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**Bridging the Energy Access Divide:
A Policy Gap Analysis of 12 African National Energy
Compacts Under Mission 300**

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ABSTRACT

Africa stands at a pivotal juncture in its energy trajectory, where bold aspirations for universal electrification by 2030 confront entrenched structural and institutional barriers. Despite decades of targeted development assistance and a surge in international investment, over 600 million people across the continent remain without access to electricity, while more than 80% of rural populations continue to rely on traditional biomass for cooking. In response to this pressing challenge, twelve African governments have aligned themselves with the World Bank's Mission 300 Energy Compacts, committing to universal access through a suite of reform-oriented and infrastructure-driven strategies. This study conducts a comparative policy gap analysis, evaluating the national compacts across five critical thematic domains: (1) institutional readiness, (2) regulatory efficiency, (3) financial viability, (4) infrastructure and regional integration, and (5) clean cooking solutions. Using a structured data extraction methodology from each country's energy compact, the study systematically maps declared policy measures, assesses implementation potential, and compiles findings into a Policy Strength Table. In-depth country-level analyses reveal a persistent gap between declared ambition and tangible action. While countries such as Côte d'Ivoire, Nigeria, and Senegal exhibit relatively robust institutional frameworks and stronger financial readiness, others—notably Chad, Zambia, and the Democratic Republic of Congo (DRC)—are encumbered by utility debt burdens, chronic underinvestment, and stalled reform agendas. Furthermore, regional power integration efforts remain fragmented, and clean cooking interventions are either nascent or underdeveloped across all examined states. As the African population is projected to double by 2050, the success of Mission 300 hinges on bridging these implementation gaps. This will require enhanced concessional financing, predictable regulatory environments, and a revitalized push toward regional coordination and infrastructure interconnectivity.

1. Introduction

Africa's energy sector continues to face deep-rooted underdevelopment, despite decades of targeted electrification programs, multilateral financing, and policy reform initiatives (Bazilian et al., 2012; Agoundedemba et al., 2023). The continent holds vast renewable energy potential, yet over 600 million people still lack access to electricity, and more than 80% of rural households depend on biomass for cooking (Batchelor et al., 2018; Mensah and Breyer, 2021; Du et al., 2021; Mensah et al., 2024). This persistent energy poverty stems from institutional weaknesses, insufficient investment in grid infrastructure, and regulatory inefficiencies that have consistently undermined the impact of past and ongoing efforts (Foster and Dyson, 2021; Onuh et al., 2024). With the continent's population projected to double by 2050, the need for reliable energy access has become not only a policy priority but a development imperative (Dagnachew et al., 2020).

In this context, the Mission 300 Energy Compacts were launched during the World Bank's Africa Energy Summit, with twelve African countries committing to achieve universal access by 2030 through expanded infrastructure, improved grid reliability, and transitions to cleaner energy. However, this initiative is not without precedent. It follows a lineage of global and regional programs—such as the West African Power Pool (WAPP), the Southern African Power Pool (SAPP), the Scaling Up Renewable Energy in Low-Income Countries Program (2009), Sustainable Energy for All (2011), Power Africa (2013), and the New Deal on Energy for Africa (2016)—many of which were well-financed but underperformed due to implementation delays, fiscal gaps, and regulatory mismatches (Hancock, 2024; Mulugetta et al., 2022; Chirambo, 2018; Moss and Bazilian, 2018).

Despite their shortcomings, these earlier initiatives did lay important groundwork. For instance, Nigeria has leveraged regulatory frameworks developed under Power Africa to expand mini-grid deployment (Sesan et al., 2024; Fajardo et al., 2025; Nyarko et al., 2025), while Madagascar has used the SEforALL-supported Universal Energy Facility to roll out dozens of solar mini-grid projects through performance-based grants (Backer et al., 2023). These examples demonstrate that although scale and coordination were often lacking, institutional and technical platforms established during previous programs are now being adapted to support Mission 300 objectives.

Nonetheless, the Compacts face persistent systemic barriers that threaten their long-term success. One major risk is the potential retrenchment of U.S. development programs like Power Africa and USAID-backed initiatives, which are increasingly vulnerable to shifting foreign policy and political volatility. As Moss and Bazilian (2018) argue, sustained bipartisan commitment and institutional continuity are essential for programmatic durability across political cycles.

Another critical constraint is the continent's workforce readiness gap. While past efforts have invested in vocational training and institutional capacity building, many countries still lack the skilled labor needed to implement and maintain infrastructure in areas such as clean cooking, grid deployment, and data-driven utility management (Eberhard and Shkaratan, 2012; Pistelli, 2020). These human capital bottlenecks have historically slowed grid expansion and limited the impact of capital-intensive investments—and they remain inadequately addressed in most current compacts.

Since the early 2000s, Africa's energy landscape has been shaped by overlapping but fragmented initiatives. SEforALL emphasized reform and finance mobilization; Power Africa focused on PPPs and bankable transactions; SREP and GEAPP prioritized renewable energy generation; and AfDB's New Deal set ambitious continental targets. However, progress has often been hampered by donor fragmentation, weak national ownership, and shallow institutional capacity.

This study assesses whether the Mission 300 Compacts represent a meaningful shift from these past approaches or simply repackaged old ambitions with new deadlines. It does so through a comparative policy gap analysis across five thematic areas unique to Africa's energy landscape: Institutional Readiness: The ability of national governments to implement policies and enforce regulations; Regulatory Efficiency: The strength and transparency of legal frameworks, tariffs, and licensing procedures; Financial Readiness: The sustainability of utilities, presence of investment de-risking tools, and efficiency of revenue collection systems; Infrastructure & Regional Integration: The state of grid expansion, transmission capacity, and participation in regional power markets; and Clean Cooking Strategies: National strategies to reduce reliance on traditional biomass through the adoption of modern cooking technologies.

The analysis also situates the Compacts within broader demographic dynamics. With an average rural population of 58% and a growth rate of 2.71% across participating countries, electrification plans must not only close existing gaps but also anticipate surging future demand driven by urbanization. Past

initiatives often failed in this regard, resulting in congested grids, idle generation assets, and delayed distribution rollouts (Kayisu et al., 2024).

The final section synthesizes cross-cutting constraints that continue to affect implementation—such as aid dependency, capacity gaps, and fragmented regulation—alongside evidence-based recommendations for governments, donors, and private actors. Figures 1 through 3 illustrate access targets, rural-urban demographics, and growth projections, underscoring the urgency and scale of Africa’s energy transition by 2030. Table 1 contains a summary of the energy context and challenges from these 12 countries as extracted their compacts.

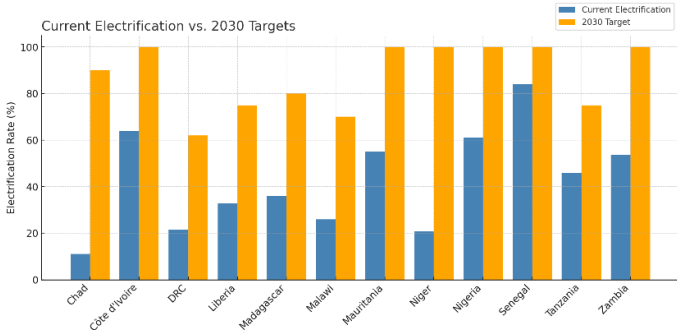


Figure 1. current vs 2030 electrification target of 12 African countries under mission 300

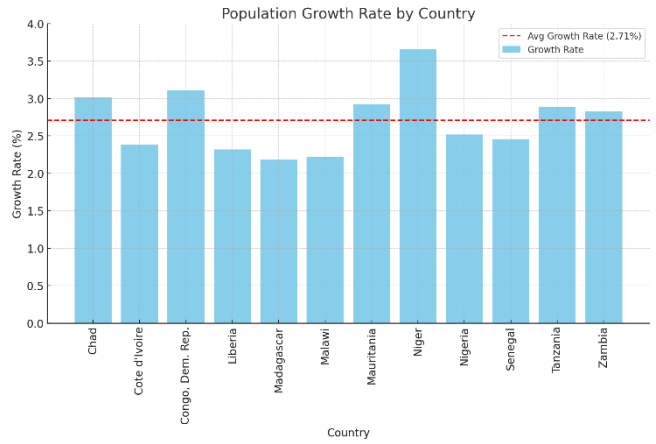


Figure 3. population growth against its average (data source: US Census Bureau, 2024)

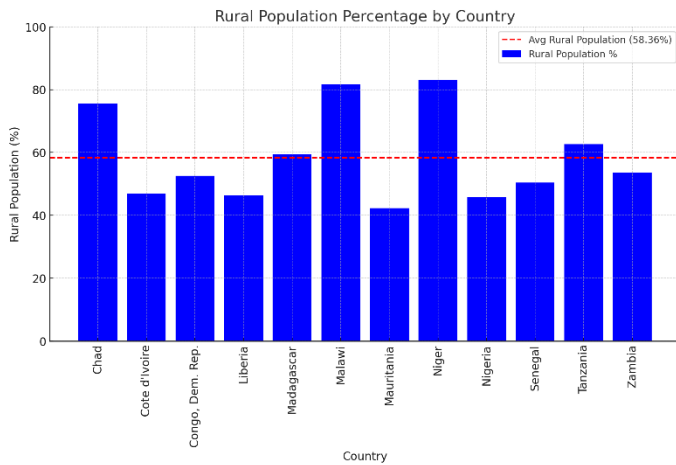


Figure 2. percent of rural population against its average (data source: World Development Indicators, World Bank Group, 2023)

Table 1 – Core Energy Challenges of the 12 African countries

Country	National Energy Context/Challenges
Chad	<ul style="list-style-type: none"> • Extremely low national electrification rate (11%), with rural access below 1%, creating a wide urban-rural divide. • Heavy dependence on biomass fuels (wood and charcoal), used by over 89% of households, contributing to deforestation and health hazards. • High electricity production costs, primarily due to dependence on thermal generation using crude and heavy fuel oil. • Fragmented and underdeveloped transmission and distribution network, with only 838 km of LV and 467 km of MV lines nationwide. • No operational interconnection with neighboring countries, and no harmonized transmission tariffs under the Central African Power Pool (CAPP). • Low electricity consumption per capita (47 kWh/year), the lowest in the CILSS and CEMAC regions. • Financially unstable and underperforming national utility (SNE), with a 45% revenue collection rate and a billing rate of 65%. • Technical and commercial losses remain high, with a target (not yet achieved) to reduce losses below 15% by 2027. • Absence of a performance contract between SNE and the government, leading to weak accountability and oversight. • Lack of operational and financial management tools at SNE, including absence of manuals for procurement, fuel, billing, and administration. • Outdated or incomplete institutional and regulatory frameworks, including unimplemented provisions of Law 036/19. • Weak private sector participation, limited to a few IPPs, due to unclear licensing processes and lack of competitive procurement mechanisms. • Clean cooking access is critically low, with no baseline data or operational national strategy; most households rely on traditional fuels. • Limited availability and accessibility of LPG, including a lack of small-size bottles for low-income households. • Insufficient financial de-risking mechanisms to attract and scale up private investment in energy. • Underutilized renewable energy potential (solar, wind, hydro), despite high natural resource availability. • Limited city-level electrification planning, with only N’Djamena having a master plan; other major cities still lack structured plans. • Slow implementation of performance audit and reform plans for SNE, with critical reforms only expected to begin in 2025. • Need for USD 1.95 billion in investment, including USD 650.3 million expected from the private sector, to achieve energy access goals. • Absence of integrated least-cost planning that considers lifecycle costs, demand growth, and regional resource sharing. • Electricity access projects depend heavily on donor support, with a high reliance on concessional financing and development aid.
Côte d'Ivoire	<ul style="list-style-type: none"> • Electricity access remains at 64%, with rural areas significantly underserved despite a target of 100% by 2030. • Heavy dependence on fossil fuels, particularly natural gas, despite a 45% renewable energy generation target by 2030. • USD 15.02 billion required for energy expansion, with USD 6.56 billion still to be mobilized, underscoring the need for stronger private sector participation. • Regulatory and institutional frameworks for renewables remain incomplete, slowing deployment despite a dedicated RE law. • CI-ENERGIES faces financial sustainability challenges, including tariff gaps, cost recovery issues, and delayed payments. • High electricity subsidies strain the national budget, reducing fiscal space for infrastructure investment. • Technical and commercial losses remain high, particularly in distribution, affecting utility performance. • Distribution networks are congested and aging, especially in urban peripheries and industrial zones. • Tariff reform remains incomplete, with rates still below cost-recovery levels. • Liquidity constraints at CI-ENERGIES are aggravated by delayed government reimbursements and insufficient recovery mechanisms. • Delays in regional interconnection projects (e.g., Mali, Guinea, Liberia) hinder cross-border electricity exports under WAPP. • Lack of a unified national electrification planning framework, with fragmented institutional responsibilities. • Limited planning tools for least-cost electrification, particularly for rural and off-grid areas. • Incentives for private off-grid participation are limited, especially in underserved rural regions. • Clean cooking access remains low (20%), with a target of 50% by 2030 requiring scaled LPG and improved cookstove access. • No institutionalized clean cooking subsidy framework, though it is recognized as a policy priority. • Limited rural access to clean cooking technologies, due to high upfront costs and weak distribution channels.

	<ul style="list-style-type: none"> • Lack of reliable market data on clean cooking solutions, hindering policy design and tracking. • Slow implementation of renewable energy decrees, affecting investor confidence and project development timelines.
Democratic Republic of the Congo (DRC)	<ul style="list-style-type: none"> • Electricity access is just 21.5%, with rural access below 5%, hindering inclusive growth. • The renewable energy share is 95%, largely dominated by hydropower, yet capacity remains underutilized. • The country requires USD 37 billion in investment, but mobilization has been slow, especially from private sources. • Transmission and distribution losses are 46%, among the highest globally. • Frequent blackouts, even in cities, result from congestion and insufficient reserves. • Institutional mandates are fragmented, weakening coordination and delivery. • The 2014 Electricity Law ended SNEL’s monopoly, but reform impacts remain limited by SNEL’s continued dominance and sector inefficiencies. • A national electrification master plan is planned, but not yet in place. • Off-grid efforts are fragmented, with weak coordination among stakeholders. • Standardized PPAs and grid connection protocols are lacking, discouraging IPPs. • The Compact proposes a one-stop shop to streamline energy investment processes. • Risk mitigation tools (e.g. guarantees, blended finance) are underutilized. • SNEL is financially unsustainable, burdened by subsidies, low tariffs, and USD 110M in public sector arrears. • Tariffs remain below cost-recovery levels, limiting reinvestment. • Clean cooking access is critically low (≈2%), with over 90% of households depending on charcoal and firewood. • A National Clean Cooking Strategy is planned, but has not yet been adopted or implemented. • Supply chains for clean cooking technologies remain underdeveloped, especially in rural and peri-urban areas.
Liberia	<ul style="list-style-type: none"> • Electricity access is 32.7%, with rural access below 10%, reflecting a significant urban-rural divide. • Only 25% of the population is connected to the LEC grid, with an additional 7.7% relying on off-grid sources. • Access to clean cooking is negligible, with no established baseline and no national strategy yet in place. The government has committed to developing a comprehensive national cooking strategy by 2026 to improve access, particularly for female-headed households. • At the current pace, Liberia is projected to reach only 50% electricity access by 2030, falling short of its 75% national target. • LEC suffers from poor financial performance, including low cost recovery, high losses, and continued reliance on donor support. • Aging grid infrastructure results in technical and commercial losses, frequent outages, and limited ability to serve new or productive users. • The Côte d’Ivoire–Liberia 225 kV interconnection remains incomplete, slowing regional power trade and integration. • Seasonal variability in hydropower supply causes fluctuations in grid reliability. • USD 1.25 billion is needed to meet national electrification goals, with USD 150 million targeted from the private sector. • Policy gaps, limited enforcement, and institutional inefficiencies undermine investor confidence and slow implementation. • Mandate overlaps among LEC, RREA, and LERC contribute to delays and weak coordination. • Liberia lacks a geospatial least-cost electrification plan, hindering efficient deployment of both grid and off-grid systems. • Permitting processes are slow, and there is no centralized one-stop shop to facilitate energy investment. • Clean cooking supply chains are informal and underdeveloped, lacking scale and standardization.
Madagascar	<ul style="list-style-type: none"> • Electricity access remains low at 36%, with rural areas significantly underserved. • The vast majority of households rely on traditional solid fuels for cooking, with less than 1% using clean cooking solutions and only 14% using improved stoves. • Power infrastructure is aging and unreliable, with frequent blackouts and nearly 30% system losses. • Heavy dependence on imported diesel increases exposure to global price volatility. • \$7.2 billion in investment is needed by 2030, but private capital mobilization remains limited. • Regulatory delays and unclear IPP frameworks discourage renewable energy investment.

	<ul style="list-style-type: none"> • JIRAMA faces deep financial instability, including \$400M in debt and \$250M in annual operating losses. • No regional interconnection exists, limiting cross-border electricity trade and regional energy integration.
Malawi	<ul style="list-style-type: none"> • Low electricity access: Only 25.9% of the population has access to electricity; rural access is just 3.8%. • Widespread energy poverty: 48.3% of households live within grid range but remain unconnected due to high fees and internal wiring costs. • Unaffordable energy use: 45.3% of grid-connected households cannot afford 365 kWh/year for basic needs. • Overdependence on biomass: Over 98% of households rely on biomass for cooking; clean cooking access is only 2%. • Severe deforestation and health risks: Biomass dependence contributes to deforestation and indoor air pollution. • Aging and unreliable infrastructure: Power outages are frequent due to aging transformers and poorly maintained infrastructure. • High energy losses: Transmission and distribution losses are around 24%, undermining grid efficiency. • Hydro-dominated energy mix: 73% of generation is hydro, making the system highly vulnerable to climate variability. • Significant generation gap: An additional 848 MW is needed by 2030, with 714 MW expected from the private sector. • Underfunded investment pipeline: Only \$530.8M of the required \$5.5B to 2030 is secured, leaving a \$4.95B gap. • Weak mini-grid financing: Mini-grids face low private sector interest due to poor financial returns and weak incentives. • Imported technology dependency: Most clean cooking and off-grid solutions rely on imports, raising costs. • Limited local manufacturing and supply chains, hindering affordability and scale-up of clean energy technologies. • Digitalization and data gaps: ESCOM lacks full customer databases, real-time monitoring, and GIS mapping systems. • Institutional coordination gaps: Energy access is not fully integrated into education, health, and productive sectors. • Unreliable institutional electrification: Many schools and health centers have inadequate or intermittent power. • Regulatory bottlenecks: The IPP framework is outdated, and project approvals are slow and unclear. • Weak district-level planning: Local authorities have limited capacity to coordinate or implement energy access programs. • Utility financial distress: ESCOM faces high debt, low cost recovery, forex risks, and operational inefficiencies.
Mauritania	<ul style="list-style-type: none"> • Electricity access is 55%, with severe rural-urban disparity (91% urban vs. 6% rural); achieving universal access by 2030 will require connecting 3.4 million more people. • Heavy reliance on fossil fuels, particularly heavy fuel oil, increases production costs and weakens financial sustainability. • High technical and commercial losses, especially due to long low-voltage lines in horizontally sprawling cities like Nouakchott. • Fragmented national grid, with ~250 localities operating isolated systems and lacking integration. • Massive renewable potential (solar and wind) remains largely untapped; solar irradiation is 2,000–2,300 kWh/m²/year, and wind speeds along the coast reach 9–11 m/s. • Clean cooking access is just 4%, with a target to reach 54% by 2030 using improved biomass, LPG, electric cooking, and biogas. • Planning is fragmented and donor-driven, with weak enforcement of technical and environmental standards, and limited sector-wide planning capacity. • The Rural Electrification Fund (FER) is not yet institutionalized, limiting access for vulnerable and remote populations. • Growing share of intermittent renewables (solar/wind) calls for grid flexibility and deployment of battery energy storage systems (BESS). • Low population density and geographic dispersion make rural electrification challenging, requiring decentralized solutions. • SOMELEC faces structural financial stress, including prior years where public transfers reached 3.2% of GDP; tariff subsidy burdens persist. • Private sector participation remains limited, due to lack of implementation of PPP law and incomplete decrees under the 2022 Electricity Code. • \$2.45 billion in financing is still required for Compact implementation, of which \$1.23 billion is expected from the private sector. • Currency risk affects IPP viability, especially fossil-based IPPs; only solar PV IPPs are offered contracts in local currency.
Niger	<ul style="list-style-type: none"> • Electricity access remains one of the lowest in Africa at 20.84%, with the government targeting universal access by 2030 through grid extension, mini-grids, and off-grid solutions. • The power system is fragmented into four unconnected grid zones, served by over 100 diesel-powered mini-grids, leading to inefficiencies. • 71% of electricity is imported from Nigeria, exposing the system to significant external risks.

	<ul style="list-style-type: none"> Local generation is costlier and relies heavily on diesel, accounting for 23% of supply, making imports cheaper by comparison. Transmission capacity is limited, and internal interconnections between zones are lacking, constraining industrial and regional development. The national utility NIGELEC faces financial constraints, with operational inefficiencies and a need for improved cost recovery. Renewables contribute less than 1% of electricity generation; solar PV capacity was 43 MW in 2023, despite high national potential. Only one IPP contract has been signed since 2019, signaling slow private sector participation in electricity generation. A significant investment gap persists, with major financing required for generation, transmission, and access expansion. 94% of households rely on biomass for cooking, contributing to deforestation and poor health outcomes. Security risks and regional instability undermine infrastructure deployment and investor confidence
Nigeria	<ul style="list-style-type: none"> Electricity access stood at 61% in 2022, with over 86 million Nigerians still without access; the government targets universal access by 2030 through grid, mini-grid, and off-grid expansion. Even grid-connected households face unreliable supply, relying heavily on fossil-fueled generators for backup; genset capacity is estimated to be 10 times that of grid supply (~4 GW). Installed generation is 12 GW, but only 46% is available; 75.5% comes from gas, 24.3% from hydro, and 0.3% from solar PV. Nigeria aims to increase the share of renewables from 22% to 50% in the generation mix by 2030. Tariff shortfalls in 2024 are expected to reach ₦2.2 trillion (~\$1.5 billion), with no clear funding source; most subsidies benefit wealthier consumers. Transmission infrastructure is outdated and inadequate, limiting grid stability and capacity for increased supply. \$23 billion is required for last-mile access, of which \$15.5 billion is expected from private sector investment, necessitating an improved enabling environment. Distribution sector suffers from high losses, with ATC&C losses averaging 47% across DISCOs, impacting liquidity and financial stability. The Distribution Sector Recovery Program (DISREP) supports early-stage implementation of DISCOs' Performance Improvement Plans (PIPs), focused on reducing losses, closing the metering gap, and enhancing financial viability. Integration of Distributed Renewable Energy (DRE) faces obstacles including limited access to long-term local currency financing, high import duties, and regulatory complexity. Power utilities, especially GENCOs and DISCOs, face persistent liquidity crises, low remittances, and cost-recovery gaps, creating a vicious cycle of poor service and underinvestment. 1% of Nigerian households have access to clean cooking via electricity, while 10.5% or 7.9 million households use LPG, even as 174 million Nigerians lack access to clean cooking solutions. Nigeria maintains limited regional electricity exports to Benin (200 MW) and Niger (180 MW), but this is constrained by domestic supply and transmission bottlenecks.
Senegal	<ul style="list-style-type: none"> Electricity access stands at 84% (2023), with a goal of universal access by 2029 through a combination of grid, mini-grid, and off-grid solar expansion. Urban access reaches 97.1%, while rural electrification lags at 64.5%, revealing significant geographic disparities. Only 3.1% of households use clean cooking technologies; Senegal targets an 11.3% annual increase to reach full access by 2030. The current share of renewable energy in the generation mix is 29%, with a commitment to reach and maintain 40% by 2030 under the JETP agreement. Grid reliability challenges persist due to aging infrastructure and delayed implementation of electrification projects. Senegal faces a \$6.3 billion financing gap, with \$2.3 billion expected from private investors to meet compact objectives. High production costs and financial pressures on SENELEC require continued subsidy reforms and operational improvements. Regional interconnection programs, including OMVS and the Gambia River basin, aim to strengthen cross-border power trade. Distributed Renewable Energy (DRE) solutions are prioritized, but require policy and financial support to scale effectively. Private sector participation remains critical, especially through IPPs and competitive procurement, but reforms are needed to improve the investment climate and maintain affordable yet cost-reflective tariffs.
Tanzania	<ul style="list-style-type: none"> Electricity connectivity stands at 46% (2022), with a target of 75% by 2030 through grid densification and decentralized solutions. Urban-rural disparity persists, with access at 79% in urban areas versus 36% in rural areas. Over 89% of mainland households and 84% of Zanzibar households rely on firewood and charcoal for cooking. The National Clean Cooking Strategy (NCCS 2024–2034) aims to reach 80% access to modern cooking by 2034, up from 6.9% in 2021.

	<ul style="list-style-type: none"> • As of December 2024, Tanzania's energy mix is dominated by hydropower (59.1%) and natural gas (35.2%); the country plans to add 2,463 MW from solar, wind, gas, and geothermal by 2030. • Transmission and distribution challenges persist, with reliability issues, overloaded transformers, and outdated networks. TANESCO reported 14.2% T&D losses, which are still within acceptable levels. • The compact estimates a total investment need of \$12.9 billion, with \$4.039 billion expected from private sector investors. • TANESCO's financial recovery depends on tariff reforms, performance improvements, and government support. A cost-of-service study is due in 2026 to guide cost-reflective tariff adjustments. • Regional integration is expanding, with Tanzania connected to Kenya, Rwanda, and Burundi, and interconnections with Zambia and Uganda underway. The country also plans to harmonize transmission tariffs with SAPP and EAPP by 2026. • While the Small Power Producer (SPP) framework exists, regulatory unpredictability, risk allocation concerns, and delayed reforms still limit private-sector participation
Zambia	<ul style="list-style-type: none"> • Electricity access is at 53.6%, with rural access at 34.9% and urban at 80.3%, requiring accelerated on-grid and off-grid expansion to meet the 2030 universal access goal. • Clean cooking access is only 8.9%, with a goal of reaching 40% by 2030 through expanded adoption of LPG, ethanol, electricity, and clean stove technologies. • The national energy mix relies heavily on hydropower (83%), creating vulnerability to droughts; the goal is to increase the share of non-hydro renewables from 3% to 33% by 2030. • Transmission and distribution losses are high, requiring modernization, smart metering, and infrastructure upgrades (compact mentions T&D losses but does not specify a percentage). • ZESCO (national utility) is financially constrained, requiring cost-reflective tariffs, improved operational efficiency, and restructuring to enhance service delivery. • Private sector participation is hindered by regulatory uncertainty; streamlined licensing for mini-grids, open access, and stronger frameworks for Independent Power Producers (IPPs) are needed. • Zambia requires \$11.9 billion in energy investment by 2030, of which \$9.5 billion is expected from private sources, demanding robust de-risking strategies and financing partnerships. • Zambia plays a critical role in the Southern African Power Pool (SAPP) but needs transmission infrastructure expansion and tariff harmonization to increase regional power trade. • Aging power infrastructure and growing demand—especially from mining, agriculture, and industry—necessitate substantial capacity expansion across the energy system

2 Methodology

The study follows a structured methodology for extracting, verifying, and summarizing the National Energy Compacts of 12 African countries to ensure accuracy, completeness, and clarity. Each Compact was analyzed to extract policy commitments, investment needs, and reform timelines, systematically categorized under five thematic areas: Institutional Readiness, Regulatory Efficiency, Financial Readiness, Infrastructure & Regional Integration, and Clean Cooking Strategies.

To assess the feasibility of these commitments, a qualitative evaluation framework was applied, assigning each country a rating of Strong, Moderate, or Weak across the five thematic areas. These ratings were determined based on the following criteria:

1. Institutional Readiness: Presence of independent regulators, clear accountability frameworks, and institutional coordination.
2. Regulatory Efficiency: Strength of legal frameworks, tariff structures, and private-sector participation mechanisms.
3. Financial Readiness: Utility financial health, investment de-risking, and cost-recovery mechanisms.
4. Infrastructure & Regional Integration: Grid expansion, cross-border electricity trade, and transmission network reliability.
5. Clean Cooking Strategies: Policy commitments, financial incentives, and infrastructure for scaling up LPG, ethanol, and biomass solutions.

These assessments were informed by peer-reviewed literature, policy reports from the World Bank, AfDB, SEforALL, and national energy agencies, as well as historical case studies on African energy sector reforms. Each country's compact was evaluated based on policy ambition, past implementation success, financial viability, and regulatory structure, ensuring a balanced and evidence-based assessment.

3 Results

The results present a comparative evaluation of the 12 National Energy Compacts, structured through:

Table 2: A summary table synthesizing key policy commitments across the five thematic areas.

Table 3: A policy strength table assessing the feasibility of these commitments and identifying implementation gaps.

The policy strength assessment is based on a structured evaluation framework, incorporating institutional, regulatory, financial, and infrastructural indicators to determine each country's policy implementation capacity. These findings highlight country-specific strengths, weaknesses, and priority areas, forming the basis for deeper analysis in the country-specific sections/related comparative assessment studies.

Table 2 – Summary of key Policy Commitments across 5 Thematic Areas

Country	Institutional Readiness	Regulatory Efficiency & Private Sector Engagement	Financial Readiness & Utility Reform	Infrastructure & Regional Energy Integration Readiness	Clean Cooking Strategies
Chad	<p>Strengthening Energy Institutions:</p> <p>Mobilize \$15 million in public funding to strengthen the institutional capacity of the Ministry of Energy, SNE, and ADERM.</p> <p>Mobilize an additional \$7.5 million to enhance the operational capacity of ARSE to implement and monitor a fair regulatory framework.</p> <p>Establish a comprehensive national monitoring and evaluation framework to track progress on electrification and clean cooking targets.</p>	<p>Energy Procurement & Market Reforms:</p> <p>Adopt a competitive energy procurement framework by 2025, replacing the current ad hoc negotiation-based approach.</p> <p>Finalize a regulatory licensing process for private-sector mini-grids by end-2025, including tariff-setting procedures and grid integration rules.</p> <p>Introduce and enforce predefined quality standards for renewable energy equipment to enhance system reliability and investor confidence.</p>	<p>Investment & Risk Mitigation</p> <p>Mobilize USD 1.95 billion in energy sector investment by 2030, including USD 650.3 million from private sector sources.</p> <p>Expand the use of financial de-risking instruments and partner-supported tools to enhance private participation in off-grid and mini-grid projects.</p> <p>Utility Viability & Revenue Collection</p> <p>Implement SNE’s performance improvement plan to reduce technical and commercial losses to under 15% by 2027.</p> <p>Achieve 100% revenue collection and cost recovery for SNE by 2028, through improved billing and operational efficiency reforms.</p>	<p>Grid & Generation Expansion</p> <p>Expand national electricity generation by 866 MW (520 MW solar, 346 MW thermal) by 2030.</p> <p>Rehabilitate and expand the transmission and distribution network to reduce power losses and improve supply reliability.</p> <p>Regional Integration & Power Trade</p> <p>Complete the 225 kV Chad–Cameroon interconnection, with cross-border electricity flows starting in 2027.</p> <p>Implement harmonized transmission pricing within the Central African Power Pool (CAPP) by 2027 to support regional power trade.</p> <p>Support the development of electrification master plans for secondary cities such as Abéché, Moundou, Sahr, Doba, Bongor, and Faya as part of the Compact’s implementation, building on the existing plan for N’Djamena.</p>	<p>Scaling Up Access</p> <p>Increase clean cooking access to 46% by 2030 through national initiatives and investment mobilization.</p> <p>Develop and adopt a National Clean Cooking Strategy by 2025, outlining clear implementation and coordination mechanisms.</p> <p>Affordability & Supply Chain Development</p> <p>Maintain LPG subsidies and import tax exemptions to ensure affordability of clean cooking technologies.</p> <p>Establish local cookstove supply chains by 2030, expanding manufacturing and distribution networks, with a focus on improving rural access and reducing costs.</p>
	<p>Strengthening Energy Institutions</p> <p>Pursue universal electrification by 2030 through strengthened institutional capacity at MMPE, CI-ENERGIES, and AGER.</p> <p>Establish a national Monitoring & Evaluation framework to track electrification progress, investment</p>	<p>Energy Procurement & Market Reforms</p> <p>Adopt a competitive bidding framework by 2025 for power generation projects to replace direct negotiations with IPPs.</p> <p>Develop a regulatory and licensing framework for mini-grids, enabling</p>	<p>Investment & Risk Mitigation</p> <p>Mobilize USD 15.02 billion in total energy investment, including USD 6.56 billion yet to be secured, with USD 2 billion from the private sector.</p> <p>Deploy risk mitigation instruments, such as guarantees and blended finance, to attract capital for mini-grid and off-grid investment.</p>	<p>Grid & Generation Expansion</p> <p>Expand total generation capacity to 5,128 MW by 2030, including 829 MW from new hydropower projects and 545 MW from solar and biomass sources.</p> <p>Reinforce the transmission and distribution grid in Abidjan and secondary cities to enhance electricity reliability and reduce technical losses.</p>	<p>Scaling Up Access</p> <p>Rural electrification initiatives under PRONER & PEPT to accelerate last-mile connectivity.</p> <p>Electrification of low-income and peri-urban communities through distributed energy solutions.</p>

<p>Côte d'Ivoire</p>	<p>performance, and alignment with compact targets.</p> <p>Enhance regional coordination under WAPP by aligning interconnection and infrastructure development priorities to support electricity trade.</p>	<p>private-sector participation in off-grid electrification.</p> <p>Update the Renewable Energy Action Plan (PANER) by 2025, aligning with the 45% renewable energy target and identifying priority investment areas.</p> <p>Provide incentives for IPPs, including tariff structure reforms and streamlined project approval procedures to attract private investment.</p>	<p>Initiate annual financial audits starting in 2025 to strengthen transparency and investor confidence.</p> <p>Utility Viability & Revenue Collection</p> <p>Implement CI-ENERGIES' financial recovery plan to achieve full cost recovery by 2028, including technical and commercial loss reduction to under 15%.</p> <p>Improve billing and revenue collection systems to enhance financial performance and reduce fiscal dependency.</p>	<p>Regional Integration & Power Trade</p> <p>Expand the 330 kV interconnection with Burkina Faso to strengthen regional grid integration.</p> <p>Develop the 225 kV Côte d'Ivoire–Liberia interconnection to facilitate cross-border power trade.</p> <p>Increase electricity exports by 115%, reaching 2,268 GWh annually by 2030, under the WAPP regional integration framework.</p>	<p>Affordability & Supply Chain Development</p> <p>50% clean cooking access by 2030, backed by a National Clean Cooking Strategy (by 2025).</p> <p>Expansion of LPG distribution networks and improved high-efficiency biomass cookstoves.</p> <p>Tax exemptions on clean cooking equipment and butane subsidies to support affordability.</p> <p>Development of local clean cooking supply chains to improve access and reduce costs.</p>
<p>Democratic Republic of the Congo (DRC)</p>	<p>Strengthening Energy Institutions</p> <p>Expand electricity access from 21.5% to 62% by 2030, using a mix of grid extension and off-grid solutions.</p> <p>Establish a second public electricity company by 2027, focused on transmission, to reduce SNEL's dominance and increase competition.</p> <p>Adopt a consolidated monitoring and evaluation program to track progress on electricity and clean cooking access using the Multi-Tier Framework (MTF).</p> <p>Clarify institutional mandates and align implementation of the 2014 Electricity Law to strengthen regulation and enable private-sector engagement.</p>	<p>Energy Procurement & Market Reforms</p> <p>Clarify and implement the 2014 Electricity Law and tariff frameworks to streamline private investment and reduce institutional overlap.</p> <p>Develop transparent procurement and IPP frameworks to improve investor confidence and reduce reliance on direct negotiations.</p> <p>Establish a licensing and regulatory framework for mini-grids and off-grid electrification, including technical standards and tariff rules.</p> <p>Create a one-stop shop for renewable energy project approvals to accelerate permitting and simplify administrative procedures.</p> <p>Adopt a National Clean Cooking Strategy by 2025 to guide and coordinate clean cooking policies and investments.</p>	<p>Investment & Risk Mitigation</p> <p>Mobilize USD 37 billion in total energy investment by 2030, including USD 17 billion from public sources and USD 20 billion from private investors.</p> <p>Expand the Results-Based Financing (RBF) Mwindu Fund from USD 500 million to USD 1 billion to support mini-grids, clean cooking, and solar deployment.</p> <p>Introduce a USD 200 million revolving credit line to finance decentralized renewable energy systems, productive uses of energy, and institutional electrification.</p> <p>Deploy de-risking instruments, including loan guarantees, blended finance, and risk-sharing facilities, to attract and protect private capital.</p> <p>Utility Viability & Revenue Collection</p> <p>Implement SNEL's financial recovery plan, including debt restructuring, cost</p>	<p>Grid & Generation Expansion</p> <p>Increase generation capacity from 3,067 MW to 13,576 MW by 2030, including 4,000 MW from solar and expanded hydropower from Grand Inga and other projects.</p> <p>Boost electricity production from 15,261 GWh to 65,000 GWh by 2030, improving supply reliability.</p> <p>Upgrade national transmission infrastructure to reduce energy losses and extend grid coverage across underserved provinces.</p> <p>Regional Integration & Power Trade</p> <p>Develop the Inga Transmission System to enable stable electricity exports to Southern Africa.</p> <p>Complete the 220 kV DRC–Zambia interconnection by 2027 to strengthen DRC's participation in the SAPP.</p>	<p>Scaling Up Access</p> <p>Increase clean cooking access from 1% to 30% by 2030, benefiting 40 million people.</p> <p>Develop a National Clean Cooking Strategy by 2025 to guide coordinated policy implementation.</p> <p>Introduce financial support mechanisms for clean cooking enterprises, including grants and subsidies to expand access.</p> <p>Affordability & Supply Chain Development</p> <p>Eliminate import duties and taxes on clean cooking technologies to lower costs for households and businesses.</p> <p>Expand LPG distribution networks and provide incentives for improved biomass cookstoves to reduce charcoal dependency.</p>

			<p>optimization, and infrastructure upgrades.</p> <p>Install prepaid meters and roll out a national metering and digitalization policy to enhance billing efficiency and revenue collection.</p> <p>Reduce technical and commercial losses from 46% to 15% by 2030 through a structured loss-reduction strategy across the national grid.</p>	<p>Advance the Bunia–Inga transmission corridor to support trade with EAPP countries.</p> <p>Sign intergovernmental agreements to ensure stable power exports and reinforce DRC’s position in regional power markets.</p>	<p>Support local manufacturing and distribution of clean cookstoves to build resilient supply chains.</p> <p>Implement targeted LPG subsidies to improve affordability for low-income and vulnerable households.</p>
Liberia	<p>Strengthening Energy Institutions</p> <p>Expand electricity access from 32.7% to 75% by 2030, using a combination of grid expansion and off-grid deployment.</p> <p>Strengthen the National Energy Programming Unit (NEPU) to coordinate activities across energy institutions and ensure periodic progress reviews.</p> <p>Update the national five-year electrification plan and implement a monitoring system to track progress on electricity access.</p> <p>Strengthen and adequately resource the Rural and Renewable Energy Agency (RREA) to accelerate implementation of mini-grid and off-grid solutions, especially in underserved communities.</p>	<p>Energy Procurement & Market Reforms</p> <p>Implement the mini-grid licensing framework and tariff guidelines to ensure regulatory certainty for off-grid operators.</p> <p>Enhance energy sector policy frameworks to facilitate private-sector participation in infrastructure development.</p> <p>Promote transparency and consistency in procurement and licensing to build investor confidence.</p> <p>Strengthen investor outreach and expand access to finance through donor-supported renewable energy initiatives.</p> <p>Adopt a National Clean Cooking Strategy with an action plan by 2026, setting clear targets for LPG, improved biomass, and biogas technologies.</p>	<p>Investment & Risk Mitigation</p> <p>Mobilize USD 1.25 billion in total investment by 2030, including USD 150 million from private-sector partners.</p> <p>Expand innovative financing tools and de-risking mechanisms to unlock private investment in off-grid and mini-grid markets.</p> <p>Promote access to affordable finance for renewable energy deployment through public and donor-backed programs.</p> <p>Utility Viability & Revenue Collection</p> <p>Enhance LEC’s financial sustainability through smart metering, debt repayment strategies, and regular financial audits.</p> <p>Reduce system losses through infrastructure rehabilitation and billing improvements, supporting better cost recovery and grid reliability.</p>	<p>Grid & Generation Expansion</p> <p>Upgrade transmission and distribution infrastructure, including rehabilitation of substations and high-voltage lines.</p> <p>Expand electricity generation capacity beyond the current 126 MW through new solar and hydro projects, including 90 MW of utility-scale solar PV and over 200 MW in new hydropower development.</p> <p>Modernize grid infrastructure to improve energy dispatch, system reliability, and service quality.</p> <p>Regional Integration & Power Trade</p> <p>Operationalize the Côte d’Ivoire–Liberia 225 kV interconnection to secure low-cost electricity imports and stabilize supply.</p> <p>Strengthen Liberia’s integration into the West African Power Pool (WAPP) to expand regional energy trade and improve energy security.</p>	<p>Scaling Up Access</p> <p>Develop and adopt a national clean cooking strategy by 2026, setting access targets and scaling solutions for both rural and urban households.</p> <p>Expand LPG access and distribution through targeted infrastructure investments and supply chain improvements.</p> <p>Affordability & Supply Chain Development</p> <p>Support the development of clean cooking supply chains to reduce costs and improve availability.</p> <p>Implement public awareness and education campaigns to promote clean cooking adoption and behavior change.</p>

<p>Madagascar</p>	<p>Strengthening Energy Institutions</p> <p>Target 80% electrification by 2030, up from 36%, using grid densification, mini-grids, and off-grid solar.</p> <p>Activate and operationalize the Electricity Regulatory Authority (ARELEC), completing its transition from the existing Office de Régulation de l'Électricité (ORE), and separating regulatory oversight from JIRAMA's commercial functions.</p> <p>Adopt the decree for the least-cost development plan (PDMC) to guide transparent project selection and institutional coordination.</p> <p>Establish a regulatory monitoring roadmap for the performance of JIRAMA (Jiro sy Rano Malagasy – the national utility) by June 2025.</p> <p>Strengthen institutional capacity at JIRAMA, the Agence de Développement de l'Électrification Rurale (ADER), and ORE, through targeted reforms and capacity-building support.</p> <p>Develop a national geospatial electrification planning platform to guide investment and track electrification and clean cooking progress.</p>	<p>Energy Procurement & Market Reforms</p> <p>Adopt a standard concession contract for large mini-grids by end of 2025.</p> <p>Develop a simplified examination procedure and approval for mini-networks by end of 2025.</p> <p>Define and implement risk mitigation mechanisms to incentivize private sector investment by end of 2026.</p> <p>Establish a dedicated unit within MEH Planning Department in 2025 to monitor on-grid, off-grid, mini-grid, and clean cooking access.</p> <p>Create an online platform by 2026 to update the electrification strategy and indicate private sector opportunities.</p> <p>Implement the “Scaling Mini Grid” approach by 2026 with large-scale tenders for private mini-grids.</p> <p>Implement by December 2025 the framework in decree 2023-245 for calls for tenders and unsolicited offers.</p>	<p>Investment & Risk Mitigation</p> <p>Mobilize \$7.2 billion by 2030, with 60% from the private sector and 40% from the Government and development partners.</p> <p>Increase Results-Based Fund to \$1.4 billion by 2030 to unlock \$1.9 billion in private investment.</p> <p>Define and implement risk mitigation mechanisms by 2026 to attract private sector participation.</p> <p>Utility Viability & Revenue Collection</p> <p>Support JIRAMA's recovery plan and adopt a strategy to tackle its debt.</p> <p>Regularly publish JIRAMA's audited financial statements within 30 days of board approval.</p> <p>Operationalize SCADA by 2026 and reduce technical losses to 5% and commercial losses to below 10% by 2030.</p> <p>Increase JIRAMA's collection rate to over 90% by 2030.</p> <p>Implement tariff reforms, including indexation, to ensure cost recovery by 2030.</p>	<p>Grid & Generation Expansion</p> <p>Reach 893 MW of renewable energy capacity by 2030, with 560 MW solar added by 2028.</p> <p>Continue hybridizing thermally isolated centers and support new renewable generation with private sector collaboration.</p> <p>Adopt by 2025 a national plan for the production and development of electricity networks integrating the updated PDMC.</p> <p>Prepare sector-specific reports to guide transmission and distribution investments.</p> <p>Regional Integration & Power Trade</p> <p>Commit to harnessing the benefits of increased regional integration as outlined under Pillar II.</p> <p>Use the National Electrification Strategy to identify investment opportunities, including infrastructure upgrades.</p>	<p>Scaling Up Access</p> <p>Increase access to improved and clean cooking solutions to 50% of the population by 2030.</p> <p>Affordability & Supply Chain Development</p> <p>Eliminate import duties on clean cooking technologies or cover required duties until 2030.</p> <p>Simplify implementation of the current policy and publish online the list of exempt equipment.</p> <p>Implement a simplified and accelerated process by 2025 to provide letters of authorization to clean cooking providers.</p>
	<p>Strengthening Energy Institutions</p> <p>Increase electricity access from 25.9% to 70% by 2031 through 1.15 million on-grid and 1.55 million off-grid connections, using grid densification, solar home systems, and mini-grids.</p> <p>Strengthen regulatory capacity of MERA to improve independent tariff</p>	<p>Energy Procurement & Market Reforms</p> <p>Review and update the IPP Framework and standard Power Purchase Agreement (PPA) to reflect market realities and expedite project approvals.</p>	<p>Investment & Risk Mitigation</p> <p>Mobilize approximately USD 5.5 billion by 2030 to achieve national energy access goals, with USD 530.8 million already secured.</p>	<p>Grid & Generation Expansion</p> <p>Add 848 MW of new generation capacity by 2030, with 714 MW expected from private sector investments.</p> <p>Upgrade transmission and distribution infrastructure to improve reliability and reduce losses.</p>	<p>Scaling Up Access</p> <p>Increase clean cooking access from 2% to 75% by 2030, with a focus on improved cookstoves, LPG, biogas, and electric cooking.</p>

<p>Malawi</p>	<p>setting and promote private sector confidence.</p> <p>Establish a national electrification monitoring platform to track the real-time progress of electricity access activities (grid connections, mini-grids, and off-grid solar).</p> <p>Unbundle transmission and distribution from ESCOM to improve efficiency.</p> <p>Strengthen institutional coordination among the Ministry of Energy, ESCOM, MERA, and local governments.</p>	<p>Update the permitting process to improve efficiency and accommodate renewable energy auctions.</p> <p>Develop and operationalize a risk mitigation facility to attract private investment in mini-grids and IPPs.</p>	<p>Develop and operationalize a risk mitigation facility to attract private investments in mini-grids and IPPs.</p> <p>Promote innovative financing mechanisms, including carbon finance-based models, to support clean cooking adoption.</p> <p>Utility Viability & Revenue Collection</p> <p>Support ESCOM’s financial recovery and reform program.</p> <p>Address high grid losses caused by aging infrastructure and underinvestment.</p> <p>Improve tariff structures to ensure cost-reflectivity while protecting the poor.</p>	<p>Regional Integration & Power Trade</p> <p>Operationalize the Mozambique–Malawi 400 kV interconnector by 2027.</p> <p>Advance the Zambia–Malawi interconnector, with feasibility studies underway.</p> <p>Plan for the Tanzania–Malawi interconnector, targeted for implementation by 2030.</p>	<p>Affordability & Supply Chain Development</p> <p>Support local production and distribution of improved cookstoves and clean cooking fuels.</p> <p>Promote innovative financing mechanisms, such as carbon finance-based models, to enhance affordability and sustainability.</p>
<p>Mauritania</p>	<p>Strengthening Energy Institutions</p> <p>Increase electricity access from 55% to 100% by 2030 through grid densification, mini-grids, and stand-alone solar systems.</p> <p>Strengthen the Electricity Sector Regulatory Authority (ARE) to regulate tariffs, grid access, and service quality.</p> <p>Support reforms to improve SOMELEC’s cost recovery, service quality, and accountability.</p>	<p>Energy Procurement & Market Reforms</p> <p>Ensure full implementation and enforcement of the now-operational 2022 Electricity Code, following the 2024 decrees and regulatory orders.</p> <p>Apply revised PPP Law provisions to strengthen the investment framework for private energy developers.</p> <p>Launch competitive and transparent tenders for renewable energy projects such as solar and wind.</p> <p>Develop clear rules and permitting procedures to accelerate IPP project implementation.</p> <p>Address past regulatory delays to expand private sector participation in electricity generation and access.</p>	<p>Investment & Risk Mitigation</p> <p>Mobilize an additional \$2.45 billion in financing, including \$1.23 billion from private sector investments.</p> <p>Increase Results-Based Financing (RBF) for mini-grids, off-grid solar, clean cooking, and public institution electrification to unlock private capital.</p> <p>Utility Viability & Revenue Collection</p> <p>Support reforms to improve SOMELEC’s cost recovery, service quality, and accountability.</p> <p>Reduce technical, commercial, and collection losses to improve financial performance and system efficiency.</p> <p>Move toward cost-reflective tariffs while maintaining affordability for vulnerable consumers.</p>	<p>Grid & Generation Expansion</p> <p>Prioritize investments in national and regional transmission infrastructure to improve reliability and service quality.</p> <p>Expand medium- and low-voltage networks to reach underserved areas and reduce technical losses.</p> <p>Regional Integration & Power Trade</p> <p>Strengthen regional electricity trade through the 225 kV Nouakchott–Tobène interconnection with Senegal.</p> <p>Enhance integration into the OMVS system and support expanded collaboration with the West African Power Pool (WAPP).</p> <p>Extend the 225 kV and 90 kV high-voltage networks to serve more than 500 localities across Mauritania.</p>	<p>Scaling Up Access</p> <p>Increase clean cooking access from 4% to 54% by 2030 using improved cookstoves, LPG (butane), electric cooking, and biogas.</p> <p>Affordability & Supply Chain Development</p> <p>Promote local manufacturing and distribution of clean cooking equipment.</p> <p>Finalize and implement a National Clean Cooking Strategy by 2025 to guide technology adoption and investment priorities.</p>

<p>Niger</p>	<p>Strengthening Energy Institutions</p> <p>Expand electricity access from 20.84% to universal coverage by 2030 using grid, mini-grid, and off-grid solutions.</p> <p>Adopt a financial viability plan for NIGELEC by 2025 to reduce operational losses and improve sustainability.</p> <p>Strengthen the energy information system (SIE-NIGER) to ensure timely tracking of sector developments.</p> <p>Establish a high-level inter-ministerial steering committee to enhance coordination and project oversight.</p>	<p>Energy Procurement & Market Reforms</p> <p>Adopt a new electricity code in 2025, integrating the regulatory framework for off-grid and clean cooking solutions, along with implementing decrees.</p> <p>Establish a competitive procurement framework for renewable energy to promote transparent and cost-effective project selection.</p> <p>Support regulatory clarity for Independent Power Producers (IPPs) to improve implementation timelines and investor confidence.</p> <p>Provide financial support mechanisms to de-risk private-sector-led renewable energy and clean cooking initiatives.</p>	<p>Investment & Risk Mitigation</p> <p>Mobilize private investment to reduce pressure on public finances and expand renewable energy capacity.</p> <p>Strengthen sector financial viability to increase participation by Independent Power Producers (IPPs).</p> <p>Utility Viability & Revenue Collection</p> <p>Adopt a financial viability plan for NIGELEC by 2025 to reduce operational losses and ensure a sustainable debt level.</p> <p>Restore electricity tariffs to ensure cost recovery as part of the 2025 plan, balancing sustainability with possible government subsidies.</p> <p>Improve cost transparency and reduce technical and commercial losses through utility performance reforms.</p> <p>Reinforce accountability through enhanced reporting and financial oversight mechanisms.</p>	<p>Grid & Generation Expansion</p> <p>Expand generation capacity through large-scale projects such as the 130 MW Kandadji hydropower plant, and hybrid mini-grids in underserved regions.</p> <p>Interconnect Niger’s fragmented grid zones by constructing 132 kV and 330 kV transmission lines, enhancing reliability and reducing losses.</p> <p>Regional Integration & Power Trade</p> <p>Advance the Northern Dorsal Interconnection Project (Nigeria–Niger–Benin–Burkina Faso) with 330 kV infrastructure to strengthen power trade under WAPP.</p> <p>Commit to adopting a regional transmission tariff in 2025, supporting market integration and regional cooperation</p>	<p>Scaling Up Access</p> <p>Increase clean cooking access to 12% by 2030, with an annual growth rate of 1%</p> <p>Target deployment of clean cooking solutions through both public and private investments, including LPG, charcoal briquettes, and solar cookers.</p> <p>Affordability & Supply Chain Development</p> <p>Develop 2 charcoal briquette production factories with a capacity of 150,000 tons/year, lowering household fuel costs and reducing deforestation</p> <p>Establish LPG cylinder manufacturing units and 63 filling stations across all regions of the country</p> <p>Expand solar cooker production in partnership with ANERSOL.</p> <p>Commit to financial support mechanisms to ensure affordability for clean cooking technologies.</p>
<p>Nigeria</p>	<p>Strengthening Energy Institutions</p> <p>Nigeria aims to expand electricity access from 61% to universal coverage by 2030 using grid, mini-grid, and off-grid systems.</p> <p>The Electricity Act 2023 shifts end-user regulation to states while NERC retains oversight of transmission and market rules.</p> <p>TCN will be unbundled into an Independent System Operator and a Transmission Service Provider, with implementation expected by 2025.</p>	<p>Energy Procurement & Market Reforms</p> <p>Implement the Electricity Act (2023), which decentralizes electricity regulation and enables states to establish their own procurement frameworks.</p> <p>Support states to develop competitive procurement policies for renewable energy, aligned with least-cost planning.</p> <p>Streamline mini-grid regulations further by expanding licensing thresholds, enabling batch</p>	<p>Investment & Risk Mitigation</p> <p>Nigeria requires \$23 billion in energy investments, with \$7.7 billion from public sources and \$15.5 billion expected from private investors.</p> <p>Financing support is provided through initiatives like the Distribution Sector Recovery Program (DISREP), which funds early-stage implementation of DISCOs’ Performance Improvement Plans (PIPs) to reduce losses and attract private capital.</p>	<p>Grid & Generation Expansion</p> <p>Increase transmission wheeling capacity by 2,000 MW through Phase I of the Transmission Expansion Plan by 2026.</p> <p>Modernize and upgrade TCN’s aging infrastructure to improve efficiency and reduce grid losses.</p> <p>Scale up renewable generation with support from programs like Empower Nigeria (targeting 2,500–3,000 MW) and Solar for Health.</p> <p>Regional Integration & Power Trade</p>	<p>Scaling Up Access</p> <p>Expand clean cooking access to reach 100% by 2030, benefiting approximately 227 million Nigerians, with a focus on women and marginalized groups.</p> <p>Prioritize deployment of LPG and electric cooking solutions, aligned with national clean cooking objectives.</p> <p>Affordability & Supply Chain Development</p> <p>Promote local production of improved cookstoves, especially through women-</p>

	<p>The Ministry of Power sets electrification policy, while REA leads off-grid expansion for rural and underserved communities.</p> <p>A new national electricity policy and strategic plan (NIEP-SIP) will be finalized by 2025 to guide electrification efforts.</p>	<p>processing, and improving tariff clarity to scale up private-sector electrification.</p> <p>Strengthen regulatory clarity to enhance investor confidence and reduce delays in Independent Power Producer (IPP) implementation.</p> <p>Address financial barriers to private investment through supportive policies and institutional reforms, though specific de-risking tools are not yet defined.</p>	<p>Utility Viability & Revenue Collection</p> <p>ATC&C losses across DISCOs average 47%, undermining financial sustainability; PIPs are being enforced to reduce these losses.</p> <p>A government-approved metering plan (2025–2027) will close the metering gap through updated codes and annual financing commitments.</p> <p>The government is fast-tracking a mass-metering program and deploying management information systems (MIS) to improve billing, collection, and grid reliability.</p> <p>Periodic tariff adjustments are underway based on macroeconomic variables, with a goal of reaching full cost reflectivity after 2027, except for lifeline tariffs for low-income users.</p> <p>A Power Sector Debt Resolution Scheme will be introduced in 2025 to address GENCO and DISCO arrears owed by the federal government.</p>	<p>Deepen existing electricity export arrangements to Niger and Benin, building on longstanding bilateral agreements.</p> <p>Address domestic supply constraints and network bottlenecks to boost Nigeria’s regional trade potential.</p>	<p>and youth-led enterprises engaged in energy access and productive use.</p>
<p>Senegal</p>	<p>Strengthening Energy Institutions</p> <p>Senegal targets universal access to electricity by 2029, a goal embedded in the forthcoming Energy Sector Development Policy Letter (LPDSE) 2024–2028.</p> <p>The Energy Information System (EIS) is actively used by the Ministry of Energy for routine monitoring of electricity access, though it currently does not cover clean cooking.</p> <p>The compact calls for reforms at SENELEC, including operational efficiency improvements and reduction</p>	<p>Regulatory Efficiency & Private Sector Engagement</p> <p>Implement regulatory reforms to reinforce Law No. 2021-31 (Electricity Code) and its decrees, enabling increased private-sector investment in mini-grids and self-production.</p> <p>Enforce Decree No. 2023-444, limiting the use of direct agreements and promoting competitive procurement for IPP projects.</p> <p>Accelerate the digitalization of procurement processes, reducing</p>	<p>Investment & Risk Mitigation</p> <p>Mobilize \$6.3 billion in energy sector investment, with \$2.3 billion expected from the private sector.</p> <p>Develop innovative financing mechanisms with guarantees and risk reduction tools to attract private capital.</p> <p>Utility Viability & Revenue Collection</p> <p>Improve SENELEC’s financial sustainability by phasing out subsidies, linking compensation to cost recovery, and implementing a debt and arrears reduction strategy.</p>	<p>Grid & Generation Expansion</p> <p>Senegal plans to increase renewable energy’s share to 40% by 2030 under the JETP framework.</p> <p>The compact highlights modernization of transmission/distribution networks, including rural and peri-urban connections.</p> <p>Regional Integration & Power Trade</p> <p>Senegal is integrated into the OMVG (Gambia River Development Organization) and OMVS, as well as WAPP, with ongoing expansion of 225</p>	<p>Scaling Up Access</p> <p>Increase clean cooking access from 3.1% to universal coverage by 2030, requiring an annual access growth rate of 11.3%.</p> <p>Expand the availability of LPG and ethanol-based fuels, while continuing butane subsidies and exploring local fuel production options.</p> <p>Affordability & Supply Chain Development</p> <p>Support local stove artisans to meet rising demand for improved biomass</p>

	<p>of production costs, to strengthen its financial sustainability.</p> <p>The Electricity Sector Regulatory Commission (CRSE) is actively engaged in sector oversight, including participation in ECOWAS tariff coordination and public consultation on transmission pricing.</p> <p>The compact also notes the need for improved coordination between government agencies involved in electrification to optimize technical and financial resources</p>	<p>delays in contract execution and permitting.</p> <p>Promote public-private partnerships (PPP) for renewable energy projects, including through public financing awarded to selected developers by ASER.</p> <p>Continue regulatory efforts to improve transparency, risk-sharing, and investment incentives, particularly in renewables.</p>	<p>Maintain annual financial audits of SENELEC to strengthen transparency.</p> <p>Introduce a cash cascade mechanism to stabilize payments across the electricity value chain.</p>	<p>kV interconnections with Mali and The Gambia.</p> <p>The Integrated Low-Cost Electrification Plan (PIMC), due in 2025, will optimize access to renewable zones and planning of generation, transmission, and distribution.</p>	<p>cookstoves, enhancing domestic production capacity.</p> <p>Develop a new Clean Cooking Strategy (2024–2030) to guide implementation and align with national electrification goals.</p>
Tanzania	<p>Strengthening Energy Institutions</p> <p>Increase electricity access from 46% to 75% by 2030, focusing on last-mile grid connections, mini-grids, and DRE systems.</p> <p>Strengthen EWURA’s regulatory oversight and enforcement capacity for better performance monitoring and tariff implementation.</p> <p>Implement a structured monitoring and evaluation framework, enabling data-driven energy policy adjustments.</p> <p>Roll out performance improvement plans at TANESCO to enhance financial management, operational transparency, and service reliability.</p> <p>Build institutional capacity and improve coordination between the Ministry of Energy, TANESCO, REA, and EWURA.</p>	<p>Regulatory Efficiency & Private Sector Engagement</p> <p>Revise the Small Power Producers (SPP) framework by 2026 to enable cost-reflective tariffs and facilitate private-sector investment in distributed renewable energy (DRE).</p> <p>Streamline permitting and licensing processes for small-scale IPPs and mini-grids, building on the 2020 SPP Rules.</p> <p>Operationalize the Renewable Energy Investment Facility by 2025 to support access to innovative financing and risk mitigation.</p> <p>Adopt and implement the National Clean Cooking Strategy (2024–2034) and its Action Plan, focusing on LPG, ethanol, and improved biomass solutions.</p> <p>Strengthen PPP frameworks across the energy sector and retain transaction advisors to support project financing and closure.</p>	<p>Investment & Risk Mitigation</p> <p>Tanzania aims to mobilize USD 12.89 billion in energy investments by 2030, including USD 8.85 billion from public sources and USD 4.04 billion from private investors.</p> <p>The government commits to developing innovative financing mechanisms and guarantee facilities to unlock private capital, particularly for DRE and clean cooking.</p> <p>Carbon-financing and results-based financing (RBF) are mentioned as important tools to support off-grid service providers.</p> <p>Utility Viability & Revenue Collection</p> <p>TANESCO’s financial recovery is being pursued through strategic actions including:</p> <ul style="list-style-type: none"> Debt-to-equity conversion (TZS 2.8 trillion as of 2023) to improve its solvency. 	<p>Grid & Generation Expansion</p> <p>Add approximately 1,973 MW of new generation capacity by 2030, including 880 MW hydro, 463 MW solar, 500 MW wind, and 130 MW geothermal, requiring an estimated \$4.12 billion in investment.</p> <p>Expand the transmission network to support grid reliability, particularly in regions like Arusha, Dodoma, Mbeya, and Mwanza, through construction and upgrading of substations, new transmission lines, and distribution systems.</p> <p>Regional Integration & Power Trade</p> <p>Tanzania is strengthening regional interconnections, including with Kenya (commissioned 2024), Zambia (completion by 2027), Uganda (preparation ongoing), and Mozambique/Malawi/DRC (concept stage).</p> <p>Interconnection capacity with neighboring countries is expected to reach 1.5 GW by 2028, supporting</p>	<p>Scaling Up Access</p> <p>Increase clean cooking access to 80% by 2034, with a focus on LPG, e-cooking, and improved cookstoves.</p> <p>Scale implementation through the National Clean Cooking Strategy (NCCS 2024–2034), launched in May 2024, promoting natural gas, ethanol, briquettes, biogas, and electric cooking options.</p> <p>Affordability & Supply Chain Development</p> <p>Implement a 50% subsidy on LPG starter packs for rural households and a 75% subsidy on improved cookstoves, distributed under the World Bank–financed TREP Program.</p> <p>Support local production of charcoal briquettes and capacity-building for manufacturers and prison staff on clean cooking energy solutions.</p> <p>Promote behavioral change through awareness campaigns, enabling a shift</p>

			<ul style="list-style-type: none"> Annual financial audits, which are published by the Controller and Auditor General. <p>A cost-of-service study will be completed by June 2026 to determine cost-recovery rates, with annual tariff adjustments to begin in 2027, ensuring affordability for poor and vulnerable groups.</p> <p>Performance improvement plans for TANESCO and ZECO will be approved by the regulator by 2026, and tracked annually starting 2027, to enhance transparency, efficiency, and service delivery.</p>	<p>Tanzania’s entry into both the East African and Southern African Power Pools (EAPP and SAPP).</p> <p>These efforts are expected to improve reliability, reduce reserve requirements, and position Tanzania as a regional energy hub.</p>	<p>away from biomass dependency to cleaner fuels</p>
Zambia	<p>Strengthening Energy Institutions</p> <p>Increase electricity access from 53.6% to universal coverage by 2030 through grid, mini-grid, and off-grid expansion.</p> <p>Strengthen the Energy Regulation Board (ERB) to ensure transparent tariff regulation and licensing.</p> <p>Establish robust data and planning systems to track electrification and clean cooking progress.</p> <p>Implement financial and operational reforms at ZESCO, aligned with the 2022–2031 Strategic Plan.</p> <p>Promote institutional coordination to support service delivery and unlock investments.</p>	<p>Energy Procurement & Market Reforms</p> <p>Implement the single licensing system to streamline IPP permitting.</p> <p>Enforce the Open-Access, Net-Metering, and System Market Operator policies to attract investment.</p> <p>Leverage the Integrated Resource Plan (IRP) to guide private-sector participation across the energy value chain.</p> <p>Develop a National Clean Cooking Strategy by 2025 to support private-sector involvement in LPG, ethanol, and electric cooking.</p> <p>Expand PPP and concession models for generation, transmission, and distribution projects.</p>	<p>Investment & Risk Mitigation</p> <p>Mobilize \$11.9 billion in total investment by 2030, including \$9.5 billion from private investors and \$2.4 billion from public sources.</p> <p>Expand Results-Based Financing (RBF) and viability gap funding for off-grid and clean cooking solutions.</p> <p>Utility Viability & Revenue Collection</p> <p>Implement ZESCO’s recovery strategy, including tariff reforms, debt restructuring, and operational efficiency improvements to reach full cost recovery by 2027.</p> <p>Introduce smart metering, improve billing collection systems, and publish annual audits to build investor confidence</p>	<p>Grid & Generation Expansion</p> <p>Expand generation capacity by 6,200 MW by 2030, including solar, wind, biomass, and geothermal.</p> <p>Increase the share of non-hydro renewables to 33% to reduce hydrological risk.</p> <p>Upgrade transmission lines from 12,705 km to 17,913 km by 2030 and invest nearly \$1B in distribution improvements</p> <p>Implement the Integrated Resource Plan (IRP) and geospatial electrification mapping to guide national grid expansion</p> <p>Regional Integration & Power Trade</p> <p>Strengthen regional interconnection with the DRC via a 330 kV, 700 MW cross-border transmission line, enhancing electricity trade with SAPP and supplying power to the Katanga mining region</p>	<p>Scaling Up Access</p> <p>Target: Raise clean cooking access from 8.9% to 40% by 2030.</p> <p>Expand LPG distribution and develop biogas, ethanol, and electric cooking alternatives</p> <p>Implement Results-Based Financing (RBF) to lower the cost of clean cooking technologies for low-income households</p> <p>Affordability & Supply Chain Development</p> <p>Introduce tax exemptions and duty relief on clean cooking components and fuels</p> <p>Strengthen microfinance institutions (MFIs) to offer credit to rural households for clean cooking purchases; as well as support consumer education and awareness initiatives to improve adoption of clean cooking solutions</p>

Table 3 – Policy Strength Table

Country	Institutional Readiness	Regulatory Efficiency & Private Sector Engagement	Financial Readiness & Utility Reform	Infrastructure & Regional Energy Integration Readiness	Clean Cooking Strategies
Chad	Weak	Weak	Weak	Moderate	Weak
Côte d'Ivoire	Strong	Strong	Moderate	Strong	Moderate
Democratic Republic of the Congo (DRC)	Moderate	Weak	Weak	Moderate	Weak
Liberia	Moderate	Moderate	Weak	Moderate	Weak
Madagascar	Moderate	Moderate	Moderate	Moderate	Moderate
Malawi	Moderate	Moderate	Moderate	Moderate	Weak
Mauritania	Strong	Moderate	Moderate	Moderate	Moderate
Niger	Moderate	Moderate	Moderate	Moderate	Weak
Nigeria	Strong	Strong	Moderate	Strong	Moderate
Senegal	Strong	Moderate	Moderate	Strong	Weak
Tanzania	Moderate	Moderate	Moderate	Moderate	Moderate
Zambia	Weak	Moderate	Weak	Moderate	Weak

- Strong** – Clear policies with active implementation and strong institutional commitment.
- Moderate** – Policies exist but face implementation barriers or require further development.
- Weak** – Policies are underdeveloped or require major reforms.

4.0 Country Specific Analysis

4.1 Chad

Institutional Readiness – Weak

Chad's power sector remains fragmented, with no independent regulatory body overseeing the electricity market's operations. The Ministry of Petroleum and Energy (MPE) maintains overarching control over sector policies, while the Société Nationale d'Électricité (SNE) is responsible for power generation and distribution. However, SNE faces significant financial deficits and operational inefficiencies, which constrain the expansion of electrification. The absence of an independent regulatory authority weakens tariff enforcement and undermines private-sector confidence, thereby limiting investment opportunities (Bobio et al, 2024).

The National Energy Compact outlines capacity-building initiatives for SNE and regulatory reforms aimed at attracting investment. However, decision-making remains highly centralized within the ministry, which lacks the technical expertise to manage large-scale electrification projects. Furthermore, Chad does not have a structured policy framework for decentralizing energy governance, posing additional challenges to rural electrification efforts (Goldthau, 2014; Utoh et al, 2024). These obstacles are not unique to Chad; similar issues within state-controlled electricity markets have slowed electrification progress across Africa (Mostert et al, 2021; Juta, 2024).

To address these challenges, Chad must prioritize the operationalization and strengthening of its existing energy regulatory body, ARSE, to enhance market transparency, enforce tariff structures, and bolster investor confidence. Financial restructuring efforts—such as reducing technical and non-technical losses to below 15% by 2027 and improving SNE's billing and recovery systems—are already planned under the Compact. Strengthening coordination between the Ministry of Energy and SNE, alongside regional integration efforts such as the planned interconnection with Cameroon and harmonized transmission pricing within *Pool Énergétique de l'Afrique Centrale* (PEAC), that is the Central African Power Pool could further facilitate rural electrification. These recommendations are consistent with broader findings on the role of institutional coordination and regional frameworks in advancing electrification across African states (Njoh et al., 2019; Adelaja, 2020).

Regulatory Efficiency & Private Sector Engagement – Weak

Chad scores weak on regulatory efficiency and private-sector engagement, reflecting the absence of a fully developed framework for Independent Power Producers (IPPs) and the continued dominance of centralized, non-transparent decision-making processes.

At present, private power producers operate under Memoranda of Understanding (MoUs) with the Ministry of Energy and enter into bilateral purchase agreements with the Société Nationale d'Électricité (SNE). These arrangements bypass competitive procurement and lack regulatory standardization, contributing to elevated power generation costs and minimal

private-sector participation. Although the government has committed to establishing a formal competitive procurement policy by 2025, Chad still lacks streamlined procedures for licensing, tariff approval, and investment risk mitigation—factors that continue to undermine investor confidence.

The National Energy Compact outlines important policy directions, including expedited licensing procedures, investment facilitation tools, and the operationalization of Law 036/19, which provides a legal framework for private-sector participation in mini-grids and decentralized energy systems. However, these reforms remain at the planning stage and require significant institutional strengthening—particularly within the Agency for the Regulation of the Energy Sector (Autorité de Régulation du Secteur de l'Énergie – ARSE)—to ensure effective implementation and investor safeguards.

To accelerate progress, Chad must prioritize the full operationalization of its existing regulatory framework, build ARSE's institutional capacity, and implement a transparent IPP strategy anchored in clear licensing procedures, tariff-setting mechanisms, and competitive tendering processes. These measures are consistent with best practices identified in energy sector reform literature, which highlights the central role of regulatory certainty and transparent procurement in attracting private investment and accelerating electrification (Eberhard, 2018; Twesigye, 2022; Ayele et al., 2024).

Furthermore, the introduction of risk-sharing instruments—such as guarantees, partial risk coverage, and credit enhancement tools—will be critical in attracting long-term private capital. This approach is supported by successful experiences in other African energy markets (Ayele et al., 2024; Choi and Laxton, 2023), where blended finance and de-risking mechanisms have significantly improved private-sector participation.

Financial Readiness & Utility Reform - ■ Weak

Chad scores weak on financial readiness and utility reform, reflecting persistent underperformance of the national utility and the absence of a fully articulated cost-recovery framework.

The Société Nationale d'Électricité (SNE) remains heavily reliant on government subsidies and external donor financing, underscoring structural deficits in the utility's financial model. Although SNE publishes annual audited financial statements, it does not operate under a performance contract with the government and has yet to achieve financial equilibrium. Billing and recovery rates remain low, and electricity production—primarily reliant on costly thermal generation—exceeds regional cost benchmarks. Tariffs are not cost-reflective, contributing to persistent liquidity constraints, frequent power outages, and a limited capacity to expand and modernize service delivery.

The National Energy Compact outlines a proposed financial turnaround strategy for SNE, including a target to reduce system losses to below 15% by 2027, improvements in billing systems, and commercial restructuring. However, the compact does not include a phased tariff adjustment roadmap, nor does it provide mechanisms to reconcile affordability with long-term cost recovery. It also lacks provisions for smart metering upgrades, utility digitalization, or the introduction of financial instruments aimed at accelerating revenue collection.

To improve financial viability, Chad must adopt phased tariff reforms that reflect operational costs, coupled with targeted subsidy schemes to protect low-income and vulnerable consumers. These reforms are critical to reducing dependence on public transfers and improving the utility's creditworthiness. Building on the commitments in the compact, Chad should institutionalize performance-based audits and transparent financial reporting practices to enhance investor confidence and embed financial discipline.

Additionally, establishing a results-based smart metering fund would support revenue assurance and advance digitalization—both of which are essential for modern utility operations and long-term financial sustainability. This approach aligns with regional experiences, where utility resilience has been strengthened through the integration of commercial discipline with inclusive,

pro-poor access strategies (Trimble et al., 2016; Onyeji-Nwogu et al., 2017; Muchunku and Heinemann, 2022; Andilile and Kapaya, 2021).

Infrastructure & Regional Integration - ■ Moderate

Chad scores moderate on infrastructure and regional integration, reflecting ongoing investments in cross-border connectivity and urban grid expansion, tempered by persistent financing constraints and structural limitations.

The country's electricity infrastructure remains among the least developed in Africa, with technical and commercial losses exceeding 40% and a fragmented grid that limits energy distribution efficiency. While no active regional power exchange is currently operational, Chad is advancing the construction of the 225 kilovolt (kV) Chad–Cameroon interconnection, expected to be commissioned by 2027. This project represents a strategic entry point into the Central African Power Pool (PEAC). However, unresolved Power Purchase Agreements (PPAs) under the Central African Power Pool (CAPP) continue to delay Chad's effective integration into regional electricity markets.

The National Energy Compact outlines key interventions, including grid modernization, urban electrification, and a loss-reduction strategy. Nevertheless, the implementation of these interventions is highly dependent on external financing, with no comprehensive national financing structure in place to scale transmission infrastructure sustainably. This mirrors broader trends in low-income African energy markets, where reliance on donor grants has slowed infrastructure delivery and limited national ownership of long-term expansion plans.

To address these structural barriers, Chad must accelerate domestic transmission investments—particularly in areas earmarked for urban development—and establish a structured financing framework that leverages public-private partnerships (PPPs), concessional finance, and climate-aligned infrastructure funds. Such an approach is essential to support sustainable grid development aligned with national electrification objectives.

Additionally, finalizing regional energy trade agreements under the CAPP framework is critical to realizing the full benefits of interconnection investments. This would allow Chad to import lower-cost electricity, improve grid reliability, and enhance national energy security. These reforms are consistent with regional best practices, where countries have strengthened grid stability and regional integration through coordinated trade frameworks and targeted infrastructure financing (Tabenyang et al., 2024; Elabbas, 2024).

Clean Cooking Strategies - ■ Weak

Chad scores weak on clean cooking strategies, due to limited infrastructure, the absence of a structured national rollout plan, and ongoing implementation gaps—despite commitments to financial support mechanisms.

Over 90% of the population relies on traditional biomass—primarily firewood and charcoal—for cooking, resulting in widespread deforestation, household air pollution, and elevated risks of respiratory illness. The National Energy Compact identifies clean cooking as a strategic priority and reaffirms the government's commitment to maintaining liquefied petroleum gas (LPG) subsidies under the 2018 price structure. The compact also references existing tax exemptions for clean cooking equipment, as stipulated under the 2020 law, and encourages private-sector participation in scaling renewable and efficient cooking technologies.

Despite these policy signals, the compact lacks a detailed implementation framework for expanding LPG infrastructure, launching behavior change campaigns, or developing targeted distribution systems for rural households. In the absence of a coordinated national rollout strategy, adoption is likely to remain low—mirroring trends in other low-income contexts where market fragmentation and limited policy enforcement have constrained progress in clean cooking access.

To strengthen outcomes, Chad must operationalize its subsidy framework within a comprehensive and equity-focused implementation plan. This should include mechanisms for the equitable distribution of subsidized fuels and appliances, particularly in rural and underserved areas. In addition, public-private partnerships (PPPs) should be leveraged to invest in clean cooking infrastructure and establish last-mile distribution channels.

International experience from countries such as Senegal and Ghana demonstrate that when tax incentives and fuel subsidies are embedded within clearly defined delivery systems, they can significantly boost clean cooking adoption while preserving affordability (Das et al., 2022; Greve and Lay, 2023). Replicating these models in Chad will be essential to advancing the clean cooking agenda while delivering co-benefits in public health, environmental protection, and gender equity.

4.2 Côte d'Ivoire

Institutional Readiness - Strong

Côte d'Ivoire scores strong on institutional readiness, underpinned by a robust governance framework, clearly delineated institutional mandates, and a well-articulated energy policy ecosystem.

The country's energy sector is led by the Ministry of Mines, Petroleum, and Energy (MMPE), with regulatory oversight provided by the Autorité Nationale de Régulation du Secteur de l'Électricité (ANARE-CI)—an independent regulatory authority. Sector operations and infrastructure development are managed by Côte d'Ivoire Energies (CI-ENERGIES), a state-owned entity responsible for electricity generation, transmission, and distribution assets on behalf of the government. This tripartite institutional model ensures a clear separation of roles between policymaking, regulation, and operations, facilitating coherent policy implementation and sector planning.

The National Energy Compact highlights Côte d'Ivoire's progress in institutionalizing energy sector governance, particularly through the Electricity Code of 2014, which liberalized the market and enabled private-sector participation. Strategic direction is provided by the 2030 Energy Master Plan, supported by detailed sub-plans covering generation, transmission, and distribution infrastructure expansion.

Strong inter-agency coordination is reinforced by standardized procurement procedures, formal investor frameworks, and transparent concession contracts. These elements collectively support operational efficiency and enhance the credibility of the institutional environment. However, as electricity demand continues to grow and private-sector participation deepens, maintaining institutional cohesion will become increasingly critical.

Ensuring continued alignment between regulatory oversight, utility performance, and investor expectations will be essential to sustaining sector resilience and enabling future reforms. Côte d'Ivoire's experience reflects regional best practices, where strong institutional coordination and clear policy frameworks have proven foundational to energy sector transformation (Eweje et al., 2021; Owoola et al., 2024).

Regulatory Efficiency & Private Sector Engagement - Strong

Côte d'Ivoire scores strong on regulatory efficiency and private-sector engagement, supported by a liberalized electricity market, a mature Independent Power Producer (IPP) framework, and a robust legal and regulatory foundation.

The Electricity Code (Law No. 2014-132) officially ended the State's monopoly over electricity generation, transmission, and distribution, enabling private-sector participation across the energy value chain. By the end of 2023, five IPPs were operational under Build-Own-Operate (BOO) and Build-Own-Operate-Transfer (BOOT) contracts, contributing approximately 65% of the

country's installed generation capacity—establishing Côte d'Ivoire as a regional benchmark in IPP engagement.

Private investment is governed by a well-defined procurement framework, including Decree No. 2016-782, which mandates competitive bidding for new concessions. Although electricity tariffs are determined and revised by interministerial decree under Decree No. 2016-786, the Compact affirms that model concession agreements—including tariff structures—must be reviewed and approved by an independent regulatory body. While not explicitly named in the Compact, the Autorité Nationale de Régulation du Secteur de l'Électricité (ANARE-CI) is the designated electricity regulator and is presumed to oversee the approval of model Power Purchase Agreements (PPAs) and ensure compliance with pricing and service standards.

Investor protections are reinforced through standardized PPAs, transparent licensing procedures, and regulatory clarity—elements that continue to attract both domestic and international capital into the energy sector.

Nevertheless, the government's continued role in tariff determination may limit the transition to fully cost-reflective pricing, potentially dampening long-term investor confidence. To address this, Côte d'Ivoire should consider adopting a phased tariff liberalization strategy, paired with transparent and targeted subsidy mechanisms to safeguard affordability for vulnerable households. This dual-track approach would enhance market efficiency while preserving equity, consistent with best practices from other liberalized African electricity markets (Rubanda et al., 2023; Ackah et al., 2024).

Financial Readiness & Utility Reform - Moderate

Côte d'Ivoire scores moderate on financial readiness and utility reform, reflecting tangible progress in financial governance alongside persistent fiscal vulnerabilities.

CI-ENERGIES has benefited from relatively stable financial performance, supported by cost-reflective tariff adjustments, certified annual financial audits, and steady revenue growth. In 2023, the utility's operating balance shifted from a deficit of –US\$87.1 million in 2022 to a surplus of US\$49.6 million, signaling progress toward financial stability. However, the National Energy Compact acknowledges that this improvement remains fragile. Fuel supply disruptions, infrastructure delays, and exposure to cost shocks continue to prompt reliance on state-backed subsidies and emergency fiscal interventions.

A comprehensive financial reform plan is expected by mid-2025 to guide the gradual convergence of electricity tariffs with real cost levels. This trajectory aligns with international experiences in countries such as Ghana and Kenya, where phased subsidy reforms—coupled with performance-based contracts—significantly improved utility financial sustainability and reduced dependence on public transfers (Abekah-Nkrumah et al., 2020; Diawuo, 2020; Isser et al., 2024).

To consolidate recent gains, Côte d'Ivoire should prioritize the implementation of predictable and equitable tariff adjustments, ensuring that affordability for low-income households is preserved through targeted subsidy frameworks. Concurrently, strengthening performance-based financial oversight and introducing innovative revenue-enhancing instruments—such as green bonds, credit guarantees, and public-private investment platforms—will be essential to reinforce the long-term viability of CI-ENERGIES (Owusu-Manu, 2021; Mbori, 2023; Omar et al., 2024).

These actions align with the Compact's commitment to develop innovative financing mechanisms aimed at reducing fiscal pressure, improving utility creditworthiness, and enhancing the bankability of sector investments.

Infrastructure & Regional Integration – Strong

Côte d'Ivoire scored strong on Infrastructure & Regional Integration due to its advanced grid backbone, regional export capacity, and long-standing participation in the West African Power Pool (WAPP) (Koffi et al, 2022; Ly et al, 2024).

The country maintains one of the most extensive and modern electricity networks in West Africa, with transmission infrastructure reaching 7,553 km in 2023, up from 4,422 km in 2011, and distribution infrastructure expanding from 36,101 km to 61,286 km in the same period. Electrification efforts include rural connectivity, with over 1.7 million connections under the PEPT program (2014–2023), excluding solar kits.

Côte d'Ivoire acts as a regional energy hub, exporting 1,052 GWh of electricity in 2023, primarily to Ghana, Mali, Burkina Faso, Liberia, Sierra Leone, and Guinea under bilateral agreements. However, the Compact notes rising domestic demand, project implementation delays, and payment arrears from importing countries, which may constrain future export capacity.

Comparative experiences from Kenya and Ethiopia illustrate how rapidly rising domestic demand can constrain regional electricity trade when not matched with proactive grid investments and modernized transmission infrastructure (Akinyemi et al., 2019; Adebayo et al., 2024). Côte d'Ivoire's internal growth trajectory and occasional delays in transmission projects mirror these risks. Without continuous expansion of domestic grid capacity and well-structured cross-border power purchase agreements (PPAs), the country's ability to sustain its leadership role in WAPP electricity exports could be affected.

To sustain its regional leadership, Côte d'Ivoire must maintain steady infrastructure investments and improve the reliability of regional exports by resolving contract enforcement and payment risks. Strengthening digital monitoring, expanding bilateral PPAs, and securing WAPP-related financing will be critical to balancing domestic energy security with regional trade ambitions (Onabowale, 2024).

Clean Cooking Strategies - Moderate

Côte d'Ivoire scores moderate on clean cooking strategies, reflecting a structured policy approach and continued government commitment, though significant affordability and access gaps persist—particularly in rural areas.

Clean cooking has been integrated into the country's broader energy strategy, with notable progress in liquefied petroleum gas (LPG) promotion. The government currently applies a 50% subsidy on butane gas refills for households and has introduced tax exemptions for clean cooking equipment under the 2024 fiscal annex. Additionally, international development partners such as ENABEL and ENI have supported the rollout of over 300,000 improved cookstoves and the implementation of a four-year public-private clean cooking promotion program.

Despite these initiatives, high upfront costs for LPG cylinders and improved stoves remain a key barrier to adoption, particularly among rural and low-income households (Vassiliades et al., 2022). While the Compact acknowledges that these technologies offer long-term economic and health benefits, affordability perceptions and limited rural distribution infrastructure continue to constrain scale-up efforts outside urban centers.

Comparative experiences from Rwanda and India underscore the importance of subsidizing initial equipment costs, combined with behavior change campaigns and private-sector delivery models, to accelerate adoption among low-income populations (Čukić et al., 2021). Côte d'Ivoire's clean cooking framework aligns with these principles but requires further investment and targeted implementation to close persistent access gaps.

To accelerate progress, Côte d'Ivoire should extend its subsidy scheme to explicitly cover upfront equipment costs, including LPG cylinders and stoves, with a particular focus on rural households. Scaling up private-sector

partnerships will be essential to strengthen rural distribution networks and improve supply chain resilience. These efforts will ensure that clean cooking solutions are not only available but also affordable and accessible across all population segments (Prasad et al., 2025).

4.3 Democratic Republic of the Congo (DRC)

Institutional Readiness – Moderate

The Democratic Republic of the Congo scored moderate on Institutional Readiness due to the presence of essential regulatory institutions and reform frameworks, although implementation bottlenecks and coordination weaknesses persist.

The energy sector is governed by the Ministry of Water Resources and Electricity (MRHE), while the Société Nationale d'Électricité (SNEL) remains the vertically integrated public utility responsible for over 90% of national electricity supply. However, SNEL faces serious structural constraints, including high debt levels exceeding USD 3 billion, a 46% loss rate, and chronic underperformance linked to its financial and operational dependence on government subsidies.

The Electricity Sector Regulatory Authority (ARE) was established to strengthen sector oversight, but institutional overlaps between central, provincial, and local governments have created friction in policy execution. The Compact explicitly calls for clarifying and strengthening the mandates of all governance levels to improve planning and management of electrification projects. These overlapping roles, combined with limited institutional capacity, contribute to frequent project delays and poor coordination across agencies.

Comparative studies from countries like Sudan and Mozambique highlight that state-owned utilities with restricted autonomy and fragmented governance structures often struggle to deliver on national electrification targets, particularly in remote or rural regions (Mostert et al., 2021). Similar dynamics are evident in DRC, where despite the presence of a national electrification policy, policy execution suffers from weak accountability and excessive reliance on donor-driven projects (Foster and Rana, 2019).

To improve institutional effectiveness, SNEL must undergo financial and operational restructuring, reduce dependence on government transfers, and strengthen revenue collection mechanisms. Enhancing coordination between MRHE, ARE, and SNEL will be vital for reducing bureaucratic delays and aligning infrastructure delivery with national planning objectives. Additionally, establishing a clearer regulatory framework, supported by enforceable mandates and capacity-building programs, will promote transparency, accelerate implementation, and build investor confidence in the sector (Nwaila et al., 2024).

Regulatory Efficiency & Private Sector Engagement - Weak

The Democratic Republic of the Congo (DRC) scores weak on regulatory efficiency and private-sector engagement, owing to persistent legal ambiguities, weak regulatory enforcement, and an underdeveloped enabling environment for investment.

The electricity sector is regulated by the Autorité de Régulation du Secteur de l'Électricité (ARE) and governed under Law No. 14/011 of 2014, which provides the legal foundation for private-sector participation. However, the National Energy Compact acknowledges that this legal framework requires strengthening, revision, and adaptation to address emerging sectoral challenges—particularly regarding licensing procedures, third-party grid access, and cost-reflective tariff design.

Key constraints to private-sector engagement include non-standardized licensing processes, slow and opaque permitting procedures, and the absence of streamlined mechanisms for Independent Power Producer (IPP) approval. To address these gaps, the Compact proposes the establishment of a “single

window” to centralize permitting processes for large-scale private projects, alongside the simplification of licensing requirements and the development of standardized agreements with multi-year tariff frameworks to increase investment predictability.

In terms of pricing, the Compact confirms the government’s commitment to introduce a new cost-recovery-oriented tariff regime by January 2026, enabling the national utility Société Nationale d’Électricité (SNEL) to fully cover its operational costs. This reform implicitly acknowledges that current tariff structures do not guarantee cost recovery and remain heavily influenced by state-led planning processes, rather than transparent or market-based mechanisms. The absence of predictable, independent tariff-setting continues to be a major deterrent to private-sector investment.

Comparative evidence from Angola and Cameroon shows that where regulatory frameworks are ambiguous, licensing procedures are inconsistent, and tariffs are not cost-reflective, investor confidence deteriorates, often resulting in stalled project development and chronic underinvestment (Michoud and Hafner, 2021; Williams et al., 2015).

To improve regulatory efficiency, the DRC should accelerate revisions to the 2014 Electricity Law to clarify institutional roles—particularly between ARE and the Ministère des Ressources Hydrauliques et Électricité (MRHE)—and to define enforceable procedures for IPP participation. The operationalization of the single-window permitting mechanism, alongside the adoption of standardized licensing guidelines and tariff structures, would significantly improve project development timelines and transparency. While the Compact’s proposed tariff reforms represent a step toward financial viability, their successful implementation will require a transparent, predictable, and phased process, balancing cost recovery with affordability to bolster investor confidence and support inclusive energy access (Babatunde et al., 2024; Tenenbaum and Greacen, 2025).

Financial Readiness & Utility Reform - ■ Weak

The Democratic Republic of the Congo (DRC) scores weak on financial readiness and utility reform, reflecting persistent challenges in cost recovery, utility performance, and investor confidence—despite recent reform commitments.

The National Energy Compact outlines a comprehensive financial recovery strategy for SNEL centered on debt restructuring, revenue enhancement, and operational modernization. Key components include the deployment of an Enterprise Resource Planning (ERP) system, the generalization of digital invoice payment, and the initiation of annual financial audits, beginning in 2023. A primary objective is to ensure 100% operational cost coverage through the adoption of a new tariff regime by January 2026, with full cost recovery targeted by 2029.

The government also aims to mobilize US\$37 billion in energy investments, including US\$17 billion in public funding and US\$20 billion from private sources. This includes the planned expansion of the Results-Based Financing (RBF) Mwindi Fund to US\$1 billion and the establishment of a US\$200 million credit line to support decentralized energy access. Additionally, the Compact sets an ambitious target to reduce technical and commercial losses from 46% to 15% by 2030.

However, SNEL continues to face major structural and financial constraints. Tariffs remain non-cost-reflective, and the utility holds a debt stock exceeding US\$3 billion. Moreover, financial transparency has been limited, with the last publicly available audited report dating back to 2020. While the rollout of ERP systems and digital billing may improve cost control and administrative efficiency, their impact will depend on enforcement capacity, consumer compliance, and the accuracy of metering systems. Notably, the Compact does not explicitly reference smart metering, though digital tools are expected to support improvements in revenue collection.

The Compact also proposes the creation of a second public electricity company by 2026–2027, tasked with managing new infrastructure and strategic transmission corridors. While this could enhance institutional specialization and operational focus, it also raises concerns about governance fragmentation and institutional overlap. The potential for private-sector participation in the new entity remains under consideration.

To improve financial sustainability, DRC should implement phased, cost-reflective tariff adjustments, balanced with affordability protections for vulnerable populations. Strengthening bill enforcement mechanisms, expanding prepaid metering, and integrating digital billing systems with field-level operations will be essential to reducing commercial losses (Ahmad, 2017; Carr and Thomson, 2022). Additionally, institutionalizing independently conducted and publicly disclosed audits will enhance transparency, bolster SNEL’s creditworthiness, and help rebuild investor confidence in the sector.

Infrastructure & Regional Integration - ■ Moderate

The Democratic Republic of the Congo (DRC) scores moderate on infrastructure and regional integration, reflecting an ambitious yet high-risk infrastructure expansion strategy anchored in regional power trade and long-term sectoral reforms.

The government aims to increase installed generation capacity from 3,067 MW to 13,576 MW and scale annual electricity production from 15,261 GWh to 65,000 GWh by 2030. These targets are underpinned by major infrastructure projects, including the Grand Inga hydropower complex and new transmission corridors connecting to Zambia, Angola, and East Africa, positioning the DRC as a regional energy hub. The country is actively pursuing integration with both the Southern African Power Pool (SAPP) and the Central African Power Pool (CAPP). Priority grid investments include the DRC–Zambia 220 kV interconnection and the Inga–Kolwezi–Bunia transmission corridor.

The National Energy Compact also highlights a strong focus on grid modernization and a targeted reduction in technical and commercial losses, from 46% to 15% by 2030. However, persistent constraints—such as limited implementation capacity, financing gaps, and delays in securing bankable Power Purchase Agreements (PPAs)—continue to impede progress. The Grand Inga project, in particular, has been subject to prolonged delays due to political uncertainty and difficulty achieving financial closure, raising concerns about its long-term feasibility (Gnassou, 2019).

To manage these risks, the Compact emphasizes the importance of a phased infrastructure rollout, improved planning and inter-agency coordination, and expanded efforts to diversify the energy mix—especially through solar photovoltaics (PV) and decentralized hybrid mini-grids in off-grid areas. Comparative experiences from Ethiopia and Kenya suggest that regional power integration efforts are most successful when accompanied by sustained grid investments, enforceable PPAs, and diversification strategies that reduce vulnerability to hydrological and political shocks (Adebayo et al., 2024; Akinyemi et al., 2019).

To strengthen regional integration and system reliability, the DRC should prioritize the timely completion of key transmission infrastructure, finalize binding cross-border PPAs, and operationalize grid modernization programs (Tabenyang et al., 2024). Scaling renewable generation and reducing system losses will further enhance domestic energy resilience while enabling the DRC to capitalize on regional trade opportunities.

Clean Cooking Strategies - ■ Weak

Over 95% of households in the Democratic Republic of the Congo (DRC) continue to rely on traditional biomass fuels, presenting substantial environmental, health, and gender-related challenges. In response, the government has committed to increasing clean cooking access to 30% by 2030, a significant scale-up from the current estimated cooking access rate of just 1%. A

National Clean Cooking Strategy is expected to be adopted by the end of 2025 to guide these efforts.

The National Energy Compact outlines a range of proposed reforms, including the elimination of import duties on clean cooking technologies, provision of financial support to private operators, development of local cookstove manufacturing parks, and promotion of public-private partnerships (PPPs). Additional measures include investment in supply chain infrastructure, public awareness campaigns, and expansion of LPG storage and safety stocks.

Despite these policy commitments, DRC's clean cooking ecosystem remains severely underdeveloped. LPG penetration stands at just 14% in Kinshasa, and adoption rates are even lower in rural areas. High upfront costs for LPG cylinders and cookstoves, underdeveloped distribution networks, and limited rural access continue to act as structural barriers to widespread adoption. Furthermore, the forthcoming clean cooking strategy currently lacks a detailed implementation roadmap, with no clearly defined financing mechanisms, performance indicators, or institutional capacity to support delivery.

To address these gaps, the DRC must accelerate policy execution, with a focus on finalizing the 2025 strategy, securing long-term financing for subsidies, and investing in LPG infrastructure across the storage, transport, and retail value chain. The planned expansion of local cookstove manufacturing presents strong potential to reduce costs and generate employment, but this opportunity will require targeted fiscal incentives, technical assistance, and coordinated supply chain development.

These priorities are consistent with international best practices. Case studies from Nepal and Indonesia demonstrate that clean cooking transitions have been most successful when supported by sustained LPG subsidies, regulatory clarity, and rural distribution strategies, which collectively drive adoption and affordability (Das et al., 2020; Pye et al., 2020; Khavari et al., 2023; Dalaba, 2018; Adams et al., 2023).

4.4 Liberia

Institutional Readiness – Moderate

Liberia aims to expand electricity access from 32.7% to 75% by 2030, through a combination of grid extension, off-grid, and mini-grid solutions, with a particular focus on underserved rural areas. This vision is anchored in the National Electrification Strategy (NES), which is slated for revision and will be supported by a new five-year electrification plan by 2026.

Institutional reform is a core pillar of this agenda. The Liberia Electricity Regulatory Commission (LERC), established under the 2015 Electricity Law, has become operational and is progressively introducing key regulations, including licensing frameworks, tariff guidelines, dispute resolution mechanisms, and technical codes for mini-grids.

To enhance project tracking and improve transparency, the government plans to develop a National Electrification Monitoring System (NEMS)—a centralized platform for tracking electricity access progress and evaluating implementation outcomes. Meanwhile, the Rural and Renewable Energy Agency (RREA), established in 2010, continues to play a pivotal role in coordinating rural electrification efforts, including the alignment of off-grid strategies with private-sector actors, development partners, and national planning priorities.

However, as acknowledged in the National Energy Compact, Liberia's institutional effectiveness remains constrained by overlapping mandates, coordination challenges, and limited implementation capacity, particularly in areas such as regulatory enforcement and rural project execution. RREA, in particular, faces significant technical and financial capacity limitations, which threaten to delay energy access expansion in under-electrified counties.

Comparative studies from Sub-Saharan Africa underscore the importance of independent, well-resourced regulatory institutions in accelerating electrification and attracting private-sector investment (Namujju et al., 2023). In line with these findings, Liberia must prioritize the capacity strengthening of RREA, particularly in terms of technical staffing, project management, and sustainable financing mechanisms.

Additionally, fast-tracking the full operationalization of LERC's regulatory functions, including oversight of mini-grid deployment and tariff enforcement, will be essential to consolidating reforms. Integrating the National Electrification Monitoring System into national planning and donor coordination frameworks will further enhance investment transparency, streamline project tracking, and improve policy execution.

Regulatory Efficiency & Private Sector Engagement – Moderate

Liberia scores moderate on regulatory efficiency and private-sector engagement, reflecting the presence of foundational legal and institutional reforms designed to attract private capital, though key implementation gaps persist.

The National Energy Compact outlines Liberia's commitment to transitioning from direct negotiations to competitive procurement mechanisms for electricity generation and distribution concessions. A proposed competitive procurement policy aims to introduce structured and transparent bidding processes to enhance efficiency and reduce transaction risk. In parallel, the government is working to strengthen the legal and regulatory framework for off-grid electrification, including the finalization of licensing and tariff regimes for mini-grids, and the standardization of quality-of-service requirements for standalone systems.

To support private-sector engagement, Liberia plans to revise its existing Public-Private Partnership (PPP) Law, establish a centralized PPP coordination unit, and finalize model PPP agreements for energy-sector investments. These reforms are intended to improve inter-agency coordination and streamline the modalities for private investment. The Compact also proposes the creation of a Renewable Energy Investment Platform, designed to serve as both a financing mechanism and coordination tool to support small- and medium-scale renewable energy projects, particularly in solar, hydropower, and biomass technologies.

Despite these promising frameworks, the Compact acknowledges that Liberia has yet to fully operationalize many of its regulatory commitments. Key outstanding actions include the publication and enforcement of licensing guidelines, clarification of tariff approval procedures, and the establishment of institutional coordination mechanisms to support coherent implementation.

Comparative evidence from West Africa highlights that in the absence of clearly defined regulatory procedures, performance-based contracting, and enforceable risk-sharing frameworks, private-sector participation often stalls, resulting in underdeveloped project pipelines and limited investment mobilization (Wright et al., 2024; Okorieimoh and Ehimen, 2024).

To enhance regulatory efficiency and unlock private capital, Liberia should prioritize the finalization and publication of its mini-grid licensing and tariff frameworks, operationalize the PPP coordination unit, and institutionalize the Renewable Energy Investment Platform. Ensuring legal clarity, bankable model agreements, and strong implementation coordination will be essential to building investor confidence and delivering inclusive, decentralized electrification.

Financial Readiness & Utility Reform – Moderate

Liberia scores moderate on financial readiness and utility reform, reflecting credible reform strategies and investment targets, tempered by persistent structural risks and institutional vulnerabilities.

The government aims to mobilize US\$1.29 billion in financing between 2024 and 2030, with US\$1.15 billion from public sources and US\$140 million from private capital, to support energy infrastructure, distributed renewable energy, and clean cooking solutions. Through the Rural and Renewable Energy Agency (RREA), Liberia plans to expand Results-Based Financing (RBF) facilities to enhance affordability for off-grid energy users and incentivize private-sector participation in last-mile electrification.

On the utility side, Liberia has committed to restoring the financial viability of the Liberia Electricity Corporation (LEC) by FY2028, through a comprehensive package of measures: reducing commercial losses, scaling up prepaid metering systems—particularly among public-sector consumers—diversifying the customer base, and adopting a multi-year cost-reflective tariff regime. The government also plans to begin publishing LEC’s audited financial statements annually starting in 2025, in alignment with international transparency and accountability standards (Nuhu & Alam, 2024).

As of mid-2024, LEC had reduced commercial losses from 47.7% in 2021 to 27.4%, with a further reduction target of below 20% by 2030. However, the Compact notes that private capital mobilization remains limited, due largely to LEC’s weak credit profile and Liberia’s broader macroeconomic challenges. To address this, international experience underscores the importance of deploying de-risking instruments—such as partial risk guarantees, insurance facilities, and concessional finance—to stimulate private-sector investment in fragile energy markets (Sacchetto and Logan, 2021; Sesele, 2022).

Going forward, Liberia’s ability to attract sustained investment will depend on the transparent enforcement of its utility reform agenda—particularly the effective implementation of metering systems, the phased transition of subsidies, and public access to independently verified audit results. These steps will be essential to enhance investor confidence, improve financial discipline, and align Liberia’s utility governance with global best practices for sustainable energy sector reform.

Infrastructure & Regional Energy Integration Readiness – Moderate

Liberia scores moderate on infrastructure and regional energy integration readiness, reflecting ambitious generation and transmission targets tempered by persistent infrastructure constraints and implementation risks.

The government plans to modernize its transmission and distribution networks, including the expansion of high-voltage lines, substations, and grid reinforcement projects to improve system reliability and support broader access. By 2030, Liberia aims to increase installed generation capacity to 266 MW, with 238 MW derived from renewable energy, including utility-scale solar and hydropower. Key generation projects include the proposed 150 MW Saint Paul 2 Hydropower Plant (HPP) and a 60 MW extension at the Mount Coffee HPP.

At the regional level, Liberia is prioritizing the 225 kV Côte d'Ivoire–Liberia–Sierra Leone–Guinea (CLSG) interconnection as a vital source of low-cost electricity imports. The Compact reaffirms Liberia’s commitment to meeting payment obligations under existing power purchase agreements (PPAs) and actively engaging with the West African Power Pool (WAPP) to adopt harmonized transmission pricing and regulatory frameworks.

Despite these efforts, Liberia’s domestic grid infrastructure remains weak, particularly outside of Monrovia, where limited network coverage constrains rural electrification. Delays in financing, procurement, and project execution continue to pose risks to the timely delivery of new infrastructure. The Compact recognizes the urgent need for a comprehensive power system master plan to align future generation capacity with corresponding transmission and

distribution investments. Such alignment is critical to avoiding stranded generation assets, minimizing system losses, and ensuring the efficient utilization of new capacity.

Empirical research confirms that across Sub-Saharan Africa, weak transmission infrastructure has frequently undermined generation growth, leading to unreliable supply and underutilized assets (Gregory and Sovacool, 2019; Oguah and Chattopadhyay, 2019).

To advance regional integration and system reliability, Liberia must ensure that grid expansion and generation planning are fully synchronized. Additionally, securing long-term, enforceable PPAs—including under WAPP mechanisms—will be essential to stabilize energy imports and support cross-border electricity trade.

Clean Cooking Strategies – Weak

Liberia scores weak on clean cooking strategies, reflecting acknowledged policy intent but delayed implementation, absence of measurable targets, and lack of dedicated financing mechanisms.

While the National Energy Compact recognizes the urgency of expanding clean cooking access, it does not establish a baseline, set a 2030 national access target, or define interim performance benchmarks. The government has committed to developing a National Clean Cooking Strategy by December 2025, followed by a detailed policy framework and action plan in 2026, with a stated emphasis on expanding access for female-headed households. However, the deferral of critical decisions—such as target-setting and investment planning—to a future strategy has created a policy vacuum during the current period.

In contrast to peer countries that have established quantified national targets, backed by actionable roadmaps and institutional mandates, Liberia’s delayed and open-ended approach limits its ability to attract private-sector investment, coordinate donor financing, or catalyze market adoption. Comparative research from Sub-Saharan Africa demonstrates that clearly articulated national goals, paired with regulatory frameworks and financial incentives, are key drivers of scalable clean cooking interventions (Lambe et al., 2015; Stritzke et al., 2021; Acheampong et al., 2023).

To close these gaps, Liberia should prioritize the finalization of its Clean Cooking Strategy, ensuring that it is accompanied by a robust execution framework comprising time-bound national targets, dedicated financing mechanisms, and clearly defined institutional responsibilities. The strategy should include pathways for private-sector engagement, local manufacturing, and distribution partnerships, supported by affordability-enhancing mechanisms such as microfinance, results-based subsidies, or tax incentives.

In parallel, the government should launch targeted public awareness campaigns to promote the health, environmental, and economic co-benefits of clean cooking, helping to build consumer demand and behavioral change—particularly in rural and low-income communities.

4.5 Madagascar

Institutional Readiness - Moderate

Madagascar scores moderate on institutional readiness, reflecting a well-articulated reform agenda constrained by structural inefficiencies and limited implementation clarity.

The Energy Compact outlines a national objective to increase electricity access to 80% by 2030, supported by plans to establish a National Energy Governance Framework and operationalize an Independent Electricity Sector Regulatory Authority (ARELEC). These institutional reforms represent a strategic shift toward improving regulatory transparency, sectoral coordination, and oversight of market operations.

However, the dominant role of JIRAMA—the vertically integrated national utility—continues to present significant operational and structural risks to reform implementation. Persistent inefficiencies within JIRAMA undermine service delivery, financial stability, and market competitiveness. While the creation of ARELEC offers the potential to enhance market oversight and regulatory independence, its effectiveness will depend on the legal clarity of its mandate, financial autonomy, and insulation from political interference.

Comparative evidence underscores these concerns. In Kenya, regulatory success has been attributed to the institutional autonomy and legal empowerment of the national regulator (Newell et al., 2014). Conversely, Nigeria’s reform trajectory has been impeded by inadequate enforcement capacity and the regulator’s limited ability to act independently of political influence (Oyewunmi & Ehanmo, 2021).

Although the Compact calls for improved inter-agency coordination, it offers limited detail on how monitoring systems, performance-based incentives, or accountability mechanisms will be institutionalized during implementation. Experiences from Tanzania illustrate the benefits of integrating real-time electrification data into national planning processes (Mereu, 2022; Philipo et al., 2020), while evidence from Malawi suggests that aligning institutional incentives can significantly enhance policy execution and delivery outcomes (McCauley et al., 2022; Chisale & Lee, 2023; Nkhoma et al., 2024).

To strengthen institutional effectiveness, Madagascar should ensure that ARELEC is granted legal and financial independence, adopt performance-based contracts for JIRAMA to improve accountability, and invest in structured institutional coordination platforms to support oversight, implementation, and cross-sectoral alignment.

Regulatory Efficiency & Private Sector Engagement – Moderate

Madagascar scores moderate on regulatory efficiency and private-sector engagement, reflecting promising policy commitments constrained by gaps in implementation, legal clarity, and institutional coordination.

The Energy Compact affirms the government’s intention to reinforce the regulatory environment by strengthening ARELEC, Madagascar’s electricity regulator, established under the 2017 Electricity Act. ARELEC is legally autonomous and endowed with financial independence; however, its operationalization remains pending, requiring a formal implementing decree to become fully functional. The Compact also proposes the adoption of a suite of supporting regulatory instruments to enable effective sector oversight.

To enhance private-sector participation, the government plans to extend technical and financial support to Independent Power Producers (IPPs) and decentralized energy actors—including solar home systems (SHS), mini-grids, and productive use of energy (PUE) initiatives. These efforts are intended to complement broader sectoral reforms aimed at restoring the financial health of JIRAMA, including debt reduction and the publication of audited financial statements to improve transparency and rebuild investor confidence.

Despite these reforms, Madagascar has yet to establish clear procurement procedures, legal guarantees, or defined approval timelines for IPPs, which continues to hinder private investment. Comparative evidence illustrates how regulatory design and implementation shape investor confidence: Senegal, for instance, has successfully scaled IPP participation through risk-mitigated Power Purchase Agreements (PPAs) and transparent procurement mechanisms. Conversely, Ethiopia’s IPP program has experienced delays due to overlapping institutional mandates and ambiguous approval processes (Ayele et al., 2024). In contrast, Ghana’s centralized, time-bound approval structure has minimized transaction delays and facilitated IPP deployment (Boamah & Rothfuß, 2018), while Mali has struggled with fragmented coordination, despite its engagement in regional power markets (Bissiri et al., 2024).

These cases underscore the importance of legal certainty, streamlined permitting processes, and inter-agency coordination as preconditions for attracting private-sector capital in the energy sector.

To fully unlock private investment, Madagascar should expedite the operationalization of ARELEC, adopt clear and enforceable rules for project approval and investor protection, and enhance coordination among line ministries, regulators, and implementing agencies involved in energy procurement and oversight.

Financial Readiness & Utility Reform – Moderate

Madagascar scores moderate on financial readiness and utility reform, reflecting well-structured reform plans and investment targets, tempered by persistent vulnerabilities in utility performance and execution capacity.

The Energy Compact outlines an estimated US\$7.2 billion investment requirement to achieve national electricity access and energy transition objectives. Of this total, US\$1.15 billion has been secured from development partners, leaving a US\$6.1 billion financing gap. To contribute to gap closure, the government has pledged annual public investments of approximately US\$100 million through 2030. In parallel, Results-Based Financing (RBF)—mobilized from bilateral donors and philanthropic partners—is expected to play a pivotal role in de-risking mini-grid, off-grid, and clean cooking investments, notably through initiatives such as the LEAD and DECIM platforms.

JIRAMA, Madagascar’s vertically integrated national utility, is currently implementing a Financial Recovery Plan that includes operational cost reductions, debt restructuring, and governance reforms, including the appointment of international technical experts to key leadership positions. To enhance transparency and build investor confidence, the government has committed to the annual publication of JIRAMA’s audited financial statements, with reports for 2019 through 2023 already publicly released.

The Compact sets a target to reduce technical and commercial losses to below 16% by 2030, down from nearly 30% in 2023. While the plan does not elaborate specific reforms in metering or billing systems, it prioritizes improvements in service reliability, financial accountability, and the gradual introduction of end-user tariff indexation mechanisms that balance cost recovery with affordability protections for vulnerable populations.

International experience affirms the centrality of performance-based financing and transparent implementation. In Rwanda and Tanzania, RBF schemes tied to measurable service milestones improved investor confidence and project delivery outcomes (Spalding-Fecher et al., 2015). In contrast, Mali’s experience highlights the risks of delayed disbursements and weak targeting, which eroded impact and sector credibility (Trotter et al., 2017). Likewise, Ghana has demonstrated the benefits of robust billing enforcement and utility governance reforms, while Nigeria illustrates that technical upgrades alone are insufficient without parallel improvements in revenue collection systems (Aliu, 2020).

To consolidate reform momentum, Madagascar must ensure timely, metric-based disbursements, enforce consistent billing and collections, and maintain transparency through independently verified audits. As shown in Uganda, such transparency can significantly enhance utility creditworthiness and foster long-term investor confidence (Godinho and Eberhard, 2019).

Infrastructure & Regional Energy Integration Readiness - Moderate

Madagascar scores moderate on infrastructure and regional energy integration readiness, reflecting ambitious renewable energy and transmission targets, tempered by structural limitations, aging assets, and early-stage cross-border coordination.

According to the National Energy Compact, Madagascar has an installed generation capacity of 828 MW, though only 478 MW is currently available due to the degradation of aging hydropower and thermal facilities. In response, the government aims to increase the renewable energy share to 85% of the national energy mix by 2030, with a focus on hydropower, solar, and wind. The General State Policy (PGE) prioritizes three major hydropower projects—Volobe (121

MW), Sahofika (192 MW), and Ranomafana (64 MW)—totaling 374 MW in planned capacity.

To support this expansion, Madagascar has adopted the Least Cost Development Plan (PDMC) (2022), and will finalize a national electrification and investment plan by December 2025. These plans will incorporate demand forecasting, life-cycle cost assessments, and regional resource mapping, with the objective of aligning generation development with transmission infrastructure.

Lessons from peer countries underscore the risks of poor planning integration. In Kenya, delays in transmission investment relative to renewable generation led to stranded capacity and grid congestion, impeding the delivery of clean energy (Ndiritu and Engola, 2020; Ogeya et al., 2021). To avoid similar outcomes, Madagascar must prioritize timely grid upgrades in tandem with renewable energy deployment.

The Compact also identifies strong potential for hybrid mini-grid scale-up, particularly in isolated JIRAMA-operated networks. Platforms such as the DECIM project support private-sector participation in mini-grid development, although persistent barriers—including high capital costs and low customer affordability—continue to constrain commercial viability. Rwanda’s experience demonstrates that success in this domain requires robust regulatory frameworks and public-private partnerships, which have helped scale mini-grids sustainably (Babayomi et al., 2023).

On regional integration, feasibility studies for cross-border interconnections are ongoing, but no binding power purchase agreements (PPAs) have been signed to date. As evidenced in Mozambique, early negotiation and structuring of cross-border PPAs are critical to unlocking the benefits of regional energy trade and attracting infrastructure finance (Elabbas et al., 2023; Hancock, 2024).

To realize its infrastructure goals, Madagascar must ensure that generation and transmission planning are synchronized, scale public-private investment in mini-grids through tailored de-risking tools, and prioritize the legal and technical frameworks needed to advance regional interconnection and future trade participation.

Clean Cooking Strategies - Moderate

Madagascar scores moderate on clean cooking strategies, reflecting the presence of clear national targets and policy instruments, but tempered by early-stage implementation and unresolved financing and delivery challenges.

The Energy Compact establishes an ambitious target to expand clean cooking access to 50% of the population by 2030, equivalent to approximately 3.5 million households or 18 million people. To support this objective, the government plans to adopt a multi-pronged strategy that includes expansion of LPG distribution infrastructure, support for local production of improved biomass cookstoves, the introduction of targeted subsidies and tax exemptions, and the implementation of national awareness campaigns to promote behavioral change and increase adoption.

Comparative international experience affirms the potential of such approaches. In India, the Pradhan Mantri Ujjwala Yojana (PMUY) successfully scaled LPG access among low-income households through a combination of subsidized fuel access, behavioral change communication, and expanded retail infrastructure (Jeuland et al., 2023a; Guta et al., 2024). Likewise, in Cameroon, cylinder exchange schemes and investment in LPG retail infrastructure led to notable increases in urban and peri-urban clean cooking adoption (Lambe et al., 2015). In contrast, Malawi’s limited progress highlights the risks posed by weak delivery systems, supply chain fragmentation, and affordability constraints (Van Leeuwen et al., 2017).

The Compact also emphasizes support for local cookstove manufacturing, a key enabler for affordability, supply chain resilience, and job creation. Rwanda’s experience, where production incentives were paired with national quality standards, illustrates how structured domestic manufacturing can drive

market growth and socio-economic benefits (Jagger & Das, 2018; Nyaga et al., 2021).

Public awareness will be critical to shifting consumer behavior. A national awareness campaign is planned to highlight the health benefits, time savings, and economic advantages of clean cooking. Evidence from Kenya demonstrates that when behavior change communication is embedded within national strategies, it can significantly enhance LPG adoption, especially among low-income and rural households (Thumbi, 2022; Salas Salazar, 2023).

To translate these policy commitments into measurable impact, Madagascar must prioritize mobilizing dedicated financing, strengthening supply chain logistics, and executing targeted outreach programs. Furthermore, building public-private partnerships will be essential to ensure sustainable access across both urban and rural markets, and to catalyze innovation in product design, delivery models, and consumer financing.

4.6 Malawi

Institutional Readiness - Moderate

Malawi scores moderate on institutional readiness, underpinned by clearly defined reform priorities and an ambitious electrification agenda, but tempered by persistent coordination challenges and operational constraints within key sector institutions.

The government targets an increase in electricity access from 25.9% in 2024 to 70% by 2030, emphasizing a diversified approach that includes grid densification, mini-grids, and off-grid solar systems to serve underserved and rural populations. Central to this effort is the ongoing reform of the Electricity Supply Corporation of Malawi (ESCOM). Following its 2016 unbundling, which established EGENCO as a separate entity for generation, ESCOM retained responsibility for transmission and distribution. The Energy Compact outlines further internal restructuring measures for ESCOM, including a functional review, a digital utility transformation strategy, and the decentralization of operations through regional satellite offices. These initiatives aim to enhance operational efficiency, reduce system losses, and improve customer service delivery.

Malawi’s institutional trajectory aligns with broader utility unbundling reforms across Sub-Saharan Africa. In Ghana, the separation of transmission (GRIDCo) and distribution (ECG) strengthened operational mandates, improved regulatory clarity, and enabled greater private-sector participation (Asantewaa, 2023). Conversely, Nigeria’s fragmented unbundling, marked by sequencing challenges and unclear institutional roles, led to regulatory overlaps, coordination breakdowns, and limited improvements in service delivery (Nweke-Eze et al., 2022). Internationally, experiences from India—particularly the restructuring of electricity distribution in Delhi—demonstrate that successful unbundling hinges on strong political backing, performance-based contracts, and transparent tariff regimes, which together facilitated a credible transition to private-sector operation (Ordóñez et al., 2023).

The Compact also outlines plans to strengthen the Malawi Energy Regulatory Authority (MERA) by enhancing its technical capacity and supporting its role in ensuring regulatory oversight and market transparency. Comparative evidence from Kenya demonstrates that regulatory autonomy, when paired with enforcement authority and robust oversight mechanisms, significantly improves investor confidence and underpins sectoral stability (Godinho and Eberhard, 2019b).

While Malawi’s reform roadmap is well-articulated, successful implementation will require resolving institutional fragmentation, maintaining political commitment, and enhancing regulatory authority. Clearly defining ESCOM’s operational role and ensuring that MERA is sufficiently empowered to

enforce sector rules will be essential to addressing long-standing structural inefficiencies and achieving national electrification goals.

Regulatory Efficiency & Private Sector Engagement - Moderate

Malawi scores moderate on institutional readiness, underpinned by clearly defined reform priorities and an ambitious electrification agenda, but tempered by persistent coordination challenges and operational constraints within key sector institutions.

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While Malawi's reform roadmap is well-articulated, successful implementation will require resolving institutional fragmentation, maintaining political commitment, and enhancing regulatory authority. Clearly defining ESCOM's operational role and ensuring that MERA is sufficiently empowered to enforce sector rules will be essential to addressing long-standing structural inefficiencies and achieving national electrification goals.

Financial Readiness & Utility Reform - Moderate

Malawi scores moderate on financial readiness and utility reform, reflecting a defined investment strategy alongside persistent utility performance challenges. The government estimates a \$5.5 billion financing need by 2030, with \$530.8 million secured and a \$4.95 billion gap remaining. To enhance sector viability, the compact outlines implementation of ESCOM's Financial Recovery Plan, including debt restructuring, cost containment, and a nationwide rollout of Advanced Metering Infrastructure (AMI) and prepaid systems to reduce revenue losses and improve billing efficiency. The government also commits to publishing audited financial statements within six months of the fiscal year-end to boost transparency and investor confidence.

The compact targets a reduction in Aggregate Technical, Commercial, and Collection (ATCC) losses from 20.73% to 17%, requiring consistent operational

reforms and enforcement. To strengthen outcomes, AMI deployment must be paired with robust revenue protection and enforcement mechanisms to address non-payment. Tariff reforms should be phased to protect vulnerable consumers while ensuring financial sustainability. The government's pledge to timely, independent, and publicly available audits is a critical step toward restoring credibility and enhancing regulatory oversight.

Infrastructure & Regional Energy Integration Readiness - Moderate

Malawi scores moderate on infrastructure and regional integration readiness, reflecting well-articulated expansion plans tempered by execution and coordination risks. The compact outlines a planned generation capacity increase of 848 MW by 2030, comprising 445 MW from hydropower, 186 MW from solar, 167 MW from wind, and 50 MW from biomass. To support this growth, investments in grid reinforcement are prioritized, including the 132 kV Eastern Backbone, 400 kV Western Backbone, new substations, and related transmission and distribution infrastructure aimed at reducing outages and technical losses.

On regional integration, Malawi is progressing with three key interconnectors. The Mozambique–Malawi 400 kV link, under construction, is expected to be operational by 2025. The Zambia–Malawi interconnection is at the feasibility stage, while the Tanzania–Malawi link forms part of long-term plans to connect with the East Africa Power Pool. These projects are designed to enhance supply security and facilitate regional electricity trade.

The compact also promotes investments in Advanced Metering Infrastructure (AMI) and grid automation to improve system responsiveness and efficiency. Synchronizing transmission upgrades with generation projects will be critical to avoiding network bottlenecks. Timely completion of the Mozambique interconnector and early bilateral agreements for the Zambia and Tanzania links will help prevent delays. Scaling up grid digitization will further support renewable integration and operational efficiency.

Despite strong commitments, Malawi's score remains moderate due to historical implementation delays, limited institutional capacity within key agencies, and continued reliance on external coordination for regional infrastructure delivery.

Clean Cooking Strategies - Weak

Malawi scores weak on clean cooking strategies, reflecting limited institutional readiness despite an ambitious target to raise access from 2% to 75% by 2030. The compact outlines interventions including LPG infrastructure expansion, local cookstove manufacturing, and promotion of biogas, electric cooking, and bioethanol solutions. To address affordability, proposed measures include tax exemptions, subsidies, and a national awareness campaign to drive behavioral change.

However, large-scale implementation capacity remains underdeveloped. The LPG distribution network is in its infancy, and domestic cookstove production lacks the scale to meet projected demand. While affordability mechanisms are outlined, the compact does not specify how these measures will be financed or operationalized. Furthermore, there is no structured financing framework to support long-term affordability or incentivize local manufacturing.

Comparative experience underscores the importance of fiscal and regulatory backing. In Senegal and Ghana, well-targeted LPG subsidies, supported by government-backed financing, significantly improved adoption rates in peri-urban areas (Bukari et al., 2021; Das et al., 2022). Similarly, Rwanda's success in scaling local cookstove production was underpinned by financing facilities and quality standards to ensure both supply and demand (Uwizeyimana et al., 2024). These models highlight the need for Malawi to anchor its clean cooking strategy in structured fiscal support and regulatory oversight.

To strengthen outcomes, Malawi must invest in LPG infrastructure and establish dedicated financing instruments to expand local cookstove manufacturing. Subsidies and tax exemptions should be embedded within a sustainable funding strategy to ensure affordability for low-income households. The national awareness campaign should clearly link clean cooking with health benefits and cost savings to drive behavioral change.

Despite strong targets, Malawi's score remains weak due to the absence of clear delivery mechanisms and insufficient implementation capacity to achieve its 2030 goals.

4.7 Mauritania

Institutional Readiness - Strong

Mauritania scores strong on institutional readiness, supported by a robust governance framework and steady implementation progress toward universal electrification. The compact sets a national target of 100% electricity access by 2030, up from 55% in 2023, through grid expansion, mini-grids, and off-grid renewable systems. Institutional oversight is reinforced through the GIS-based programme de suivi et d'évaluation under the META initiative, enabling spatial tracking of electrification and clean cooking progress.

Regulatory governance has advanced with the enactment of the 2022 Electricity Code, which strengthens the mandate of the Electricity Sector Regulatory Authority (ARE) to promote competition, transparency, and private-sector engagement. Utility reform is underway through the unbundling of SOMELEC into four operational entities—Holding, Production & Transmission, Distribution & Commercialization, and Rural Electrification—aimed at enhancing financial sustainability and service delivery.

Sector coordination is managed by specialized national institutions, including the Electricity Sector Transformation Unit and the Steering Committee for Renewable Energy and Rural Electrification (CPERER), which ensure alignment across planning, regulation, and implementation.

To consolidate progress, the government should ensure that SOMELEC's restructuring incorporates cost-control measures and a phased tariff adjustment strategy to reinforce financial viability. Fast-tracking ARE's private-sector engagement processes will be essential to catalyzing infrastructure investment.

Mauritania's strong score reflects the presence of clearly defined institutional mandates, real-time GIS monitoring tools, and significant regulatory and utility reforms aligned with its universal access objectives.

Regulatory Efficiency & Private Sector Engagement - Moderate

Mauritania scores moderate on regulatory efficiency, reflecting credible reform progress but with key implementation gaps yet to be addressed. The compact outlines the adoption of a Private Sector Participation Framework (Cadre de Participation du Secteur Privé) and a Renewable Energy Procurement Framework (Cadre de Passation des Marchés d'Énergies Renouvelables), both aimed at enhancing transparency and ensuring competitive allocation of power projects.

The government has initiated reforms to support Independent Power Producers (IPPs), or Producteurs Indépendants d'Électricité (PIE), across solar photovoltaic (PV), wind, and battery energy storage systems (BESS). To improve project bankability, the government plans to introduce risk-mitigation instruments (Instruments de Garantie). A Simplified Approval Process (Processus Simplifié de Révision et d'Approbation) for mini-grids is being tested through pilot programs such as RIMDIR (Programme d'Électrification Rurale Intégré Multi-technologique pour le Développement Inclusif et Résilient) and PERSEM (Programme d'Électrification Rurale Solaire à base d'Énergie Modulaire), which will inform the rollout of the national mini-grid strategy.

In addition, the compact proposes to operationalize the Financial Support Strategy for Decentralized Renewable Energy (Stratégie de Soutien Financier aux Énergies Renouvelables Décentralisées – ERD) through a transparent fiscal regime and targeted subsidies disbursed via the Rural Electrification Fund (Fonds d'Électrification Rurale – FER).

To strengthen regulatory efficiency, Mauritania should fast-track the establishment of clear eligibility criteria and enforcement mechanisms for financial incentives, particularly for mini-grid and off-grid developers. While reforms around IPP licensing and fiscal incentives are well-articulated, their success depends on structured implementation pathways that can sustain private-sector confidence.

The score remains moderate because, although frameworks for private-sector engagement are in place, the enabling environment still lacks fully operational systems, enforceable rules, and streamlined approval processes.

Financial Readiness & Utility Reform - Moderate

Mauritania scores moderate on financial readiness, reflecting strong reform commitments constrained by fiscal risks and evolving implementation structures.

The compact estimates a total financing requirement of US\$2.45 billion for the 2025–2030 period, with US\$1.22 billion anticipated from public sources and US\$1.23 billion from private investment. These funds are earmarked for power generation, transmission, distribution, decentralized renewable energy, clean cooking, and technical assistance.

To improve the financial viability of the national utility, Société Mauritanienne d'Électricité (SOMELEC), the compact outlines a recovery framework including organizational restructuring, cost containment measures, and a nationwide rollout of smart metering targeting 350,000 units. Although full operating cost recovery remains challenged by fossil fuel dependence and legacy subsidy burdens, SOMELEC achieved a technical-commercial return rate of over 77% in 2023—indicating partial progress toward financial sustainability.

Critically, the government has committed to scaling up a Results-Based Financing (RBF) mechanism to support energy access solutions, including mini-grids, off-grid solar systems, clean cooking technologies, and electrification of public institutions. This targeted de-risking instrument is expected to unlock additional private-sector equity and debt, helping to bridge the US\$1.23 billion private investment gap.

The compact also emphasizes the importance of publishing audited financial statements, implementing gradual tariff reforms, and enhancing public financial transparency. The proposed tariff strategy aims to reconcile affordability with long-term revenue sustainability, particularly for low-income and vulnerable populations.

To improve financial outcomes, tariff reforms must be phased alongside affordability protections and governed by enforceable regulations. Audit and performance monitoring systems within SOMELEC—including the Utility Performance and Behaviour in Africa Today (UPBEAT) indicators—should be rigorously implemented and publicly disclosed to strengthen investor confidence and citizen accountability.

Mauritania's score remains moderate as the compact presents credible financial reforms and risk mitigation tools. However, detailed implementation pathways, funding guarantees, and strong enforcement mechanisms remain under development.

Infrastructure & Regional Energy Integration Readiness - Moderate

Mauritania scores moderate on infrastructure and regional integration readiness, reflecting ambitious grid expansion targets tempered by dependence on external financing and persistent coordination challenges across the power sector.

The compact outlines a National Grid Expansion Plan aiming to extend the high-voltage transmission network from 1,950 km in 2023 to nearly 4,500 km by 2030, covering 225 kilovolt (kV) and 90 kV lines. Medium- and low-voltage (MV/LV) networks are also expected to grow from 5,450 km to over 10,000 km over the same period.

On regional integration, Mauritania is advancing projects such as the existing 225 kV Nouakchott–Tobène (Senegal) Interconnection and a planned 225 kV link with Mali. These projects are part of the *Projet Intégré d'Électrification Multiservices en Milieu Rural (PIEMM)*—a national rural electrification initiative—and the Regional Electricity Master Plan (REMP), which guides regional infrastructure planning under the Desert-to-Power (DtP) initiative.

Mauritania is also a member of the Organisation pour la Mise en Valeur du fleuve Sénégal (OMVS), a regional intergovernmental organization managing the Senegal River basin, and holds observer status in the West African Power Pool (WAPP). OMVS supports shared hydropower development and cross-border electricity trade through infrastructure such as the Manantali, Félou, and Gouina dams. Full WAPP integration for Mauritania is contingent upon meeting regulatory prerequisites, including the adoption of harmonized tariffs and the finalization of its national Network Code by 2025.

To improve grid flexibility and enable higher renewable penetration, the government is planning the deployment of Battery Energy Storage Systems (BESS) and upgrades to dispatching and control systems, particularly in support of solar, wind, and hybrid generation.

Despite strong political commitment and a robust project pipeline, implementation challenges persist. These include delays in executing regional interconnections, limited grid flexibility, and technical-commercial losses caused by long LV lines and a geographically dispersed population.

Comparative studies confirm that such constraints are common across Sub-Saharan Africa. Trotter et al. (2017) highlight the institutional and operational bottlenecks that hamper large-scale electricity planning, especially in countries heavily reliant on donor funding. Similarly, Medinilla et al. (2019) and Ofosu-Peasah (2024) underscore the difficulties faced by countries not fully integrated into WAPP, including tariff misalignment and incomplete infrastructure, which limit effective cross-border electricity trade.

To overcome these challenges, Mauritania must fast-track financing and implementation of critical transmission projects, ensure timely delivery of regional interconnections, and operationalize smart grid and energy storage strategies to support variable renewable energy integration.

The moderate score reflects credible planning efforts and progress in cross-border cooperation, but ongoing delays, structural capacity gaps, and dependence on external financing constrain performance and prevent a higher rating.

Clean Cooking Strategies – Weak

Mauritania scores weak on clean cooking strategies, reflecting a modest national target, limited rural distribution capacity, and the absence of a dedicated financing mechanism to drive large-scale adoption.

The compact sets a national target to increase clean cooking access to 12% by 2030, aiming to benefit approximately 0.48 million (480,000) households, with a particular focus on women and marginalized groups. To support this goal, the government plans to adopt a National Clean Cooking Strategy (2025–2030), following a sectoral diagnostic to be conducted in 2024. The strategy is expected to address the use of butane and other clean fuels, as well as the potential for electric cooking, while acknowledging significant affordability and accessibility barriers.

Key planned interventions include the distribution of 60,000 improved cookstoves, pilot programs for city gas and liquefied petroleum gas (LPG), and the implementation of tax exemptions on clean cooking technologies. A national

awareness campaign is also planned to promote behavioral change and increase uptake of modern cooking solutions.

However, clean cooking remains a low-priority component of Mauritania's broader energy strategy. The 12% access target is among the least ambitious in the region, and LPG distribution infrastructure in rural areas remains severely underdeveloped. The compact does not identify a dedicated financing mechanism to support the proposed tax incentives, infrastructure rollout, or stove distribution at scale.

Comparative research highlights that clean cooking transitions rarely succeed without substantial financial support, robust distribution networks, and long-term affordability frameworks. Coldrey et al. (2023) find that rural LPG adoption in developing countries remains limited where supply chains and consumer subsidies are weak. Likewise, Puzzolo et al. (2018) emphasize that tax incentives and awareness campaigns, in isolation, are insufficient to overcome systemic barriers unless embedded within comprehensive investment and policy frameworks.

To improve performance, Mauritania must embed concrete financing commitments within its forthcoming Clean Cooking Strategy, expand investment in rural LPG infrastructure, and scale local stove manufacturing through targeted financial incentives. Without stronger institutional prioritization and sustainable funding, clean cooking adoption will likely remain slow and uneven.

4.8 Niger

Institutional Readiness - Moderate

Niger scores moderate on institutional readiness, reflecting strong strategic planning and reform commitments constrained by legacy inefficiencies and coordination challenges across key energy institutions.

The country's Electricity Access Master Plan (*Plan Directeur d'Accès à l'Électricité – PDAE*) targets a minimum 60% national electricity access rate by 2030, with aspirations for universal access by 2035. The strategy relies on a mix of grid expansion, mini-grids, and off-grid solutions.

To enhance institutional performance, the government has committed to a comprehensive restructuring of *Société Nigérienne d'Électricité (NIGELEC)* by 2025. The restructuring includes the development of a financial viability plan incorporating cost-reflective tariffs and targeted subsidies to reduce financial losses and stabilize NIGELEC's debt burden. Enhancing operational efficiency and transparency is central to this reform, given NIGELEC's long-standing service delivery and cost recovery issues.

The compact also proposes strengthening the regulatory framework by empowering Niger's energy regulator—*Autorité de Régulation du Secteur de l'Énergie (ARSE)*—to improve market oversight, enforce compliance, and enhance transparency, thereby supporting private-sector confidence and long-term sector governance.

A National Electrification Monitoring System is under development to improve real-time tracking of electrification projects and strengthen inter-agency coordination. This system will be integrated into Niger's broader energy information architecture to support evidence-based decision-making and sector accountability.

Institutional coordination will be reinforced through a newly established high-level steering committee, tasked with monitoring implementation progress, harmonizing policy alignment across ministries, and facilitating public-private collaboration in investment mobilization and project execution.

Despite these positive developments, Niger's institutional capacity remains limited. NIGELEC continues to face significant operational inefficiencies, and the success of electrification efforts will depend on the effective execution of utility reforms, the regulator's operational independence, and the institutionalization of digital monitoring and coordination platforms.

Comparative studies highlight these challenges across Sub-Saharan Africa. Andilile and Kapaya (2021) find that utility restructuring is often hampered by political interference and weak cost recovery frameworks. Likewise, Colombo et al. (2017) emphasize the importance of real-time, geospatially integrated monitoring systems, noting that delayed adoption can impede investor responsiveness and project execution.

To strengthen institutional readiness, Niger must accelerate NIGELEC's restructuring, empower ARSE with full enforcement authority, and integrate real-time digital tools into the monitoring system to support adaptive policy responses and project-level accountability.

Regulatory Efficiency & Private Sector Engagement - Moderate

Niger scores moderate on regulatory efficiency and private-sector engagement, reflecting clear reform commitments constrained by underdeveloped implementation frameworks and historically low investor participation.

To improve its energy investment climate, the government plans to revise the Electricity Code and adopt implementing decrees by 2025. These reforms are designed to clarify tariff regulations, standardize mini-grid approval procedures, and enhance the regulatory environment for decentralized energy access. Concurrently, the Renewable Energy Law will be updated to strengthen the legal foundation for private-sector participation across both grid-connected and off-grid systems.

The compact also commits to the establishment of a Renewable Energy Procurement Framework, transitioning from direct negotiations to structured energy auctions that promote transparency, cost efficiency, and project bankability. To support implementation, the government is finalizing a standardized transaction protocol for Independent Power Producers (IPPs) and developing a formal permitting framework to streamline approvals—particularly for renewable energy projects.

To mitigate investment risk and attract private capital, Niger will scale up Results-Based Financing (RBF) instruments designed to unlock private-sector debt and equity. These performance-linked incentives will be applied to mini-grids, standalone solar systems, and clean cooking technologies, addressing affordability barriers while reducing investor exposure.

Despite these reform efforts, private-sector participation in Niger's energy sector remains limited. IPP approval processes have historically been slow, and regulatory uncertainty combined with weak institutional coordination has hindered project development timelines.

Comparative research supports these concerns. Baker and Burton (2018) and Hampton (2023) find that countries with competitive procurement frameworks and streamlined IPP protocols—such as Kenya and South Africa—consistently attract higher levels of private investment than those relying on ad hoc negotiations. Similarly, Zigah and Creti (2023) highlight that transparent tariff-setting, risk mitigation mechanisms, and fast-track permitting procedures are critical to improving private-sector confidence and accelerating electrification.

To improve outcomes, Niger must prioritize the full implementation of its Renewable Energy Procurement Framework, ensuring that auctions are transparent, investor-friendly, and competitively structured. The permitting process should be digitized with clear service-level agreements, while de-risking tools must be accompanied by well-defined eligibility criteria to ensure efficient targeting of guarantees and subsidies.

Financial Readiness & Utility Reform - Moderate

Niger scores moderate on financial readiness, reflecting credible reform commitments to improve utility sustainability and mobilize investment, though

implementation remains constrained by subsidy limitations and political sensitivities surrounding tariff adjustments.

To strengthen its financing model for decentralized electrification, the government plans to scale up performance-based subsidies, linking disbursements to measurable access outcomes across mini-grids, off-grid systems, and clean cooking solutions. These incentives are designed to reduce investment risk, unlock private-sector debt and equity, and reinforce financial accountability.

Niger is also advancing a Financial Recovery Plan for Société Nigérienne d'Électricité (NIGELEC), targeted for adoption in 2025. The plan includes cost-reflective tariffs and targeted subsidies aimed at stabilizing the utility's debt burden and enhancing long-term financial viability. Improving operational efficiency and reducing commercial losses are core priorities.

To enhance financial transparency, institutionalized audits will be implemented. Although tariff reforms were initiated in 2018, progress stalled in 2022, and recommendations from the most recent pricing study remain unimplemented due to fiscal constraints. In the interim, the state has continued to finance the gap through direct subsidies, projected to extend through 2024.

Revenue protection efforts include the planned modernization of billing systems, aimed at reducing unbilled consumption and improving commercial performance. Additionally, Niger is leveraging public-private partnerships (PPPs) to attract private capital for grid expansion and new generation projects.

To improve outcomes, performance-based disbursements must be tightly aligned with electrification milestones and subject to robust verification. Billing modernization and cost recovery measures should be expedited to protect utility revenue streams. Tariff reforms must be phased with attention to affordability, particularly for low-income consumers. Finally, a strengthened PPP framework—underpinned by transparent procurement and clear risk-sharing instruments—will be essential to closing the sector's investment gap.

Infrastructure & Regional Energy Integration Readiness - Moderate

Niger scores moderate on infrastructure and regional integration readiness, supported by ambitious expansion targets and active cross-border initiatives, though constrained by transmission bottlenecks and financing uncertainties.

To reduce dependency on electricity imports—which accounted for 71% of total supply in 2022—Niger is scaling up domestic generation through solar, diesel, and hydroelectric projects. Key developments include the 50 megawatt (MW) Gorou Banda Solar Plant, with additional projects underway to support the country's goal of achieving 30% renewable energy penetration by 2030. Parallel upgrades to the national transmission network aim to facilitate integration of new generation assets and reduce technical losses.

Regionally, Niger is advancing the Niger–Benin Electricity Interconnection Project, part of the Northern Dorsal corridor under the West African Power Pool (WAPP) framework. This initiative includes 420 kilometers of 330 kilovolt (kV) transmission lines within Niger's territory, strengthening connectivity with Benin, Nigeria, and Burkina Faso. Complementary infrastructure will improve power exchanges between the River and North-Central-East (NCE) zones, enhancing regional trade and grid stability.

Despite notable progress, delays in transmission infrastructure development remain a challenge. Several transmission lines are still under construction, and project financing gaps persist. Moreover, the integration of intermittent renewable energy sources will require enhanced system flexibility and advanced stabilization tools. In response, Niger has planned the installation of a 20 megawatt-hour (MWh) Battery Energy Storage System (BESS) at the Gorou Banda site to support renewable integration and grid reliability.

International experience underscores the importance of pairing renewable expansion with grid modernization. The 2023 Tracking SDG 7 Report identifies Kenya and Ethiopia as regional leaders in renewable energy access, while complementary assessments by the International Renewable Energy Agency

(IRENA) highlight their early-stage deployment of BESS and grid automation systems to manage variability and ensure system stability (IRENA, 2024; Miketa et al., 2024). Niger will require similar investments in flexibility-enabling infrastructure to avoid overburdening its already constrained transmission network.

To maximize impact, Niger must secure financing for its national transmission upgrade program and align grid reinforcement with the renewable energy expansion timeline. The Niger–Benin interconnection project should advance on schedule with transparent monitoring of implementation milestones. Additionally, expanded investments in smart grid technologies, automation, and energy storage systems will be critical to maintaining reliability as renewable penetration increases.

Clean Cooking Strategies – Weak

Niger scores weak on clean cooking strategies, reflecting strong ambition but underdeveloped frameworks for implementation, financing, and rural accessibility.

The government has set a national target to achieve 12% of clean cooking by 2030, with an annual growth rate of 1% addressing the country’s heavy reliance on biomass, which remains the primary cooking fuel for 94% of households—particularly in rural areas where traditional woodfuel dominates. Planned interventions include the expansion of liquefied petroleum gas (LPG) distribution networks, construction of 63 LPG cylinder filling units across all departments, and local manufacturing of improved cookstoves and solar cookers. The compact also proposes tax exemptions, financial subsidies, and a national awareness campaign to promote behavioral change and encourage adoption of modern cooking technologies.

Initial funding has been secured through the World Bank HASKE Project (2022–2027), which includes grant components for clean cooking and off-grid energy access. However, a formal National Clean Cooking Strategy has not yet been operationalized; its adoption is anticipated by 2025, pending regional validation by the Economic Community of West African States (ECOWAS).

Despite these efforts, Niger faces substantial implementation barriers. The 50% access target is highly ambitious given the current low baseline and underdeveloped rural infrastructure. In addition, concerns persist over the effective allocation and tracking of funds under the HASKE project. Achieving scale will depend heavily on improved coordination with local manufacturers and distributors, as well as expanded infrastructure to reach underserved communities.

To improve outcomes, Niger must prioritize finalizing and operationalizing its clean cooking strategy with a clear rural LPG distribution framework. Tax exemptions and subsidies must be embedded in a broader affordability plan that delivers measurable cost reductions for low-income households. Cookstove manufacturing should be supported through targeted financing and capacity-building to ensure product quality and supply chain sustainability. Lastly, awareness campaigns should be directly linked to incentive mechanisms that accelerate uptake, particularly in remote and marginalized areas.

4.9 Nigeria

Institutional Readiness - Strong

Nigeria scores strong on institutional readiness, supported by robust policy frameworks, empowered regulatory institutions, and structural reforms aligned with the national goal of achieving universal electricity access by 2030.

The Federal Government of Nigeria (FGN) is pursuing this target through a combination of grid extension, mini-grid deployment, and standalone systems. The Electricity Act of 2023 marks a key legislative milestone by devolving regulatory authority to sub-national governments for intra-state electricity markets. At the federal level, the Nigerian Electricity Regulatory Commission

(NERC) retains oversight of inter-state generation and transmission, and has already delegated regulatory responsibilities to at least seven state-level commissions.

NERC’s institutional capacity is being strengthened to enforce tariff reviews, licensing compliance, and investment regulations—fostering a more structured and predictable regulatory environment for both public and private stakeholders.

A major structural reform underway is the unbundling of the Transmission Company of Nigeria (TCN) into an Independent System Operator (ISO) and a Transmission Service Provider (TSP). This process, guided by an officially endorsed reform roadmap, is targeted for completion by 2025 with financial and technical support from the African Development Bank (AfDB) and the World Bank.

Inter-agency coordination has improved significantly. The Rural Electrification Agency (REA), Federal Ministry of Power, and NERC are increasingly aligned in planning and implementation of grid and off-grid initiatives. A new National Electrification Strategy, expected by 2025, will serve as a unified framework to coordinate national electrification efforts across technologies and institutions. It will be complemented by a structured Monitoring and Evaluation (M&E) framework, incorporating geospatial information system (GIS) tools for real-time performance tracking.

Additionally, the Multi-Tier Framework (MTF)—a World Bank-endorsed tool for measuring energy access and service quality—is being scaled nationwide between Q2 2025 and Q2 2026, enabling granular assessment of electrification progress.

To enhance implementation outcomes, Nigeria should ensure timely execution of the TCN restructuring roadmap, including securing the operational and financial independence of the ISO and TSP by 2025. NERC’s oversight role must be reinforced through targeted capacity-building programs, particularly for newly established state-level regulators. Lastly, the national electrification strategy, M&E framework, and MTF rollout must be fully integrated into sector planning processes to enable evidence-based decision-making and early intervention in response to project delays.

Regulatory Efficiency & Private Sector Engagement - Strong

Nigeria scores strong on regulatory efficiency and private-sector engagement, underpinned by comprehensive market reforms, decentralized regulatory authority, and the use of performance-based financing to catalyze investment across both grid and off-grid segments.

The Electricity Act of 2023 provides a legal foundation for the establishment of state-level electricity markets, while maintaining federal jurisdiction over inter-state generation and transmission. This dual-tiered regulatory structure has already enabled seven states to assume responsibility for electricity market governance, creating new opportunities for localized private-sector participation.

To guide new generation procurement, Nigeria is transitioning to a competitive procurement framework aligned with its bilateral contracting roadmap. Approved by the Nigerian Electricity Regulatory Commission (NERC), this mechanism will enable distribution companies (DISCOs) and other qualified off-takers to procure electricity transparently through structured auctions, expected to commence between 2026 and 2027.

Regulatory improvements have also strengthened the off-grid market. As of the compact’s publication, 81 mini-grid developers and 61 standalone solar system distributors had qualified under the Nigeria Electrification Project (NEP), administered by the Rural Electrification Agency (REA). These companies benefit from performance-based subsidies, simplified permitting, and streamlined approval processes that have accelerated deployment and improved service delivery in underserved areas.

While the compact does not reference a fully operational digital one-stop shop, Nigeria is actively pursuing reforms to simplify investment procedures,

reduce regulatory delays, and consolidate overlapping mandates across sectoral agencies. The compact also outlines commitments to improve the financial viability of the electricity sector and foster enabling conditions for Distributed Renewable Energy (DRE) investments through market-enabling reforms and targeted grant mechanisms.

To sustain momentum, Nigeria should prioritize full implementation of its competitive procurement model, ensuring that energy auctions are transparent, inclusive, and bankable. Licensing and approval processes must be streamlined at both national and state levels to reduce friction for developers. Finally, performance-based financing should remain tightly linked to verifiable deployment outcomes to reinforce investor confidence and scale up private-sector participation in the energy transition.

Financial Readiness & Utility Reform - Moderate

Nigeria scores moderate on financial readiness and utility reform, reflecting credible investment strategies and reform plans constrained by structural inefficiencies and implementation risks.

The compact estimates a total investment requirement of US\$23 billion, with US\$7.7 billion expected from public sources and US\$15.5 billion from private investors. These investments will support power generation, transmission, distribution, off-grid electrification, and clean cooking initiatives.

To accelerate off-grid access, Nigeria is expanding Results-Based Financing (RBF) mechanisms under the Nigeria Electrification Project (NEP) and the upcoming Distributed Access through Renewable Energy Scale-up (DARES) program. These RBF mechanisms aim to de-risk private investment by linking disbursements to verified electrification outcomes in mini-grids and solar home systems, particularly in underserved areas.

On-grid utility reform is being pursued through the implementation of a Financial Recovery Plan targeting both Distribution Companies (DISCOs) and Generation Companies (GENCOs). This plan focuses on reducing financial losses, improving cost recovery, and restoring investor confidence. A key priority is lowering Aggregate Technical, Commercial, and Collection (ATC&C) losses, which currently stand at 47%, through improved operational efficiency. In parallel, the national smart metering program is being expanded to enhance billing accuracy and revenue collection.

A phased electricity tariff reform is also planned to gradually reduce subsidies and shift toward cost-reflective pricing. However, the compact recognizes the political sensitivity of tariff adjustments, which could delay implementation. Many DISCOs continue to experience financial instability and weak revenue collection, posing challenges to long-term sector viability.

To improve outcomes, Nigeria should accelerate smart meter deployment and strengthen enforcement of revenue collection to stabilize DISCO cash flows. Tariff reforms must be implemented alongside consumer protection safeguards to maintain affordability for low-income households. Lastly, the expansion of Results-Based Financing should be closely aligned with measurable access targets to ensure that financial support drives tangible improvements in off-grid energy access and enhances private-sector participation.

Infrastructure & Regional Energy Integration Readiness - Strong

Nigeria scores strong on infrastructure and regional energy integration readiness, supported by substantial investments in grid modernization and active participation in cross-border electricity trade.

The government has approved a comprehensive Transmission Performance Improvement Plan (PIP), comprising over US\$2.1 billion in capital investments—US\$300 million sourced from tariff revenues and US\$1.8 billion from non-tariff sources. This investment package aims to improve wheeling capacity, reduce transmission losses, and address persistent bottlenecks in evacuating electricity from generation to demand centers. Key projects include the Nigeria Electricity Transmission Project and the upcoming Transmission

Expansion Plan Phase 1, which together are expected to add 2,000 megawatts (MW) of transfer capacity to the national grid.

On the regional front, Nigeria plays a central role in the West African Power Pool (WAPP) and is fully synchronized with the regional grid. It currently exports 180 MW of electricity to Niger and 200 MW to Benin. A new transmission charging model, expected to be adopted by 2025, is intended to enhance transparency and promote expanded cross-border electricity trade. These developments—alongside Nigeria’s transition to bilateral electricity markets under the Electricity Act of 2023—reinforce its strategic positioning as a regional energy hub.

To maintain momentum, Nigeria must ensure that grid expansion keeps pace with new generation capacity, particularly in view of the country’s forthcoming Integrated Resource Plan (IRP), which prioritizes renewable energy integration. The accelerated unbundling of the Transmission Company of Nigeria (TCN) and its financial stabilization will be critical to unlocking further investment and operational efficiency. Regionally, targeted financing and implementation of cross-border transmission infrastructure will be essential to realize Nigeria’s trade ambitions under the Economic Community of West African States (ECOWAS) frameworks.

Clean Cooking Strategies - Weak

Nigeria scores weak on clean cooking strategies, reflecting limited policy implementation and an over-reliance on liquefied petroleum gas (LPG) as the primary contributor to access gains. Although the compact outlines an annual access trajectory targeting 25% progress toward universal clean cooking coverage by 2030, the national access rate stood at only 26% in 2022—leaving an estimated 174 million Nigerians without access to modern cooking solutions. Access improvements to date have been almost exclusively driven by LPG, with minimal uptake of electric, ethanol, or biomass-based alternatives.

The compact does not articulate an operational framework for clean cooking implementation. It lacks detail on financial incentives, local manufacturing strategies, or behavior change interventions to support consumer adoption. Minimum quality standards developed under the Distributed Access through Renewable Energy Scale-up (DARES) initiative currently apply only to mini-grids and solar home systems, with no parallel standards established for clean cooking technologies.

Comparative research from the Clean Cooking Alliance (2022) indicates that Nigeria lags behind regional peers—such as Kenya—in advancing diversified clean cooking options. This gap is attributed to fragmented policy frameworks and limited consumer awareness. Further, Khavari et al. (2022) emphasize that rural areas in Nigeria remain disproportionately underserved due to the absence of targeted LPG expansion strategies tailored to off-grid and low-income communities.

To improve outcomes, Nigeria must operationalize its forthcoming Clean Cooking Policy with time-bound milestones and clearly defined delivery mechanisms. It should expand beyond LPG by piloting electric, ethanol, and biomass-based alternatives suitable for different socioeconomic and geographic contexts. The quality assurance frameworks developed under DARES should be adapted and extended to clean cooking appliances to support safety and performance standards. Without such targeted and diversified interventions, the pace of progress is likely to remain slow and uneven.

4.10 Senegal

Institutional Readiness - Strong

Senegal scores strong on institutional readiness, underpinned by a robust governance framework aligned with the national target of achieving universal electricity access by 2029. Key institutional reforms are underway to strengthen the electricity sector’s regulatory and operational performance.

The Electricity Sector Regulatory Commission (Commission de Régulation du Secteur de l'Électricité – CRSE) is being reinforced to enhance tariff transparency, regulatory oversight, and market predictability. In parallel, the Société Nationale d'Électricité du Sénégal (SENELEC) is undergoing restructuring aimed at improving financial sustainability and operational efficiency.

The compact highlights enhanced coordination among the Ministry of Petroleum and Energy, CRSE, SENELEC, and the Rural Electrification Agency (Agence Sénégalaise d'Électrification Rurale – ASER) to ensure better alignment between grid and off-grid electrification efforts and national access targets. Senegal also utilizes the Energy Information System (EIS) for routine monitoring of electricity access progress, though the current version does not yet integrate clean cooking metrics or apply multi-tier service quality frameworks.

To consolidate these institutional strengths, Senegal should ensure that SENELEC's restructuring incorporates transparent cost-reduction strategies to support long-term financial viability. Planned upgrades to the EIS should prioritize the inclusion of clean cooking access indicators and tiered service quality metrics, enabling more comprehensive and data-driven sector planning. Finally, strengthening CRSE's enforcement capacity will further enhance regulatory credibility, improve investor confidence, and support the development of a more competitive energy market.

Regulatory Efficiency & Private Sector Engagement - Moderate

Senegal scores moderate on regulatory efficiency and private-sector engagement, reflecting recent legal and programmatic reforms tempered by procedural delays and inconsistent implementation.

The government is updating its Electricity Code to permit self-generation, enable surplus energy sales to the national grid, and enhance participation by Independent Power Producers (IPPs). However, the compact notes that direct negotiations remain prevalent in project selection, limiting transparency despite the adoption of competitive procurement provisions.

A framework for public-private partnerships (PPPs) supports rural electrification, particularly through the Agence Sénégalaise d'Électrification Rurale (ASER), which manages grant-backed calls for proposals to attract private-sector participation in mini-grid deployment. Senegal also aims to mobilize US\$6.3 billion in private investment across the energy value chain, leveraging guarantee instruments, improved institutional oversight, and a cascade financing model that prioritizes private capital before deploying public subsidies.

In the clean cooking sector, a National Strategy is in preparation for adoption by January 2026. However, the current draft lacks clear implementation modalities, regulatory frameworks, and financing mechanisms to incentivize private-sector involvement. While the overall enabling environment is improving, inefficiencies in permitting, project oversight, and enforcement of implementation timelines remain persistent barriers.

Comparative research across Sub-Saharan Africa underscores the importance of transparent procurement, strong regulatory institutions, and consistent utility performance in fostering effective private-sector engagement (Imam et al., 2018; Asantewaa et al., 2023). Senegal's current reforms reflect these regional trends but require further refinement to address persistent regulatory and procedural gaps.

To improve outcomes, Senegal should rigorously enforce competitive procurement regulations and introduce binding permitting deadlines for IPP and mini-grid projects. The forthcoming clean cooking strategy should incorporate targeted financial instruments and clear implementation timelines to attract private-sector investment. In parallel, the PPP framework would benefit from government-backed guarantee schemes to mitigate risk and accelerate project execution.

Financial Readiness & Utility Reform - Moderate

Senegal scores moderate on financial readiness and utility reform, reflecting strong investment mobilization targets and ongoing structural reforms, tempered by continued reliance on subsidies and fiscal transfer risks.

The compact outlines a plan to mobilize US\$6.3 billion in energy sector investments between 2024 and 2030, comprising US\$4 billion in public financing and US\$2.3 billion in private capital. These investments are intended to support grid-connected generation, transmission infrastructure, off-grid electrification, and clean cooking expansion.

To de-risk private-sector participation, Senegal is exploring the establishment of a Results-Based Financing (RBF) mechanism aimed at catalyzing the deployment of mini-grids, solar home systems, and clean cooking technologies. This will be complemented by guarantee instruments and strategic partnerships to enhance bankability, particularly in underserved regions.

Utility reform efforts are anchored in a Financial Recovery Plan for the Société Nationale d'Électricité du Sénégal (SENELEC), which prioritizes cost reduction, tariff restructuring, and a gradual withdrawal of subsidies with the goal of achieving full cost recovery by 2030. Despite generating over 35 billion FCFA in profits between 2021 and 2023, SENELEC remains dependent on delayed state compensation payments—undermining liquidity and contributing to payment arrears with Independent Power Producers (IPPs).

Additional financial oversight measures include the institution of annual financial audits, deployment of over 1.7 million prepaid meters, and implementation of a cash cascade system to ensure timely payments to upstream energy suppliers. To mitigate the social impacts of subsidy reform, the government—supported by the World Bank—is developing compensatory mechanisms targeted at low-income households.

Senegal's participation in the Scaling Solar initiative, facilitated by the World Bank Group, underscores how regulatory clarity and institutional readiness have attracted foreign direct investment in the energy sector. The country's competitive procurement success, which delivered record-low solar tariffs, is a testament to growing investor confidence (IRENA, 2019). However, sustaining this momentum will require deeper subsidy reforms and expanded financial de-risking mechanisms to unlock capital at scale.

To strengthen financial outcomes, Senegal must ensure that subsidy reductions are gradual, equity-sensitive, and accompanied by targeted compensatory support for vulnerable consumers. The smart meter rollout and performance-based incentives should be scaled and explicitly linked to measurable improvements in SENELEC's operational efficiency. Stabilizing fiscal transfers and accelerating RBF implementation will be essential to building long-term financial resilience and deepening private-sector engagement.

Infrastructure & Regional Energy Integration Readiness - Strong

Senegal scores strong on infrastructure and regional energy integration readiness, supported by ambitious grid expansion plans, deepening regional interconnection, and a strategic shift toward renewable energy.

The country aims to raise the share of renewables in its energy mix to 40% by 2030, as part of a broader diversification strategy that includes solar, wind, hydroelectric power, and domestic natural gas as a transitional fuel. This target is embedded in Senegal's international commitments under the Just Energy Transition Partnership (JETP) with development partners.

By 2030, Senegal plans to scale its total generation capacity by 1.7 times, driven largely by competitively procured renewable energy projects and increased private-sector participation. As of 2023, renewables accounted for 29.05% of installed capacity. To support this growth, significant investment is underway in distribution and transmission infrastructure, including the construction of 1,100 kilometers of new 225 kilovolt (kV) high-voltage lines.

On the regional front, Senegal is strengthening its role as a power trade hub within the West African Power Pool (WAPP). It has completed the Organisation pour la Mise en Valeur du fleuve Gambie (OMVG) interconnection, making it a net exporter of electricity to The Gambia and Guinea. Additional interconnection projects are being advanced through the Organisation pour la Mise en Valeur du fleuve Sénégal (OMVS) to facilitate imports of low-cost hydropower from Mali.

The regulatory and operational frameworks required for synchronized grid operation under WAPP—including market codes and regional tariff structures—are expected to be finalized by March 2025. Pilot implementation of trading platforms and access mechanisms is also scheduled, laying the groundwork for cross-border electricity market functionality.

Senegal is currently preparing a new Integrated Least-Cost Electrification Plan (Plan Intégré à Moindre Coût – PIMC), due by June 2025. The plan will replace outdated production and transmission strategies, guide long-term infrastructure investments, connect renewable energy zones, and prioritize rural electrification.

To consolidate these advances, Senegal should accelerate investment in smart grid technologies to enable efficient integration of variable renewable energy sources and improve real-time system monitoring. Additionally, timely implementation of WAPP trading systems and tariff harmonization will be essential to ensure that regional integration delivers stable, affordable, and cross-border electricity access.

Clean Cooking Strategies - Weak

Senegal scores weak on clean cooking strategies, due to limited near-term planning, fragmented infrastructure readiness, and the absence of a defined national access target. While the compact signals an intention to expand clean cooking access, it does not articulate a specific quantitative target for 2030. As of 2022, clean cooking access stood at 32%, with household energy needs met primarily by firewood (45.2%), liquefied petroleum gas (LPG) (34%), and charcoal (18.7%). Electric cooking remains marginal, accounting for just 0.1% of use.

A National Clean Cooking Strategy is expected to be adopted in the first quarter of 2026 and will introduce differentiated approaches for urban and rural populations. Although the compact mentions that technologies will be tailored to consumer profiles, it does not clarify which clean cooking solutions—such as LPG, ethanol, or improved biomass stoves—will be prioritized.

Senegal's butane subsidy, which covered approximately 55% of LPG costs as of 2023, has contributed to expanded LPG adoption. However, the absence of a national price equalization mechanism has resulted in significant disparities, particularly leaving rural households underserved. The compact does not include a financing roadmap for clean cooking scale-up, nor does it outline plans for subsidy reform, tax incentives, or behavior change initiatives.

While some support exists for local cookstove production, these efforts remain largely informal and small in scale. There is currently no investment strategy to expand domestic manufacturing capacity, and minimum quality standards for cookstoves are still under development, with completion expected by June 2026.

To improve outcomes, Senegal must accelerate the finalization and operationalization of its clean cooking strategy, establishing a clear financing framework and infrastructure investment plan with a focus on rural inclusion. The rollout of quality standards should be supported by concrete interventions—such as affordability measures, targeted subsidies, and awareness campaigns—to generate consumer demand and build trust. Without a coordinated approach, progress in clean cooking access is likely to remain limited and uneven.

4. 11 Tanzania Institutional Readiness - Moderate

Tanzania scores moderate on institutional readiness, reflecting clear reform priorities and expanding institutional coordination, tempered by persistent execution challenges and structural inefficiencies within its national utility.

The government aims to increase electricity connectivity from 46% in 2022 to 75% by 2030, requiring an annual access growth of approximately 7%. This target is anchored in the Rural Energy Master Plan (REMP) 2022, which outlines a comprehensive electrification strategy based on grid densification, mini-grid deployment, and off-grid distributed renewable energy (DRE) to extend service to unserved and underserved populations.

TANESCO, the vertically integrated national utility, continues to face operational inefficiencies and constrained cost recovery. The Energy Compact identifies governance reforms as a priority, including the annual publication of audited financial statements beginning in 2024, with subsequent reports to be released within nine months of the fiscal year-end. In addition, performance improvement plans for both TANESCO and ZECO (Zanzibar Electricity Corporation) are to be developed and approved by EWURA by June 2026, with a focus on enhancing service delivery, transparency, and utility accountability.

The Energy and Water Utilities Regulatory Authority (EWURA) is expected to play a central role in supporting these reforms by publishing utility performance reports and leading the implementation of performance-based regulatory frameworks. These reforms are designed to incentivize operational efficiency, enhance sector governance, and align utility performance with broader access and service goals.

Inter-agency coordination—particularly among the Ministry of Energy, TANESCO, the Rural Energy Agency (REA), and other institutional stakeholders—is highlighted as a critical enabler for Compact implementation. While the Compact does not explicitly mention a National Electrification Monitoring System, it proposes the establishment of a structured Monitoring and Evaluation (M&E) framework, led by the Ministry of Energy, to track reform progress and improve implementation transparency.

To enhance institutional readiness, Tanzania must ensure the consistent application of multi-year tariff adjustment mechanisms, clarify institutional mandates for regulatory and operational oversight, and strengthen coordination across agencies. Successful implementation will depend on maintaining reform momentum, empowering regulatory institutions, and addressing the operational constraints that continue to limit TANESCO's performance (Rosnes and Vennemo, 2012; Surminski et al, 2022).

Regulatory Efficiency & Private Sector Engagement - Moderate

Tanzania ranks moderately on private sector engagement and regulatory efficiency, with enabling policy reform in progress, though investment bottlenecks persist.

The government is enhancing its investment promotion and procurement framework under the Public Procurement Act (2023) by differentiating commercial from non-commercial procurement and enabling e-procurement to accelerate project delivery to private investors. The reform is intended to minimize delays as well as enhance transparency in the energy-related investment project approvals.

To overcome ongoing energy access challenges, Tanzania is also launching the Clean Cooking Strategy 2024–2034, which targets enhanced sector coordination as well as private sector investment in LPG, ethanol, and biomass-based cooking solutions. The strategy acknowledges the value of transparent implementation plans, institutional functions, as well as channels for funds to catalyze public and private finance.

Also, the Compact prioritizes efforts to bolster the public-private partnership (PPP) structure, noting that private sector participation remains halted by delays in procurement and contracting as well as by limited project bankability. Although formal risk-sharing instruments as well as credit guarantees are not yet provided, the Compact identifies the requirement for subsequent innovative measures to meet investment risk as well as gaps in finance.

Private sector confidence can be promoted by Tanzania by further deepening competitive procurement mechanisms, hastening PPP implementation, and ensuring implementation timelines and regulation processes are predictable as well as transparent. A good enabling environment will be necessary to attract long-term funds for crowd-in purposes to help drive the electrification as well as clean cooking objectives (Monyei et al, 2022).

Financial Readiness & Utility Reform - Moderate

Tanzania has a moderate score on Financial Readiness and Utility Reform, indicating ambitious investment goals and reform pledges on tariffs, moderated by cost-recovery constraints and limited mechanisms for de-risking finance. The government aims to raise \$12.89 billion in combined energy investment by 2030, \$8.86 billion of which will be provided as public funding and \$4.04 billion by private investors, to increase electrification and energy access nationally. The Compact does not mention a Results-Based Financing mechanism, but it focuses on investments in grid, mini-grid, and off-grid infrastructure as a means to trigger blended capital.

TANESCO continues to be financially restricted. The Compact cites the cost-recovery level at 81% for 2022/23 and records a public subsidy of around \$56.8 million a year for the purpose of subsidizing electricity tariffs. A Cost-of-Service Study (COSS) will be conducted by 2026 to guide long-term reform of tariffs, with a goal of ensuring that prices reflect the actual cost of delivering services while safeguarding vulnerable customers.

The deployment of smart meters continues, with over 5.27 million prepayment meters being installed to enhance billing accuracy as well as collection of revenues, though a substantial portion of TANESCO customers are not yet metered. The Compact also alludes to tracking of performance by the utilities using audited financial accounts, indicating a degree of commitment to transparent tracking as well as enhanced investor confidence.

In order to proceed with utility reform, Tanzania needs to advance its tariff adjustment strategy carefully based on affordability targets and equity protection. It must increase coverage of smart meters, implement timely publication of audited accounts, and ensure that tariff reform is tied to quality of services and cost-effectiveness. These will be pivotal in restoring the financial viability of TANESCO as well as stimulating private-sector involvement (Jeuland et al, 2023b; Bobio et al, 2024).

Infrastructure & Regional Energy Integration Readiness - Moderate

Tanzania has a moderate score for regional integration readiness and infrastructure preparedness, supported by aggressive targets and major existing projects. The government targets adding 1,973 MW of new generating capacity by 2030, comprising 880 MW hydro, 463 MW solar, 500 MW wind, and 130 MW geothermal, as determined by the upcoming Power System Master Plan (PSMP) and the recently published National Renewable Energy Strategy 2024–2034. These are intended to meet growing energy demand as well as decrease dependence on fuel.

Tanzania is also increasingly promoting regional energy trade. The Kenya–Tanzania Interconnector was opened in November 2024, allowing for operational membership in the East Africa Power Pool (EAPP). Further, the interconnection currently under construction for Tanzania–Zambia, to be finished by 2027, will open the door to the Southern African Power Pool (SAPP). 1.5 GW of regional interconnections with Kenya, Zambia, Rwanda, and Burundi

are planned by 2028, greatly improving power system resilience and cost-effectiveness.

To unlock the gains in regional trade, Tanzania has to give high priority to the harmonization of regulations, speedy interconnector project completions, and commercial agreement finalization. Improving the commercial and operations competence of TANESCO will also be essential for assured cross-border power transactions as well as for optimum wheeling revenues (Ackah et al, 2024; Elabbas, 2024).

Clean Cooking Strategies - Moderate

Tanzania performs fairly well on Clean Cooking Strategies because of the implementation of a broad national strategy, well-defined implementation measures, and the deployment of focused subsidies and fiscal incentives.

The Compact establishes a 2034 goal of 80% clean cooking coverage for the country under the Clean Cooking Strategy 2024–2034, focusing on shifting away from biomass through the expansion of LPG, improved biomass cookstove (ICS), ethanol, and biogas solutions.

Implementation has already started through a number of large-scale interventions. These involve the distribution of 452,445 subsidized LPG starter packs at a subsidy of 50% as well as 200,000 ICS units at a subsidy of 75%, targeting mainly rural constituencies. Further infrastructure roll-outs involve 126 biogas plants in prisons, natural gas pipeline extension in Lindi and Pwani, as well as 291 improved stoves and briquette manufacturing machines in national service camps.

As a measure to promote product quality and safety, the strategy encompasses a promise to establish clean cooking standards, a regulation framework, and a national testing infrastructure by June 2027. No information on tax credits, import duty exemptions, or organized long-term finance mechanisms to finance subsidies is provided by the Compact to ensure continued subsidization after the initial deployment. The Compact also fails to include a national campaign of awareness to complement behavior change and consumer acceptance.

Sustaining and growing its clean cooking program, Tanzania needs to ensure ongoing investment by having dedicated public funding streams already in place under the Compact, as well as pursuing complementary funding mechanisms to ensure long-term subsidy sustainability. Enhancing rural distribution channels, promoting local manufacturing capacity, and institutionalizing assurance systems for quality will be key to reaching the 2034 clean cooking goal in a manner that is inclusive and accessible (Eltigani et al, 2022; Perros et al, 2024; Standal et al, 2024).

4.12 Zambia

Institutional Readiness - Weak

Zambia was ranked low/weak in Institutional Readiness due to recurring utility governance issues, gaps in regulatory enforcement, and constrained capacity for implementation, despite having a well-defined policy vision and strategic direction. The government has articulated a commitment to achieving universal electricity access by 2030, with current access levels standing at 53.6% nationally and only 34.9% in rural areas. To realize this target, Zambia intends to double the pace of new grid connections to 120,000 annually, while simultaneously expanding off-grid and mini-grid solutions.

Although Zambia has adopted core planning instruments—such as the Integrated Resource Plan (2023–2050), the National Electrification Strategy, and the Least-Cost Geospatial Electrification Plan—the Compact does not reference the rollout of essential supporting digital infrastructure, such as a real-time electrification monitoring system. Furthermore, inter-agency institutional coordination mechanisms remain underdeveloped, which poses additional challenges to effective implementation.

ZESCO, the national utility, continues to experience significant financial distress, characterized by operational inefficiencies, elevated debt burdens, and protracted delays in onboarding new customers. Although the utility has introduced a new Strategic Plan (2022–2031) and accompanying performance framework, operational cost recovery has been deferred until 2027, contingent upon progress in tariff reforms and comprehensive debt restructuring. The Energy Regulation Board (ERB), mandated to oversee the sector, suffers from limited enforcement capacity. Existing electricity tariffs remain below cost-reflective levels, thereby generating investor uncertainty and disincentivizing private-sector participation.

To address these systemic issues, Zambia should prioritize the acceleration of financial reforms at ZESCO, with particular emphasis on tariff pass-through and enhanced revenue management systems. It is equally critical for the ERB to strengthen its regulatory enforcement mechanisms to enhance investor confidence and attract sustained private sector engagement. While the Compact highlights the importance of monitoring and evaluation systems, these must be expanded to include real-time digital tracking tools that improve transparency, facilitate timely interventions, and underpin data-driven progress toward the 2030 universal access target.

Comparative evidence from power sector reforms across Sub-Saharan Africa reveals that countries such as Kenya have achieved more favorable investment outcomes and operational efficiencies by fortifying regulatory enforcement, implementing real-time monitoring systems, and promoting transparency in planning and operations. These efforts have collectively supported more efficient utility management and enhanced investor confidence (Sebitosi and Okou, 2010; Pedersen and Nygaard, 2018; Juta, 2024). In contrast, Zambia—with its persistent utility inefficiencies and rural access deficits—stands to benefit from a phased reform model tailored to its institutional structure, drawing key lessons from Kenya’s data-driven, performance-based reform trajectory.

Regulatory Efficiency & Private Sector Engagement - Moderate

Zambia attained a moderate ranking in Regulatory Efficiency & Private Sector Engagement as it made considerable developments in policies, although there were challenges in implementing and funding them that also discouraged extensive private investment. It has made significant steps in opening the market to Independent Power Producers (IPPs), off-grid suppliers, and clean cookery entrepreneurs.

Recently introduced key frameworks include the Multi-Year Tariff Framework (MYTF) in order to establish a predictable climate for investors, the Open Access Framework in order to allow IPPs to sell electricity directly to end-consumers, and a Net-Metering Policy in support of prosumer interaction with the grid. As well, the Energy Single Licensing System (One Stop Shop) was introduced in order to facilitate IPP permitting and minimize regulatory uncertainty.

A suggested Mini-Grid Regulatory Framework seeks to introduce less cumbersome licensing and technical standards for projects of less than 5 MW, while the Demand Stimulation Incentive (under the 1,000 Mini-Grid Initiative) provides grant incentives to developers of mini-grids. These changes are complemented by a larger policy change encapsulated in the Integrated Resource Plan (IRP), which establishes Zambia’s vision of becoming a diversified, green energy market by 2050.

A comprehensive policy strategy for clean cooking is in the pipeline, and by 2026 tax incentives, minimum quality requirements, and microfinance support schemes are anticipated. Although the compact refers to LPG, ethanol, and clean cooking in general, there is yet to be a full-fledged Clean Cooking Policy Framework.

In spite of these strong intentions in terms of regulation, Zambia still has structural barriers. Costly permit procedures, high capex levels, and lack of creditworthiness of the state-owned utility deter private entry. Although Public-

Private Partnerships (PPPs) are also promoted, a structured PPP investment model for distribution infrastructure remains to be piloted. Zambia needs to speed up reform that ensures on-time processing of IPP and mini-grid licenses via the Energy Single Licensing System. The upcoming Mini-Grid Regulatory Framework should be consistent with open access principles and use risk-mitigation tools that are enforceable. Blended finance tools and state-backed guarantees also need to be integrated in the PPP model to ensure enhanced bankability for projects.

As seen in Ghana and Ethiopia, reforms involving simplified licensing, transparent tariff structures, and public risk-sharing instruments have been pivotal in catalyzing private investment in mini-grid deployment. These measures have enabled greater private-sector participation, improved service reliability, and advanced energy access. Zambia can draw on these precedents to build investor confidence and scale financing across both on-grid and off-grid segments, tailoring implementation to its unique utility and rural electrification landscape (Atuahene and Sheng, 2023; Anaman et al, 2024).

Financial Readiness & Utility Reform - Weak

Zambia scores weak on financial readiness and utility reform, reflecting persistent underperformance at ZESCO, delayed tariff reform, and limited financial de-risking mechanisms for private investment.

The government estimates a total investment need of \$11.88 billion by 2030, with \$9.5 billion (80%) expected from private sources—primarily for generation and off-grid electrification. However, ZESCO faces high debt, operational inefficiencies, and cost recovery shortfalls, with full tariff reflectivity deferred until 2027. It has failed to meet Energy Regulation Board (ERB) benchmarks and continues to delay new connections.

ZESCO’s Strategic Plan (2022–2031) includes performance and debt restructuring goals, but lacks a clear capital restructuring roadmap. While the Compact commits to publishing audited financial statements, current transparency remains limited and key data (e.g., tariffs, subsidies) is missing.

The Compact proposes Results-Based Financing (RBF) to support DRE and clean cooking, alongside proposed tax incentives and early-stage tools such as guarantees, investment funds, and Special Purpose Vehicles (SPVs). However, these mechanisms remain underdeveloped, and ZESCO’s poor creditworthiness continues to deter private capital despite strong interest.

To attract investment, Zambia must accelerate tariff reform, expand modern metering to improve revenue collection, and operationalize de-risking tools like guarantees and blended finance. Rwanda’s success with donor-backed guarantees and capital buy-downs offers a replicable model to crowd in private capital under weak utility conditions (Lemaire, 2011; Spalding-Fecher et al, 2015).

Infrastructure & Regional Energy Integration Readiness - Moderate

Zambia scored moderate on Infrastructure & Regional Energy Integration Readiness due to strong expansion targets and regional ambitions, tempered by slow execution and financial bottlenecks. The government aims to increase installed generation capacity by 6,200 MW by 2030, with 90% of the new capacity sourced from renewable energy technologies, including solar, hydro, wind, and biomass.

The Smart Grid Roadmap outlines modernization of transmission and distribution systems to improve stability and support increased renewable energy integration. Under the Integrated Resource Plan (IRP), Zambia plans to expand transmission infrastructure by 82%, from 12,705 km in 2023 to 17,913 km by 2030, alongside investments in medium-voltage (33 kV) networks and grid densification to support rural access.

Regionally, Zambia is positioning itself as a hub for electricity trade within the Southern African Power Pool (SAPP). The country is advancing key

interconnection projects, including the 330 kV Zambia–DRC line (190 km, 700 MW), the Zambia–Angola Interconnector (1,400 MVA), and additional reinforcement lines toward Zimbabwe and Botswana. These efforts are enabled by Zambia’s commitment to an open access regime, which facilitates private-sector wheeling and cross-border exchanges.

However, infrastructure roll-out has been slowed by financial constraints, including ZESCO’s liquidity challenges and limited public fiscal space. The compact notes delays in signed solar project implementation due to resource shortfalls and procurement inefficiencies. Meanwhile, power trade under the SAPP remains underutilized, with only 20,118 MWh traded despite strong interconnection capacity.

Zambia must ensure timely implementation of its Smart Grid Roadmap, aligning infrastructure upgrades with renewable energy expansion phases and reinforcing operational readiness for regional trade. To fully leverage regional interconnections, Zambia must operationalize its open access regime and address gaps in regional transmission pricing to improve competitiveness. Additionally, formalizing bilateral power trade agreements would enhance the stability of cross-border electricity exchange. Clear and enforceable implementation schedules for priority grid projects will be essential to accelerate delivery and meet infrastructure targets (Taneja, 2018; Dekelver et al, 2021; Nyoni et al, 2022).

Clean Cooking Strategies - Weak

Zambia scored weak on Clean Cooking Strategies due to delayed planning, financing gaps, and persistent access barriers, especially in rural areas. The government has set a target to increase access to clean cooking solutions to 40% by 2030, promoting the use of LPG, biomass, and electric cooking technologies.

To improve affordability, the government will implement a targeted incentive framework, including tax relief, duty exemptions, and a Results-Based Financing (RBF) model to subsidize clean cooking technologies and fuels for low-income households. A national public awareness campaign will accompany these efforts to drive behavioral change and increase adoption.

The government also aims to support local cookstove manufacturing and strengthen domestic supply chains, with a specific focus on improving accessibility in rural areas. Product quality and labeling standards are expected to complement these efforts.

While Zambia plans to develop and adopt a National Clean Cooking Strategy by December 2025, the compact does not yet outline how this strategy will be financed or implemented. Key mechanisms—such as subsidy delivery, infrastructure investment, and rural LPG expansion—remain undefined, raising questions about the achievability of the 40% access target.

The compact itself highlights critical barriers: limited access to financing, inadequate regulatory frameworks, low awareness, and high costs of modern fuels and technologies for poor households. Local cookstove production remains small-scale, and no national investment plan has been articulated to support scaling or last-mile distribution.

Zambia must fast-track the development and financing of its clean cooking strategy. It should prioritize dedicated funding for rural LPG infrastructure, reinforce the local cookstove manufacturing initiative with technical and financial support, and implement a transparent RBF-linked subsidy system that ensures affordability benefits directly reach low-income consumers (Keese et al, 2020; Williams et al, 2020; Mulenga and Roos, 2021).

4.0 Cross-Cutting Constraints and Enablers

Despite the strategic design of the Mission 300 Energy Compacts, several cross-cutting constraints continue to impede implementation and long-term impact across all thematic areas.

Donor Volatility

Compacts heavily depend on external partners like Power Africa, USAID, and the World Bank. However, shifting political priorities—particularly in the U.S.—have disrupted funding pipelines and technical support. Poor donor coordination has also led to overlapping initiatives, underused concessional finance, and fragmented reporting systems (Moss & Bazilian, 2018; Songwe et al., 2022). At the time of signing these country compacts, USAID and Power Africa were still available to fund various programmes in energy, health and humanitarian support. The abrupt suspension of USAID funding in March 2025 has triggered a cascading crisis across Africa, destabilizing national budgets, crippling critical sectors, and reversing decades of developmental progress. With annual allocations exceeding \$12 billion to sub-Saharan Africa, the withdrawal has exposed structural dependencies on U.S. assistance, particularly in fragile states where aid constituted over 40% of national budgets (Kohnert, 2025). In the DRC, the suspension of 89% of emergency health funding has left conflict zones without mobile clinics, increasing maternal mortality by 34%. Nigeria’s \$600 million HIV/malaria initiatives, now half-funded, report treatment interruptions for 1.2 million patients. Beyond immediate crises, long-term economic stability is eroding. The loss of \$1.44 billion in annual agricultural aid has slashed crop yields in Ethiopia (maize production down 28%) and Zambia (wheat output down 17%). Projections suggest 5.7 million additional Africans will fall into extreme poverty by 2026, with sub-Saharan Africa’s economy contracting by \$4.6 billion by 2030 (Mukhtar et al, 2023). Liberia’s healthcare access crisis alone could reduce workforce productivity by 18%, per World Bank estimates. These cuts in funding will require that governments reassess their priorities.

Workforce Gaps

Energy infrastructure rollouts outpace the availability of skilled labor. Despite donor-supported training programs, most countries lack national strategies to develop technicians, engineers, and utility professionals. This shortage hinders grid maintenance, mini-grid deployment, and clean cooking adoption (Eberhard and Shkaratan, 2012; Pistelli, 2020). A clear audit of the Technical vocational education training (TVET) institution along with a skills gap analysis will provide governments with road map to equip the institutions and provided much needed employment to the growing youth population. In addition to TVET, there will be need for training for local businesses in structuring transactions and understanding the electricity sector. Currently, few have been able to benefit from international funding that allows them to participate in minigrid construction and operations.

Regulatory Fragmentation

While legal frameworks exist, enforcement is weak due to overlapping mandates and limited institutional capacity. Delays in PPAs, licensing, and tariff reform erode investor confidence. A lack of real-time monitoring further hampers regulatory accountability (Chirambo, 2017; Elabbas et al., 2023). All the country compacts have indicated the need to strengthen mini-grid regulations to give confidence to private sector investors. In Rwanda, lessons from the EnDev program highlight how collaboration with the government led to the development of Simplified Licensing Guidelines and a tariff methodology for isolated mini-grids (Muchunku and Heinemann, 2022). This ensured that mini-grid tariffs were aligned with national standards while avoiding pricing conflicts with the main grid. High import duties and VAT all contribute to the affordability gap (Phillips et al, 2020; Fillol et al, 2022). The development of enterprises from imports, installation and maintenance of solar home systems and mini-grids will result in corporate taxes that could off set any government revenue losses. Tanzania has also indicated willingness to pilot a PPP transmission line. Asset recycling could be another structure that could release funding to governments that could then be used to finance further infrastructure. This will need strong independent regulators and robust wheeling tariffs (Fillol et al, 2022). All

compacts have indicated the need for strong electricity regulators. All the compacts have indicated the need regional power pools and building of regional interconnectors. Some like Zambia and Tanzania have indicated their ambition to be power trading hubs and have open access regimes. Unfortunately none of the countries have explicitly indicated the need Independent System Operator or Regional System operators to manage the trade of electricity. This will require a high degree of regional coordination.

Underdeveloped Financial Ecosystems

Most compacts target high private-sector contributions, but domestic capital markets remain shallow. Local banks lack long-term lending tools and risk guarantees, pushing developers toward costly foreign capital. National funds and blended finance instruments remain largely untapped (Wang et al., 2022; Barnard & Nakhooda, 2014). Based on analysis, 8 of the 12 Mission 300 country compacts explicitly mention using Results-Based Financing (RBF) to catalyze renewable energy access initiatives. Nigeria references RBF under its Nigeria Electrification Project (NEP) and Distributed Access through Renewable Energy Scale-up (DARES) program to incentivize mini-grid and solar home system deployment. Madagascar employs RBF through the DECIM platform to bridge viability gaps for hybrid mini-grids in off-grid communities. Niger plans to scale RBF instruments for mini-grids, standalone solar systems, and clean cooking technologies.

Results-Based Financing (RBF) has emerged as a transformative tool for scaling distributed renewable energy (DRE) across Africa, linking financial incentives to verified electrification outcomes (Stritzke et al, 2021). While this model has catalyzed private-sector investment in off-grid solar, mini-grids, and clean cooking technologies, its long-term viability hinges on addressing structural challenges and embedding sustainability mechanisms beyond donor funding cycles. Senegal and Côte d'Ivoire in this study—as well as Kenya (under KOSAP) and Rwanda—mitigated foreign exchange risk by denominating financial incentives in local currency, thereby avoiding currency mismatch challenges common in donor-backed programs (Das and Jeuland, 2020). The ability to include local banking institution in these programmes will not only build capacity in evaluating risk associated with distributed renewable energy projects but will guarantee the longevity of this business sector for local investors.

In general access to finance is pre-condition to providing affordable high quality products and services.

4.1 Opportunities for Reform & Coordination

Mitigating these structural risks in the Mission 300 Compacts calls for an integrated, multi-layered reform solution. Although all countries have started with promising plans, there are various common opportunities to enhance implementation, coordinate development activity, and mobilize funds at scale.

Create Compact-Wide Donor Coordination Platforms

Regional or thematic platforms can minimize duplication, standardize reporting frameworks, and synchronize development partner timetables with national energy plans. Such platforms would be modeled after joint working groups created under Power Africa and SEforALL with particular attention to Mission 300 implementation monitoring and cross-border infrastructure.

Embed Workforce Development in Compact KPIs

All compacts should include measurable workforce development targets tied to energy project deployment. Governments can align these targets with vocational institutions, local content regulations, and technical training hubs to build a pipeline of engineers, technicians, and regulatory specialists.

Streamline Regulations and Digitalize

Governments can accelerate reforms by implementing single window platforms for approvals and licensing, standardizing mini-grid frameworks and PPAs, and investments in real-time performance tracking through digital regulatory monitoring systems.

Tap Regional Financial Institutions and Sovereign Guarantees

Countries need to deepen their partnerships with national development banks, sovereign wealth funds, as well as with regional infrastructure facilities such as Africa50. Increased use of partial risk guarantees, along with pooled procurement, can reduce costs of financing for flagship projects.

Promote Scalable, Locally Based Clean Cooking Solutions

Governments must institutionalize clean cooking by way of special public agencies or task forces, mainstream LPG, ethanol, and upgraded biomass approaches in national energy plans, and tie goals for clean cooking to climate finance mechanisms under Nationally Determined Contributions (NDCs).

5.0 Conclusion

Mission 300 Energy Compacts are an important step towards organized, goal-oriented energy access planning in Africa. Though they are informed by lessons from previous initiatives, most of those same systemic obstacles—weak institutional capacity, regulatory fragmentation, as well as limited local financing—are still present in compact countries.

This paper calls for integrated reforms in workforce development, donor coordination, and regulation simplification to bring out the full promise of such commitments. The compacts need to transition from being policy frameworks to operational platforms with the capacity to scale up inclusive, durable energy solutions.

Their success will not be based on funding alone but also upon the quality of institutions to implement and adapt. Long-term progress will depend upon ambition being matched by capacity, with commitment translated into measurable access results.

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