemic inefficiencies within the Electricity Distribution and Supply Authority (EDSA) and other key institutions hinder service delivery. Issues such as non-transparent billing systems, high levels of illegal connections, and political control over tariff decisions compromise both revenue generation and customer trust. These governance and institutional deficits are compounded by financial fragility, as subsidies and donor dependence continue to dominate the sector's financing framework, leaving little room for sustainability.

On the demand side, citizens overwhelmingly perceive electricity as unaffordable, unreliable, and inequitably distributed. This dissatisfaction highlights the social dimension of the energy crisis, underscoring how inadequate service delivery exacerbates inequalities and erodes public confidence in state institutions. Similarly, donor-funded renewable energy projects, while valuable, have struggled with sustainability due to limited community ownership, weak integration into national frameworks, and insufficient capacity-building for local actors.

Against this backdrop, the chapter proposes a hybrid reform framework to bridge the policy–performance gap. This model emphasizes four interdependent pillars:

(1) Strengthening governance and accountability to reduce corruption and political interference;

(2) Ensuring financial sustainability through cost-reflective tariffs, revenue protection, and innovative financing models;

(3) Scaling up renewable energy deployment with proper integration and maintenance systems; and

(4) Fostering inclusive participation by empowering communities, civil society, and local institutions.

In conclusion, Chapter Five argues that Sierra Leone's energy transformation requires a decisive shift from rhetoric to results. By adopting reforms that integrate governance, finance, technology, and inclusivity, the country can unlock the promise of reliable, affordable, and sustainable electricity. This summary highlights the study's contributions as both an evidence-based diagnosis and a prescriptive roadmap for policymakers, regulators, donors, and communities committed to achieving universal energy access and long-term sector resilience.

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Key Findings

Access

The findings revealed that 53% of households had some form of Access**,** while 47% remained excluded from modern electricity services. Among those connected, the majority depended on the national grid (35%)**,** with smaller shares connected through donor-supported mini-grids (12%) and solar home systems (6%)**.** Rural–urban disparities were pronounced: 67% of rural households lacked Access, compared to 29% in urban centres. This confirms that access expansion remains uneven, despite ambitious national targets.

Reliability

Access did not translate into Reliability. 72% of connected households received fewer than nine hours of supply per day, and 71% experienced more than ten blackout days monthly. Outages were often prolonged, with 33% lasting 1–4 hours**,** 29% lasting 5–12 hours, and 21% lasting beyond 12 hours**.** Overall, 68% of households were dissatisfied with Reliability, citing adverse effects on livelihoods, education, and welfare.

Affordability

Affordability emerged as a critical barrier. 39% of households spent between Le 301,000 and Le 600,000 monthly on electricity, while 26% spent more than Le 600,000, primarily urban, business-oriented households. Nevertheless, only 7% described electricity bills as affordable**,** while 66% deemed them unaffordable or very unaffordable. This highlights the burden of energy costs relative to incomes, effectively reinforcing energy poverty.

Policy Awareness and Perceptions

Policy awareness was strikingly low; only 32% of households were aware of significant energy policies such as the National Electricity Access Policy (2015) and Renewable Energy Action Plan (2016). Moreover, 76% (45% disagreed, 31% strongly disagreed) felt policies had not improved services. Trust in actors was skewed toward donors (38%) and community projects (24%)**,** with much lower confidence in government agencies (20%)**,** utilities (14%), and the private sector (4%). This reflects an ongoing legitimacy crisis in state-led interventions.

Governance

Governance was identified as the central challenge**.** 58% reported that billing lacked transparency, and 64% noted the presence of illegal connections in their communities. The biggest governance concerns were corruption (37%)**,** weak regulation (28%)**,** political interference (21%), and lack of community involvement (14%)**.** Ultimately, 73% rated government performance as poor, underscoring deep mistrust and institutional weakness.

Conclusions

This study has examined the policy–performance nexus in Sierra Leone's energy sector to identify the underlying causes of persistent service delivery failures and outline a framework for reform. The evidence gathered from households, key informants, and secondary data reveals a consistent theme: while Sierra Leone's energy policies are ambitious and aligned with international best practices, their implementation has been undermined by systemic weaknesses. These include governance deficits, corruption, political interference, inadequate regulation, and institutional inefficiencies.

The analysis confirms that the problem lies less in policy ambition and more in institutional capacity and enforcement. Policies designed to expand access and improve service quality remain largely aspirational because institutions tasked with implementation lack autonomy, resources, and accountability. For instance, the Electricity Distribution and Supply Authority (EDSA) and the Electricity and Water Regulatory

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Commission (EWRC) face significant political and financial constraints, reducing their ability to enforce compliance and ensure efficient service delivery.

Citizen perspectives reinforce this diagnosis. The majority of respondents perceive electricity as unaffordable, unreliable, and unfairly distributed. Widespread illegal connections, non-transparent billing systems, and frequent blackouts further weaken public trust in both utilities and government institutions. Meanwhile, donor-funded renewable energy projects, despite their potential, face sustainability risks due to poor local integration, limited ownership, and weak capacity-building initiatives.

In short, the sector's central challenge is not a lack of vision but the absence of credible systems to translate vision into impact. Addressing this gap requires a holistic framework that integrates governance reforms, financial sustainability, renewable energy expansion, and inclusive participation. Only by combining these dimensions can Sierra Leone build an energy sector that is reliable, affordable, equitable, and sustainable.

Recommendations

Strengthen Governance and Institutional Accountability

i. Empower EDSA and EWRC with greater autonomy and capacity to regulate tariffs, enforce compliance, and penalise malpractices without political interference.

ii. Establish annual performance audits and publish reports on revenue protection, losses, and corruption to increase transparency.

iii. Introduce digital monitoring systems to track procurement, billing, and distribution in real time, thereby minimising opportunities for manipulation.

Ensure Financial Sustainability

i. Transition toward cost-reflective tariffs that balance financial viability with affordability for vulnerable households. A lifeline tariff structure should be maintained to protect low-income consumers.

ii. Expand innovative financing mechanisms, such as public–private partnerships (PPPs), green bonds, and climate finance facilities, to reduce dependence on donor grants and subsidies.

iii. Improve revenue collection through prepaid metering, customer sensitisation, and anti-theft campaigns that target illegal connections and billing fraud.

Scale Up Renewable Energy Integration

i. Mainstream renewable energy into national planning, ensuring that solar, hydro, and mini-grid projects are integrated with EDSA's distribution framework.

ii. Prioritise capacity-building for local technicians and communities to ensure maintenance, operation, and eventual ownership of renewable energy systems.

iii. Align donor-funded projects with national strategies, requiring sustainability clauses that guarantee training, technology transfer, and long-term funding models.

Foster Inclusive Community Participation

i. Engage civil society organisations, traditional leaders, and community associations in energy planning, monitoring, and evaluation to build ownership and reduce resistance.

ii. Establish feedback and grievance mechanisms that allow citizens to report service failures, illegal practices, and corruption, thereby strengthening accountability loops.

iii. Expand energy access programs that specifically target rural areas, women, and youth, ensuring that equity is at the heart of reform.

Promote Regional Integration and Resilience

i. Leverage the West African Power Pool (WAPP) to diversify supply, stabilise prices, and strengthen Sierra Leone's energy security.

ii. Develop strategies to mitigate external shocks, such as global fuel price volatility and climate change impacts, through diversified energy sources and investment in resilient infrastructure.

iii. Adopt digital innovation, including smart grids and energy management systems, to modernise the sector and improve efficiency.

The road to reliable and sustainable energy in Sierra Leone demands courage, commitment, and consistency. This study concludes that reforms must go beyond technical fixes to address the political economy of energy governance. Strong leadership, robust institutions, transparent financing, and citizen participation are indispensable. If these recommendations are embraced, Sierra Leone can transform its energy sector from a source of frustration into a driver of socio-economic growth, industrialisation, and national resilience. The time for incremental adjustments has passed; what is required now is decisive action that turns ambitious policies into tangible performance.

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APPENDIX

Annex A. Research Questionnaire

Study Title: Understanding the Policy–Performance Nexus in Sierra Leone's Energy Sector

Section A: Demographic Profile

1. Gender: ☐ Male ☐ Female ☐ Other

2. Age: ☐ 18–25 ☐ 26–35 ☐ 36–45 ☐ 46–60 ☐ 61+

3. Educational level:

☐ None ☐ Primary ☐ Secondary ☐ Tertiary ☐ Other _____

4. Occupation: ☐ Farmer ☐ Trader ☐ Civil servant ☐ Student ☐ Unemployed ☐ Other _____

5. Household size: _____ persons

6. District/Community: _____

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Section B: Energy Access

7. Do you currently have access to electricity?

☐ Yes (National Grid) ☐ Yes (Mini-grid) ☐ Yes (Solar Home System) ☐ No access

8. If no, what is your main source of lighting?

☐ Candles ☐ Kerosene ☐ Firewood ☐ Torch/flashlight ☐ Other _____

9. On average, how many hours per day do you have electricity supply?

☐ 0–4 hrs ☐ 5–8 hrs ☐ 9–16 hrs ☐ 17–24 hrs

10. In the last month, how many days did your household experience complete blackout?

☐ None ☐ 1–5 ☐ 6–10 ☐ More than 10

Section C: Affordability and Billing

11. What is your household's average monthly electricity expenditure?

☐ < Le 100,000 ☐ Le 100,000–300,000 ☐ Le 301,000–600,000 ☐ > Le 600,000

12. Do you use a prepaid meter?

☐ Yes ☐ No

13. How affordable do you consider your electricity bill?

☐ Very affordable ☐ Affordable ☐ Unaffordable ☐ Very unaffordable

14. Have you ever reduced electricity usage due to high cost?

☐ Yes ☐ No

Section D: Reliability and Quality of Supply

15. How often do you experience power outages?

☐ Daily ☐ Weekly ☐ Monthly ☐ Rarely/Never

16. When outages occur, how long do they typically last?

☐ < 1 hour ☐ 1–4 hours ☐ 5–12 hours ☐ > 12 hours

17. How satisfied are you with the reliability of electricity?

☐ Very satisfied ☐ Satisfied ☐ Dissatisfied ☐ Very dissatisfied

18. Do power cuts affect your children's schooling, business activities, or household wellbeing?

☐ Yes ☐ No (If yes, explain briefly: _____)

Section E: Awareness and Perceptions of Policy

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19. Are you aware of government energy policies (e.g., Electricity Act 2011, NEAP 2015, NREAP 2016)?

☐ Yes ☐ No

20. Do you think these policies have improved electricity services?

☐ Strongly agree ☐ Agree ☐ Disagree ☐ Strongly disagree

21. In your view, are policies designed with community realities in mind?

☐ Yes ☐ No ☐ Not sure

22. Who do you trust most to improve electricity service delivery?

☐ Government ☐ EDSA/EGTC ☐ Private sector ☐ Donors ☐ Community projects

Section F: Governance, Transparency and Accountability

23. Do you consider electricity billing and tariff setting to be transparent and fair?

☐ Yes ☐ No ☐ Don't know

24. Have you seen or experienced illegal electricity connections in your community?

☐ Yes ☐ No

25. In your opinion, what is the biggest governance problem in the energy sector?

☐ Corruption ☐ Poor accountability ☐ Political interference ☐ Weak regulation ☐ Lack of community involvement

26. How would you rate overall government performance in electricity service delivery?

☐ Excellent ☐ Good ☐ Fair ☐ Poor

Section G: Energy Transition and Sustainability

27. Would you adopt renewable energy (solar, wind, mini-hydro) if it was affordable and reliable?

☐ Yes ☐ No ☐ Not sure

28. What support would encourage adoption of renewable energy?

☐ Lower costs ☐ Financing/credit ☐ Reliability ☐ Community management ☐ Training/awareness

29. Do you believe donor-funded projects (e.g., mini-grids, solar) can be sustained after donors leave?

☐ Yes ☐ No ☐ Not sure (Explain briefly: _____)

30. Do you believe renewable energy can solve Sierra Leone's electricity challenges?

☐ Strongly agree ☐ Agree ☐ Disagree ☐ Strongly disagree

Section H: Equity and Justice

31. Who benefits most from electricity services in your community?

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☐ Urban residents ☐ Rural elites ☐ General households ☐ Businesses ☐ Don't know

32. Do you think women and vulnerable groups face more difficulties in accessing affordable electricity?

☐ Yes ☐ No ☐ Not sure

33. What steps should government and partners take to ensure electricity is shared fairly? _____

Section I: Open-Ended Questions

34. What are the three biggest changes you would like to see in Sierra Leone's electricity services? _____

35. If you could advise the government or EDSA directly, what would you recommend? _____

Annex B: Measurable Indicators For Energy Sector Reform

This annex translates identified weaknesses in Sierra Leone's energy sector into practical refinements, measurable indicators, and 2030 benchmarks. It serves as a monitoring tool for the Ministry of Energy, EDSA, EWRC, development partners, and private investors.

Table A1 Linking Weaknesses to Actionable Indicators

Weakness Identified	Suggested Refinement	Measurable Indicators	Target Benchmarks (2030)
Corruption, weak enforcement, and political interference not quantified	Quantify direct impact on service outcomes	• % of revenue lost due to illegal connections and billing fraud • Number of politically influenced tariff decisions per year • % of budget diverted/underutilised due to corruption	• Reduce non-technical losses from 35–40% to ≤15% • Zero political interference in tariff adjustments • Annual anti-corruption audit reports published
Reliance on secondary data raises accuracy concerns	Strengthen data quality through triangulation	• % of energy indicators verified by independent surveys • Frequency of updated utility performance reports • Number of administrative datasets digitised	• At least 90% of key indicators validated annually • Quarterly performance reports by utilities • Full digitalisation of billing and customer data
Hybrid framework broad/prescriptive	Refine into actionable strategies with metrics	• System loss reduction targets • Renewable capacity added (MW per year) • Rural electrification expansion rate • Tariff-to-income affordability ratio	• Losses reduced to ≤15% by 2030 • 250 MW new renewable capacity added • 85% national access; 60% rural access • Electricity bills ≤10% of household income
Financing mechanisms underdeveloped	Integrate PPPs, micro-grids, results-based funding	• Number/value of PPP contracts signed • % of energy investment from private sector • Results-based disbursements	• At least 30% of sector financing from PPPs • 50% of off-grid electrification through micro-grids • Results-based funds tied to ≥80%

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		linked to performance	project milestones
Limited role of private sector	Strengthen engagement as service providers	• Number of independent power producers (IPPs) contracted • Share of generation/distribution managed by private sector under regulation	• 40% of new generation capacity from IPPs • At least 20% of distribution managed by regulated private operators
Weak community ownership and sustainability	Embed local participation and accountability	• % of mini-grids under community management • Number of trained local technicians per district • Community oversight committees established	• 70% of rural mini-grids community-managed • 500+ technicians trained nationwide • Oversight committees in every electrified district
Regional best practices described but not adapted	Assess contextual applicability	• Number of regional lessons adapted into national reforms • % of policy reforms benchmarked against ECOWAS/WAPP standards	• At least 5 best practices (e.g., Ghana's PURC, Senegal's PPP solar model) adapted • Full compliance with ECOWAS/WAPP integration targets

Note. This table was developed by the researcher based on study findings and regional energy sector benchmarks.

Annex:3 Sierra Leone's Energy Score Card