Navigating Non-Technical Barriers To Affordable Electricity in Somalia

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Executive Summary

This study examines the non-technical and structural barriers that constrain access to affordable and reliable electricity in Somalia, focusing on Mogadishu's private energy market, which is dominated by the Banadir Electricity Company (BECO), Blue Sky Energy, and Mogadishu Power Supply (MPS). Drawing on mixed-methods data—including household and business surveys, interviews with electricity providers, and comparative African case studies—the research identifies governance weaknesses, security issues, regulatory gaps, heavy dependence on imported diesel, informal payment and tax burdens, and fragmented market structures as central impediments to energy reform.

Empirical findings reveal that Somalia's electricity tariffs are among the highest in the world, averaging $0.81 per kWh, primarily due to its reliance on small-scale diesel imports, which prevent economies of scale. Despite the national average tariff of $0.81 per kWh, Mogadishu enjoys the lowest rate at $0.36, reflecting its larger population base and more substantial economic capacity. Survey data indicate that 56% of households allocate an excessive share of their income to electricity, often at the expense of essential expenditures on food, education, and healthcare. Businesses, especially those reliant on cold storage, frequently face power outages, product spoilage, and direct financial losses. Seventy—one % report regular interruptions, and 54% experience spoilage-related losses.

Electricity companies acknowledge that while solar power offers a promising supplementary source, battery storage remains a costly and short-term solution, requiring frequent replacement and skilled maintenance. Wind energy potential is limited in Mogadishu (average 6 m/s, below the commercial threshold of 8 m/s), though strong wind resources exist in northern regions such as Mudug, Bari, and Sanaag. Despite opportunities, land disputes and security challenges continue to impede renewable projects.

At the institutional level, Somalia's Ministry of Energy suffers from leadership turnover and weak oversight, having had more than ten ministers since 2012. The absence of unified transmission systems results in duplication—often three separate poles, transformers, and cables on the same street—raising operational costs and inefficiencies. The World Bank has urged consolidation among private firms and improved regulatory governance as prerequisites for investment and sectoral reform. The findings emphasize that Somalia's electricity crisis is not solely technical but deeply political and institutional. Overcoming diesel dependence, weak regulation, and fragmented management requires establishing an independent technocratic energy authority, enforcing national wiring standards, and prioritizing renewable and LNG investments. LNG could reduce tariffs to $0.10 per kWh, transforming affordability and industrial competitiveness.

The study concludes that sustainable progress will depend on policy stability, coordinated donor engagement, and conflict-sensitive planning. Affordable, reliable, and sustainable electricity in Somalia demands an integrated strategy combining short-term relief (tax reduction, lifeline tariffs) with long-term reforms (renewable expansion, institutional strengthening, and public–private coordination). Without addressing these non-technical barriers, technical investments risk reproducing inefficiencies and perpetuating energy inequality across the Somali regions. This study contributes to understanding how non-technical barriers—such as governance deficits, regulatory gaps, and market fragmentation—shape electricity affordability in fragile states. It provides empirical evidence from Somali households and businesses, highlights lessons from other African countries, and offers policy-relevant insights for achieving affordable, reliable, and sustainable energy in Somalia.

Introduction

Electricity is the backbone of modern economies and a fundamental driver of human development, industrialization, and technological progress. Access to affordable, reliable, and sustainable electricity not only enhances productivity and business competitiveness but also improves social welfare through better healthcare, education, and living standards. For developing countries—particularly those emerging from conflict—energy access serves as both a developmental necessity and a test of state capacity. In fragile contexts such as Somalia, however, electricity provision remains one of the least developed and most expensive public services in the world. The sector is characterized by fragmented systems, limited regulation, heavy dependence on imported diesel, and high tariffs that place a disproportionate burden on households and businesses.

Over three decades of state collapse have left Somalia without a centralized national electricity grid. Instead, energy provision has been driven by the private sector, which filled the vacuum left by defunct public institutions. In Mogadishu, three major private companies, Banadir Electricity Company (BECO), Blue Sky Energy, and Mogadishu Power Supply (MPS) dominate the market. Among these, BECO supplies nearly 85% of the capital's electricity, while Blue Sky and MPS cover specific districts. This privatized structure has been both a source of resilience and inefficiency: while private entrepreneurship restored access in the absence of government capacity, it also led to uncoordinated expansion, duplicated infrastructure, and high operational costs. In some areas of Mogadishu, three separate sets of poles, transformers, and cables serve the same neighborhood, each owned by a different provider. Such inefficiencies inflate costs and hinder efforts to achieve economies of scale.

Nationally, electricity tariffs in Somalia remain among the highest in the world, averaging $0.81 per kilowatt-hour (kWh)—a figure far above the Sub-Saharan African average. Yet regional disparities are pronounced. While tariffs reach $1.00 in Galmudug, Hirshabelle, and Puntland, Mogadishu enjoys the lowest average rate at $0.36 per kWh, largely due to its dense population, concentration of businesses, and stronger purchasing power. This price differential highlights both the economic significance of Mogadishu and the deep inequalities that persist among Somalia's Federal Member States. High electricity costs have far-reaching consequences. Household surveys reveal that over half of Somali families spend an excessive share of their income on electricity, forcing them to reduce essential spending on food, healthcare, and education. Businesses—especially those requiring cold storage, such as pharmacies, restaurants, and grocery outlets—face operational risks, product spoilage, and reduced profitability, constraining their ability to expand or remain competitive.

Somalia's electricity sector remains overwhelmingly dependent on imported diesel fuel, which accounts for more than 80% of total generation. BECO alone consumes roughly 1,300 barrels of diesel per day, amounting to about $70 million annually. Diesel imports are typically purchased in small quantities, limiting the benefits of bulk economies of scale and exposing providers to volatile international fuel prices. The outbreak of the Russia–Ukraine war in 2022, for instance, triggered a surge in global fuel prices, which forced BECO to raise its tariff from $0.36 to $0.41 per kWh. In addition, the quality of imported diesel is often poor, lacking antioxidants and stabilizers, which leads to faster equipment degradation, reduced generation efficiency, higher emissions, and health risks due to air pollution. This persistent dependence on fossil fuels represents not only an economic burden but also an environmental and public health challenge.

The Somali government, through its National Transformation Plan (NTP, 2025), has articulated a vision to expand electricity access, diversify the energy mix, and reduce diesel dependency. The plan aims to increase national access from 61.9% to 80% by 2029, primarily through investments in renewable energy, institutional reform, and cross-border power trade within the Eastern Africa Power Pool (EAPP). However, despite these ambitions, significant obstacles remain. Frequent political turnover—more than ten Ministers of Energy since 2012—has eroded institutional memory and continuity, weakening the government's ability to implement long-term strategies. Regulatory gaps, rent-seeking practices by local officials, and security-related disruptions continue to undermine investment and project execution. For instance, BECO's proposed 25 MW solar project has been stalled for more than two years due to land disputes and interference by non-state actors.

Somalia's renewable energy potential is considerable but underutilized. The country receives over 3,100 hours of sunshine annually, and Mogadishu alone enjoys an average of six hours of solar radiation per day. This makes solar power an attractive alternative to diesel-based generation. Yet energy providers, including BECO and Blue-Sky Energy, emphasize that battery storage remains a costly and short-lived solution, with frequent maintenance and replacement requirements undermining its sustainability. Wind energy potential varies across regions: while Mogadishu's average wind speed of 6 meters per second falls below the commercial threshold, the northern regions—such as Galgadud, Mudug, Bari, and Sanaag—experience strong, consistent winds that could support utility-scale wind farms if adequate investment and technical expertise were available. Similarly, Somalia's estimated 200 billion cubic feet of natural gas reserves and proximity to regional LNG supply chains offer a promising medium-term path toward affordable power generation. A feasibility study indicates that developing an LNG terminal and dedicated power plant could reduce production costs to as low as $0.10 per kWh, enabling transformative economic and industrial growth.

Beyond technical constraints, non-technical barriers are the most formidable challenges to Somalia's energy transition. These include governance deficits, regulatory uncertainty, weak institutional capacity, limited financial resources, land conflicts, insecurity, and social inequities. Field interviews with Blue Sky Energy reveal pervasive bureaucratic hurdles: even with municipal approval, companies must often pay informal fees to local officials—such as police officers and district commissioners—before being allowed to install poles or dig trenches for cables. These unofficial payments inflate costs, delay projects, and discourage private investment. Furthermore, the absence of national standards for wiring, safety, and installation contributes to frequent electrical fires and fatalities, especially in unplanned urban settlements and internally displaced persons (IDP) camps. Electricity theft and meter tampering are common in such areas, resulting in significant non-technical losses and reduced revenue collection efficiency (estimated at around 85%).

In this complex environment, the role of international actors—especially the World Bank—is becoming increasingly critical. The Bank has committed over $100 million toward energy sector reform in Somalia, focusing on renewable energy, grid integration, and institutional strengthening. However, it has conditioned future support on better coordination and potential consolidation of private electricity providers to reduce inefficiency. On many Mogadishu streets, three sets of power lines and transformers, each belonging to a different company, illustrate the waste caused by market fragmentation. The World Bank argues that a unified or coordinated system would significantly cut operational costs, improve service reliability, and attract large-scale investment. Nevertheless, such consolidation has been slow due to political sensitivity, commercial rivalries, and the lack of a strong regulatory framework capable of mediating among private actors.

The research underpinning this study is motivated by the recognition that Somalia's electricity challenges are not merely technical but fundamentally institutional and political. While new technologies—such as solar mini-grids, battery storage, and LNG systems—offer promising solutions, their effectiveness depends on the broader governance environment. Without regulatory clarity, transparent pricing, and conflict-sensitive land management, infrastructure projects risk failure or unsustainability. This study, therefore, adopts a multidimensional approach, combining quantitative surveys of households and businesses with qualitative interviews and comparative analysis of other African experiences. It seeks to identify the non-technical barriers shaping electricity affordability and access in Somalia, while drawing lessons from countries such as Kenya, Nigeria, Liberia, Sierra Leone, and South Africa, which have confronted similar constraints in their energy transitions.

The study contributes to both academic and policy debates in three key ways. First, it provides empirical evidence of how high tariffs and unreliable supply affect Somali households and businesses, linking energy insecurity to broader issues of poverty, health, and economic stagnation. Second, it situates Somalia's experience within a comparative African context, highlighting the role of governance, regulation, and institutional reform in achieving affordable energy. Third, it offers policy-oriented insights tailored to Somalia's unique conditions—emphasizing the need for governance stability, donor coordination, community participation, and private-sector partnerships to achieve a sustainable energy future.

Ultimately, this research posits that achieving universal, affordable, and reliable electricity in Somalia requires more than technological innovation—it demands institutional transformation, policy continuity, and political commitment. The interplay between governance, economics, and technology defines the trajectory of Somalia's energy future. Addressing these non-technical barriers will not only lower electricity costs but also strengthen social welfare, stimulate private investment, and enhance the legitimacy of the Somali state.

Literature Review

Affordable and reliable electricity is widely recognized as a foundation for economic development and social welfare in Africa. Nevertheless, in fragile and conflict-affected states, the obstacles are not primarily technical but institutional, political, financial, and social. Literature on the African energy sector highlights how weak governance, regulatory gaps, political instability, insecurity, land disputes, and limited access to finance undermine electrification efforts. This section reviews empirical and policy evidence from African states to extract lessons that can inform strategies for overcoming non-technical barriers in fragile contexts, such as Somalia.

1 Governance and Institutional Barriers

A major theme in the African electricity literature is that governance failures are a decisive barrier to sectoral reform. Eberhard and Godinho (2017) argue that in Sub-Saharan Africa, the success of power reforms hinges less on technical design and more on political economy conditions, including leadership stability, policy consistency, and credible institutions. Studies of Nigeria's electricity reforms reveal how corruption, regulatory capture, and weak contract enforcement have hindered progress (Imam et al., 2018). Similarly, in post-conflict Liberia and Sierra Leone, reforms stalled when leadership changes disrupted institutional memory and donor-backed projects (World Bank, 2021). These experiences underscore the importance of technocratic capacity, adequate anti-corruption safeguards, and institutional stability.

Security and Land Disputes

Fragile states frequently face significant security challenges that hinder infrastructure development. In the Democratic Republic of Congo (DRC), renewable projects have been delayed or abandoned due to rebel activity and contested land rights (AP News, 2025). Similar issues were observed in South Sudan, where violent conflict discouraged private investment and raised project costs (IGC, 2021). Land rights disputes also complicate project siting: in Kenya, grid expansion projects have faced prolonged litigation over compensation and land expropriation (World Bank, 2016). These cases show that addressing security and land governance through community participation and conflict-sensitive planning is essential for project sustainability.

Regulatory Gaps and Tariff Structures

Poor regulation and inequitable tariff systems are another common non-technical barrier. Tanzania's experience with power-sector reforms demonstrates how weak regulation and poorly designed tariff systems led to unsustainable subsidies, revenue shortfalls, and investor uncertainty (Eberhard et al., 2017). In Nigeria, bulk consumers often receive preferential tariffs, while poorer households face higher effective rates, reducing equity (Shittu, 2024). Kenya, despite relative progress, still struggles with frequent tariff reviews and disputes between the regulator and private utilities (World Bank, 2022). These cases highlight the importance of independent regulatory authorities, transparent tariff-setting processes, and effective consumer protection mechanisms.

Financing Constraints and Market Structure

Underdeveloped financial markets and weak investment frameworks also constrain electricity affordability in Africa. Studies on Independent Power Producers (IPPs) across Sub-Saharan Africa indicate that when governments fail to provide guarantees or enforceable contracts, private capital is reluctant to invest (Eberhard & Gratwick, 2015). Nigeria's privatization of its generation companies (GENCOs) was undermined by insufficient financing and policy uncertainty (Adenikinju, 2019). In contrast, South Africa's Renewable Energy Independent Power Producer Procurement Programme (REIPPPP) demonstrates how transparent procurement and government guarantees can successfully attract private capital (World Bank, 2016). These comparisons illustrate the centrality of PPPs and blended finance in fragile energy markets.

Decentralized Solutions and Community Ownership

Many African countries have turned to decentralized renewable energy as a faster and more resilient solution for rural electrification. In Nigeria and Mali, mini-grids have shown success when designed with community participation and transparent governance structures (CES-ET, 2024). In Sierra Leone, donor-backed mini-grids supported by community management improved resilience and reduced vandalism (Hirmer, 2021). Studies emphasize that when communities feel a sense of ownership — through shared governance, local employment, or revenue sharing — the risk of theft, sabotage, and project failure decreases (Ngoti et al., 2024). Decentralization, therefore, represents not only a technical but also an institutional solution.

Social Dimensions of Energy Access

Electricity affordability is deeply linked to household welfare. Evidence from Kenya, Uganda, and Nigeria suggests that high electricity costs often compel households to reduce their spending on essential items, such as food and healthcare (Pachauri & Spreng, 2012). In many African countries, households often revert to using charcoal and firewood due to high electricity tariffs, which contribute to indoor air pollution and health risks (World Bank, 2021). Targeted subsidies, lifeline tariffs, and prepaid metering have been introduced in countries such as Ghana and South Africa to mitigate these risks. However, their effectiveness varies depending on governance capacity (Shittu, 2024). The broader lesson is that social protection policies must accompany energy reforms to ensure equitable outcomes.

Donor Coordination and Sequencing of Reforms

Donor agencies play a central role in fragile African states, but uncoordinated interventions can undermine sectoral progress. In Liberia and Sierra Leone, pooled donor funding tied to measurable governance reforms provided a model of coordinated engagement (World Bank, 2021). Conversely, in countries such as Chad and South Sudan, fragmented donor projects lacking institutional strengthening have failed to achieve sustainable outcomes (IEA, 2019). The literature suggests that sequencing is critical: governance and capacity-building reforms should precede or accompany technical investments to avoid waste and ensure sustainability.

Ethiopia's Hydropower and Its Potential Impact on Somalia's Energy Sector

Ethiopia's development of large-scale hydropower projects, notably the Grand Ethiopian Renaissance Dam (GERD) and other hydroelectric stations along the Blue Nile and other river systems, aims to generate a surplus of electricity for both domestic consumption and export to neighboring countries. Somalia has been identified as a potential recipient of Ethiopian electricity exports as part of regional energy integration efforts under the Eastern Africa Power Pool (EAPP).

While importing electricity from Ethiopia could help address Somalia's chronic energy shortages, reduce generation costs, and stabilize electricity prices, it also raises several economic, political, and strategic concerns. Relying heavily on imported electricity would reduce the autonomy of Somalia's domestic energy market. It could negatively affect the growth and profitability of local electricity companies, particularly those currently engaged in diesel-based power generation and small-scale renewable initiatives. Such dependence could discourage private sector investment in Somalia's own generation capacity.

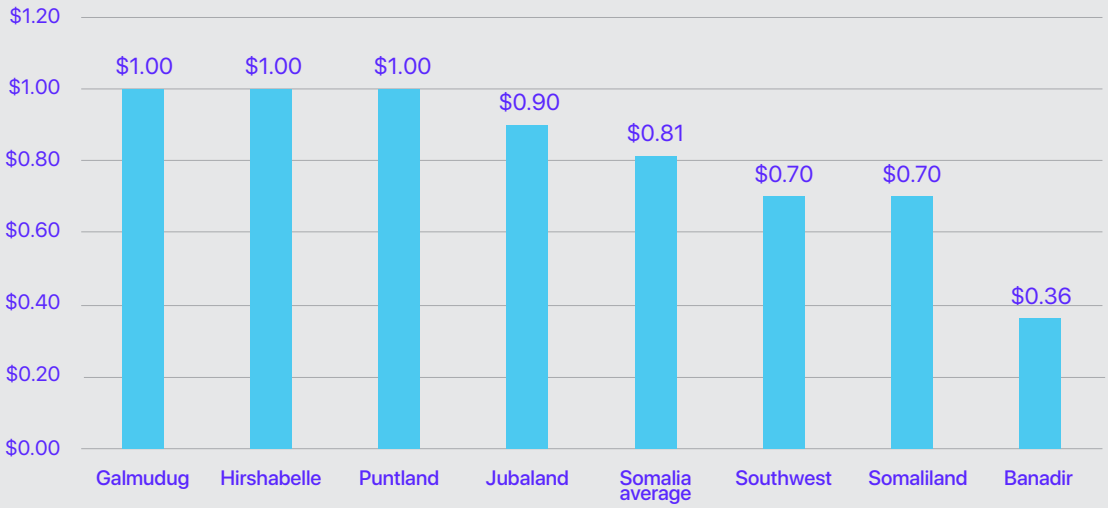
Another critical concern is the risk of supply disruption. Ethiopia retains full control over its hydropower infrastructure and transmission network, meaning that any political tension or diplomatic dispute between the two countries could result in a deliberate or accidental cutoff of electricity supply. Historical relations between Somalia and Ethiopia have been strained due to territorial disputes and ethnic tensions, particularly concerning Somali-inhabited regions within Ethiopia. These unresolved political and historical issues introduce an element of vulnerability into any potential energy partnership.

Moreover, both countries face internal political challenges and uncertainties in governance. In the event of political instability or armed conflict in either country, the reliability of cross-border electricity supply could be severely compromised. Therefore, while regional power trade can provide short-term relief and economic benefits, it should be approached with caution. Somalia's long-term energy strategy should prioritize the development of domestic renewable resources, including solar, wind, and hybrid systems, to ensure energy independence, sustainability, and resilience against geopolitical risks.

Somalia's Energy Sector: Insights from the NTP 2025

The National Transformation Plan (NTP) outlines Somalia's current energy challenges and strategic interventions aimed at fostering sustainable growth, inclusivity, and resilience. According to the NTP report, the energy costs in Somalia are among the highest globally, averaging USD 0.61–0.90 per kWh, primarily due to the country's heavy reliance on imported diesel for electricity generation. As a result, households and small businesses face prohibitive tariffs, which constrain access to affordable energy and limit economic competitiveness.

Figure 1 Electricity Tariff, 2023 (USD per kWh)



Source: Shuraako Pioneering Progress & NTP 2025

Despite the NTP report, in 2023, electricity tariffs across Somalia showed significant regional disparities. The cost per kilowatt-hour (kWh) was highest in Galmudug, Hirshabelle, and Puntland, each averaging $1.00, followed closely by Jubaland at $0.90. The national average tariff was $0.81 per kWh, reflecting the country's overall high electricity cost. In contrast, Southwest State and Somaliland reported considerably lower tariffs of $0.70, while the Banadir region (Mogadishu) had the lowest electricity cost at $0.36 per kWh. This substantial variation highlights the uneven energy pricing landscape across the Federal Member States, influenced by differences in generation sources, private sector efficiency, and infrastructural investment levels.

1 Current Landscape

Somalia's energy infrastructure is underdeveloped, inefficient, and fragmented. Diesel-fired generators dominate the energy mix, accounting for 88% of electricity generation, while solar contributes only 11%. Transmission and distribution (T&D) losses reach 40%, which is four times the African average, due to outdated infrastructure and weak monitoring systems. Consequently, Somalia's electricity generation capacity (0.4 kWh in 2022) remains one of the lowest in the region, resulting in per capita consumption far below that of neighboring Ethiopia and Kenya.

Energy access reveals deep-seated inequities: 80.1% of urban residents have access to electricity, compared to just 39.4% in rural areas. Although nearly half of Somalia's population lives within 10 km of existing energy infrastructure, the combination of low effective demand, affordability challenges, and high investment risks discourages private sector participation in rural electrification.

Security and Land Disputes

NTP aims to increase electricity access from 61.9% to 80% of the population by 2029 through diversification of the energy mix and rural electrification. Key initiatives include:

Renewable Energy Expansion: Investments in solar and wind to reduce diesel dependency, promote decentralized systems, and mitigate environmental impacts.

Institutional Strengthening: Establishment of the Somalia National Electricity Company (SONEC) and Somalia National Oil Company (SONOC) to unify providers, lower costs, and unlock hydrocarbon potential.

Infrastructure and Regulation: Development of a Power Purchase Agreement (PPA) framework, T&D asset mapping, and cross-border trade through the Eastern Africa Power Pool (EAPP).

Natural Gas Utilization: The Afgooye Natural Gas Project to support affordable energy and fertilizer production for food security.

Opportunities and Expected Impacts

Somalia possesses vast renewable resources, including 3,100 hours of sunshine annually, wind speeds of 8 meters per second (8 m/s), and 200 billion cubic feet of proven natural gas reserves. Harnessing these assets could reduce tariffs, attract private investments, and create jobs. By 2029, energy sector reforms and projects are projected to attract USD 5.3 billion in private investments, generate nearly 15,000 jobs, and contribute USD 1.45 billion to GDP.

Nevertheless, BECO carried out feasibility studies on three corners of Mogadishu and found that Mogadishu's annual average wind speed is 6 m/s—below the commercial threshold of 8 m/s (meters per second). In addition to that, energy service providers (ESPs) believe that the National Transformation Plan (NTP) is unlikely to succeed, viewing it as a repetition of the National Development Plan (NDP-9), which also failed to deliver meaningful results. Frequent ministerial changes, combined with weak institutional capacity, undermine effective implementation. Sustainable progress requires policy stability, institutional memory, and technocratic leadership rather than reliance on short-term political management.

Research Methodology

This study adopted a mixed-methods research design, combining quantitative and qualitative approaches to capture the multidimensional nature of Somalia's electricity sector. The methodology was designed to ensure both empirical rigor and contextual relevance, drawing on primary and secondary sources of data.

4.1 Research Design

The research employed an exploratory and explanatory design. The exploratory component examined household and business experiences with electricity affordability and reliability. In contrast, the explanatory component investigated the underlying non-technical barriers—such as governance, regulation, and financing—shaping these outcomes.

4.2 Data Collection Methods

A) Household Survey

A structured questionnaire was administered to households in Mogadishu to assess access, affordability, reliability, and coping mechanisms related to electricity use. The survey captured data on:

- Electricity expenditures as a share of household income.
- Frequency and stability of electricity supply.
- Coping strategies such as reducing consumption, reverting to solid fuels, or cutting essential expenditures (e.g., food, healthcare, education).
- Perceptions of health, welfare, and quality-of-life impacts associated with electricity access.

B) Business Survey

Questionnaires were also distributed to businesses, with a focus on two categories:

- Businesses requiring cold storage (e.g., pharmacies, restaurants, grocery outlets, and perishable goods vendors).
- Businesses not requiring cold storage (e.g., retail shops, services, and small-scale enterprises).

The survey assessed electricity costs, reliability, tariff perceptions, and the operational impacts of energy challenges. Respondents were further asked to provide recommendations for sectoral reform.

C) Key Informant Interviews (KIIs)

Semi-structured interviews were conducted with energy providers in Mogadishu, particularly representatives of the Banadir Electricity Company (BECO) and Blue-Sky Energy. These interviews examined sectoral dynamics, pricing structures, investment priorities, renewable energy prospects, and non-technical barriers, including land disputes, security issues, taxation, and governance challenges.

D) Document and Literature Review

Secondary data were collected through a systematic review of academic literature, policy documents, donor reports, and African case studies. Comparative insights were drawn from countries such as Nigeria, Liberia, Sierra Leone, Tanzania, Kenya, South Africa, and the Democratic Republic of Congo to contextualize Somalia's experiences within broader regional patterns.

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4.3 Sampling Strategy

Households: A purposive sampling method was used to capture diverse socioeconomic groups within Mogadishu, ensuring representation from both low-income and middle-income households.

Businesses: Stratified sampling was applied, distinguishing between cold storage and non-cold storage enterprises to allow comparative analysis of electricity impacts.

Key Informants: Providers were selected based on their role in electricity generation, distribution, and policymaking, with priority given to BECO due to its market dominance in Mogadishu.

4.4 Data Analysis

Quantitative Data: Survey responses were analyzed using descriptive statistics (percentages, frequencies, cross-tabulations) to identify patterns in electricity access, costs, and impacts.

Qualitative Data: Interviews and open-ended responses were thematically coded to identify recurrent themes related to governance, regulation, security, and financing.

Comparative Analysis: Findings from Somalia were triangulated with African case studies to identify similarities, divergences, and potential lessons for policy and practice.

4.3 Ethical Considerations

The study adhered to the highest ethical research standards, ensuring that informed consent was obtained from all respondents. Participation was voluntary, with confidentiality and anonymity guaranteed. Sensitive issues such as household income, business operations, and provider challenges were handled with discretion to protect respondents' privacy.

Electricity Sector in Mogadishu, Banadir Region

5.1 Introduction

Electricity is a cornerstone of economic growth, social welfare, and industrial transformation. In Somalia, decades of conflict and institutional collapse have resulted in the fragmentation of public infrastructure, including the energy sector. The absence of a centralized electricity grid has forced the private sector to fill the vacuum, resulting in a market characterized by innovation, competition, and informality.

Currently, Mogadishu's electricity sector is dominated by three private providers: Banadir Electric Company (BECO), Mogadishu Power Supply (MPS), and Blue-Sky Energy. Established in 2014, BECO emerged from the merger of over thirty smaller firms, positioning itself as the city's leading electricity provider, controlling approximately 85% of Mogadishu's power supply. MPS and Blue-Sky Energy serve smaller but significant portions of the city's districts.

While private entrepreneurship has restored essential services in a post-conflict environment, the sector remains plagued by high costs, heavy reliance on imported diesel, regulatory uncertainty, and limited state oversight. This study integrates insights from interviews with BECO and Blue-Sky Energy, providing a comprehensive overview of the structure, challenges, and potential pathways for reform in Mogadishu's electricity sector.

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5.2 Historical Background and Structural Evolution

The collapse of Somalia's central government in 1991 marked the disintegration of all national utilities, including the Somali Electric Agency (SEA). Following the aftermath, local entrepreneurs established small-scale, neighborhood-based electricity systems using diesel generators. By 2012, Mogadishu had an estimated 36 independent providers, operating informal micro-grids with limited capacity and no transmission coordination.

In 2014, efforts led by Somali business leaders resulted in the consolidation of multiple small providers into the Banadir Electric Company (BECO). The formation of BECO marked a turning point by introducing higher-voltage transmission, centralized generation facilities, and modern distribution networks. Generation plants were relocated approximately 26 kilometers outside Mogadishu, reducing urban noise and air pollution.

Despite BECO's dominance, MPS and Blue-Sky Energy continue to serve independent areas, reflecting both the entrepreneurial vitality and the fragmented character of the Somali energy market. This fragmentation contributes to duplication of infrastructure — often with three parallel electricity lines, poles, and transformers operating within the same neighborhood — which increases operational inefficiency and cost.

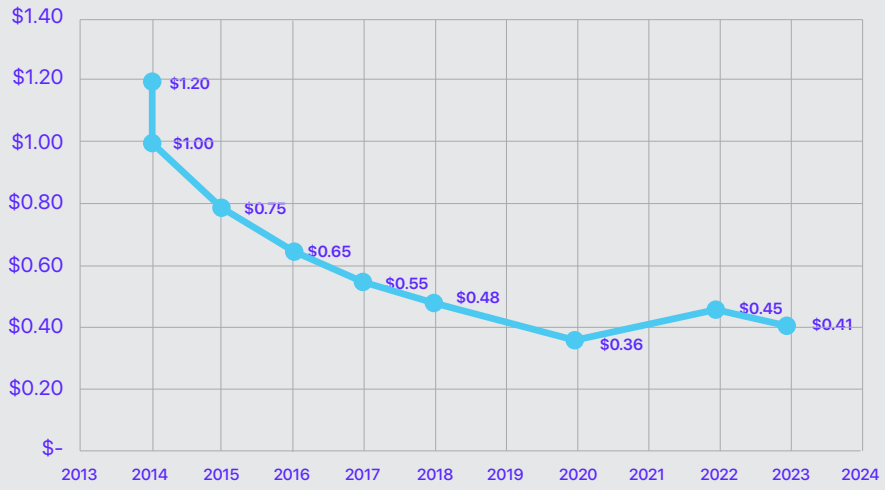
5.3 Energy Sources and Dependence on Diesel Fuel

The Somali energy landscape is overwhelmingly dependent on imported fossil fuels. Diesel accounts for approximately 82–85% of Mogadishu's electricity generation. For instance, BECO consumes approximately 1,300 barrels of diesel per day, at an estimated daily cost of $193,700 (or approximately $70 million annually). Diesel's high import costs, price volatility, and low quality create a persistent challenge. Diesel imports occur in small shipments, preventing economies of scale. Furthermore, the absence of quality control mechanisms allows for the use of substandard fuel, which lacks antioxidants and stabilizers, thereby accelerating engine wear, reducing efficiency, and contributing to air pollution and public health risks. This dependence exposes electricity providers and consumers to global price shocks. For instance, following the Russia–Ukraine conflict, BECO's electricity tariff increased from $0.36 to $0.41 per kWh, reflecting the direct impact of global fuel market volatility on domestic pricing.

5.4 Electricity Pricing Dynamics

The trajectory of electricity pricing reflects the sector's volatility. At its inception in 2014, the unit cost was $1.20 per kWh, which gradually declined through operational improvements and ultimately reached $0.36 per kWh by 2022. However, the Russia–Ukraine conflict triggered global fuel price shocks, forcing an upward adjustment to $0.41 per kWh.

Figure 2 BECO Electricity Tariff Dynamics (2014-2023)



Minimum for business $0.30, maximum for household $0.41.

Between 2014 and 2023, BECO consistently reduced electricity prices, reflecting its commitment to affordable and accessible energy. Prices fell from $1.00 per kWh in 2014 to $0.35 by 2020, the lowest in the company's history—before stabilizing at $0.46 in 2022 and $0.41 in 2023. These steady reductions significantly lowered household and business costs, expanded energy access, and demonstrated BECO's resilience in the face of global economic challenges.

5.4 Administrative, Regulatory, and Governance Constraints

Private electricity providers face extensive bureaucratic and informal barriers. To install poles, transformers, or underground cables, companies must secure municipal permits. However, even with official documentation, local officials, police officers, and soldiers often demand unofficial payments before granting access to public land. Such rent-seeking practices not only increase project costs but also delay expansion plans and undermine investor confidence.

Institutionally, Somalia's Ministry of Energy and Water Resources lacks the capacity and continuity to provide adequate oversight. Between 2012 and 2025, more than ten different Ministers of Energy have been appointed, leading to disrupted policy continuity and weak institutional memory. Ministries often lack technical archives, standardized procedures, or a stable technocratic workforce, which inhibits the formulation and enforcement of long-term energy policies.

This governance vacuum has resulted in the absence of national standards for electrical wiring, safety protocols, and infrastructure design. Consequently, unsafe household installations remain widespread, contributing to frequent electrical fires and fatal accidents. Energy companies report 15–20 deaths annually related to unsafe wiring before the implementation of safety reforms.

5.5 Economic and Technical Performance

BECO currently operates an installed capacity of 72 MW, allowing it to supply electricity at approximately $0.34 per kWh, the lowest rate in Somalia (compared to the national average of $0.81 per kWh). Meanwhile, Blue Sky Energy and MPS serve smaller customer bases, reporting collection efficiency rates of 80–85%, with the remaining losses attributed to technical inefficiencies, theft, and billing challenges.

Somalia's electricity companies are vertically integrated, performing generation, transmission, and distribution simultaneously. While this model was initially pragmatic in the absence of public coordination, it limits efficiency and accountability. In international practice, these functions are typically separated to promote specialization and reduce transmission losses. Transmission and distribution losses in Mogadishu are estimated at 15–20%, driven by low-quality materials, aging infrastructure, and illegal connections, particularly in informal settlements and internally displaced persons (IDP) camps, where inspection is difficult.

5.6 Renewable Energy and Future Technologies

BECO has initiated a 25 MW solar project, though implementation has been delayed for over two years due to clan-based land disputes and interference by non-state actors. Similarly, wind energy feasibility studies conducted by the BECO indicate that Mogadishu's average wind speed (6 m/s) is below the commercial threshold (8 m/s). Consequently, solar combined with battery storage remains the most viable pathway for renewable integration.

Electricity companies in Mogadishu recognize the substantial potential of renewable energy, particularly solar power, given the city's average of six hours of daily sunshine. Frequent battery degradation, high replacement expenses, and the lack of technical expertise to manage large-scale storage systems make this option unsustainable as a long-term solution for Mogadishu's electricity needs. Consequently, while solar energy offers a valuable supplementary source, it cannot yet provide the reliability or capacity required to meet the city's growing demand without significant advancements in storage efficiency and affordability.

Somalia possesses potential LNG reserves, and feasibility studies show that the smallest import vessel in the Indian Ocean can carry 30,000 metric tons, necessitating investment in both a terminal and dedicated power plant infrastructure. BECO has also explored Liquefied Natural Gas (LNG) as a medium-term solution. A feasibility study estimated that building an LNG terminal ($150 million) and power plant ($120 million) could reduce production costs to $0.10 per kWh, yielding transformative economic benefits through industrial expansion and job creation.

Globally, LNG represents a cost-effective energy source. If operationalized, LNG could reduce electricity costs in Mogadishu to $0.10 per kWh, representing a transformative reduction. The investment could be recouped within 2–3 years, generating broad macroeconomic benefits including industrial growth, job creation, and higher tax revenues. Energy providers have therefore argued for directing part of the $300 million World Bank allocation for Somalia's energy sector toward a centralized LNG terminal rather than dispersing funds among multiple providers.

5.7 Security, Land Use, and Socioeconomic Challenges

The energy sector operates in a highly volatile and fragile environment. Security threats, clan-based disputes, and informal taxation by both authorities and non-state groups disrupt infrastructure development. For example, public institutions frequently fail to pay electricity bills, adding fiscal stress to private companies.

Unplanned urbanization and population displacement have created congested neighborhoods with unregulated electrical connections. Electricity theft and meter tampering are prevalent in these areas, resulting in non-technical losses and safety hazards. These challenges are compounded by the limited technical capacity of local electricians and the weak enforcement of safety standards.

5.8 The Role of International Actors

The World Bank and other international partners have shown growing interest in supporting Somalia's energy sector. The Bank has committed $100 million for energy reform in Mogadishu (expected by 2028), with a focus on grid integration, institutional strengthening, and renewable energy expansion. However, the World Bank has urged that Mogadishu's electricity companies merge or coordinate operations to reduce infrastructure redundancy and operational inefficiency. As one interviewee noted, "on one street, you may find three separate poles, three transformers, and three cables—each belonging to a different company." Without government mediation, such duplication will persist, wasting both private and donor resources.

5.9 Governance and Public–Private Partnerships (PPPs)

The National Transformation Plan (NTP) and Public–Private Partnership (PPP) frameworks were designed to strengthen collaboration between the government and the private sector. However, electricity companies reported limited awareness and weak implementation of these initiatives. Frequent political changes and inadequate institutional follow-up have reduced private sector confidence. Sustainable progress will require policy stability, institutional capacity-building, and clear contractual frameworks to attract long-term investment while maintaining public accountability.

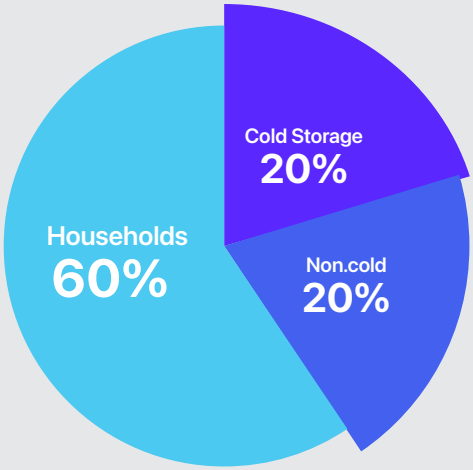
Data Analysis

This section analyzes the survey data collected from households and businesses in Mogadishu, with a particular focus on affordability, reliability, and the economic implications of electricity use. The household survey captures how families experience high tariffs, unstable supply, and the resulting trade-offs with essential expenditures. The business survey, meanwhile, distinguishes between two categories: enterprises requiring cold storage—such as pharmacies, restaurants, and grocery outlets—and those not reliant on cold storage, such as retail shops and small-scale service providers.

Comparative analysis highlights both shared and divergent experiences. While all businesses face high costs and unreliable supply, cold storage enterprises are disproportionately affected due to product spoilage, operational interruptions, and direct financial losses. In contrast, non-cold storage businesses experience reduced profitability, postponed expansion, or adjusted pricing strategies. By examining these differences, the survey results offer nuanced insights into how electricity challenges affect economic activity across sectors, underscoring the urgency of reforms to enhance affordability, reliability, and equity in Somalia's energy sector.

A total of 369 respondents participated in the survey. Among them, 150 were business entities, comprising 75 cold storage businesses and 75 non-cold storage businesses. In addition, 219 households were surveyed. Furthermore, five sectoral experts—representing public health, economics, and environmental disciplines—were also consulted to provide professional insights.

Figure 3 Survey Respondent Distribution



As the pie indicates, this distribution highlights that households formed the majority of respondents, followed by equal representation from cold and non-cold storage businesses.

6.1 Household

The household survey results revealed diverse experiences with electricity access and affordability, indicating both progress achieved and persistent challenges. A majority of respondents (63%) agreed or strongly agreed that their households had reliable access to electricity, while 21% disagreed and 16% remained neutral. Although access levels were generally high, stability was less assured: only 54% agreed that electricity supply in their area was stable with minimal outages, whereas 16% disagreed and nearly 29% were neutral. This suggests that while access has expanded, the quality and consistency of supply remain uneven. Similarly, when asked whether electricity was available for sufficient hours per day, 61% agreed or strongly agreed, 18% disagreed, and 20% were neutral, underscoring that time-based availability continues to present a limitation for a significant proportion of households. Affordability concerns emerged even more prominently. Over half of households (56%) agreed that electricity consumed an excessive share of their income, while 20% disagreed and 24% remained neutral. Price volatility was also widely acknowledged, with 69% reporting increases in electricity tariffs during the past year, while 15% disagreed. These rising costs directly constrained household welfare: 63% reported cutting back on essential expenditures such as food, health, or education because of high electricity bills, while only 13% disagreed. Furthermore, 67% admitted to reducing or limiting electricity consumption due to costs, highlighting the direct link between affordability challenges and restricted quality of life.

Charcoal and firewood remain the dominant sources of household cooking fuel in Somalia, accounting for over 80% of total energy consumption. When asked about reliance on solid fuels, 46% of households agreed or strongly agreed that they primarily relied on charcoal, firewood, or electricity for cooking, while 26% disagreed and 29% remained neutral. Cost considerations strongly influenced this behavior: 53% reported using charcoal or wood because electricity was too expensive, compared to 20% who disagreed.

The health implications of such reliance on solid fuels were also significant. Nearly two-thirds (64%) of respondents believed that using charcoal or wood negatively impacted household health, primarily due to smoke and indoor air pollution, while 11% disagreed and 25% were neutral. At the same time, there was considerable willingness to adopt cleaner alternatives: 61% stated they would switch away from charcoal or wood if affordable electricity or gas were available, compared to just 10% who disagreed and 30% who were neutral.

Electricity challenges extended beyond affordability and cooking fuel choices, influencing broader living conditions and health outcomes. More than half of the households (58%) reported that a lack of affordable electricity hindered their ability to safely store food, while 14% disagreed and 28% remained neutral. Similarly, 63% agreed that unreliable electricity posed a threat to the safe storage of medicines requiring refrigeration, such as vaccines and insulin, while 14% disagreed and 22% remained neutral. These findings underscore the public health risks associated with unaffordable and unstable energy access, particularly for vulnerable populations.

The household survey highlights that Somali families are burdened by both the high cost and unreliability of electricity. These challenges drive households to adopt coping strategies, such as reduced consumption, reliance on cheaper yet harmful fuels, or diverting resources from essential needs. At the same time, households expressed a willingness to transition to cleaner, safer energy sources if affordability and accessibility were improved, emphasizing the need for regulatory reform, governance improvements, and sustained infrastructure investment.

6.2 Businesses Requiring Cold Storage

According to the survey data, businesses requiring cold storage represented a diverse set of enterprises, including restaurants and cafés (29%), grocery and retail outlets (19%), drug stores and pharmacies (45%), and dairy, meat, and fruit vendors (7%). These were predominantly small-scale operations, with 60% employing fewer than five workers, 32% employing between six and twenty, and only 8% employing twenty-one to fifty employees. In terms of business maturity, 45% of respondents reported operating for less than two years, 35% between two and five years, 15% between six and ten years, and only 5% had been in business for more than a decade.

All respondents in this category confirmed that they had access to electricity (100%), though supply sources varied. A large majority (88%) reported relying on private diesel-based providers, while 7% indicated they used solar power and 5% operated their own generators. Costs were consistently high: 28% of businesses reported monthly bills below $100, 44% spent between $100 and $500, 23% between $501 and $1,000, and 5% incurred bills above $1,000. When expressed as a share of operating costs, 30% estimated electricity expenses at below 10% of total expenditures, 35% reported 10–20%, 20% indicated 21–40%, and 15% stated that electricity accounted for more than 40% of operating costs. These figures, according to customers' accounts, highlight the disproportionate financial burden electricity places on cold storage businesses.

Despite universal access, reliability was reported as a significant challenge. While all respondents had connections, 71% reported frequent outages that disrupted operations, and only 29% described their supply as stable. The consequences, according to the respondents, were serious: 54% cited product spoilage, 26% mentioned customer dissatisfaction, and 20% explicitly linked outages to financial losses. Affordability concerns were also evident, with 65% of businesses stating that tariffs were unreasonably high compared to revenues, whereas 35% considered them manageable. Furthermore, 72% believed the tariff system was unfair, citing irregular billing and insufficient consumer protection, while 28% considered it fair.

Respondents also offered explanations for high electricity costs: 80% attributed them to reliance on diesel-based generation, 15% to the absence of a national grid, and 5% to poor system maintenance. When asked about reforms, 60% recommended investing in renewable energy, 25% called for the development of a national grid, and 15% emphasized the need for stronger regulation. Overall, these findings—based on customer perceptions and feedback—underscore that electricity is not merely a cost factor but a critical operational requirement. For cold storage businesses in particular, failures in affordability, reliability, and governance translate directly into financial losses, product spoilage, and heightened risks to business survival.

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6.3 Businesses Not Requiring Cold Storage

According to the survey data, the second category consisted of businesses not directly dependent on cold storage. These included general retail shops, tailoring services, small-scale manufacturing workshops, internet cafés, and other service providers. Unlike their cold storage counterparts, these enterprises were generally smaller in scale and less capital-intensive, with 70% employing fewer than five workers, 22% using between six and twenty workers, and only 8% employing more than twenty staff. In terms of business maturity, 50% had been established for less than two years, 30% for two to five years, 15% for six to ten years, and 5% for more than a decade.

All respondents in this category reported having access to electricity (100%). However, as with cold-storage businesses, supply was dominated by private diesel-based providers (85%), with smaller shares using solar energy (10%) or self-owned generators (5%). Monthly expenditure on electricity was relatively lower compared to cold-storage businesses, but still significant. About 40% reported monthly bills below $100, 38% between $100 and $500, 17% between $501 and $1,000, and 5% above $1,000. When considered as a proportion of operational expenses, 45% estimated that electricity accounted for less than 10% of costs, 30% between 10% and 20%, 15% between 21% and 40%, and 10% indicated electricity expenses above 40%. These responses show that even businesses not reliant on refrigeration perceive electricity as a substantial operational cost.

Reliability challenges were also reported. According to respondents, 64% experienced frequent outages that interfered with normal business operations, while only 36% described their supply as stable. The consequences varied: 40% reported loss of customers due to service disruptions, 35% indicated reduced productivity, and 25% cited financial losses linked to outages. Regarding affordability, 58% of businesses stated that electricity tariffs were too high in relation to their revenues, while 42% considered them manageable. Furthermore, 68% of respondents argued that the tariff system was unfair due to irregular billing and lack of consumer protection, whereas 32% considered it fair.

When asked about the drivers of high electricity prices, 75% attributed costs to dependence on diesel fuel, 20% to the absence of a national grid, and 5% to poor maintenance. In terms of reform priorities, 55% recommended investing in renewable energy solutions, 30% advocated for developing a national grid, and 15% called for stronger regulatory oversight. According to the feedback, businesses that do not require cold storage may experience slightly less vulnerability than their cold-storage counterparts; however, they remain heavily burdened by electricity costs and the risk of outages. Respondents consistently highlighted that affordability and reliability are critical constraints, directly shaping their ability to sustain and expand operations.

6.3 Comparative Analysis: Cold Storage and Non-Cold Storage Businesses

The survey findings reveal both similarities and important distinctions between businesses that require cold storage and those that do not. General access to electricity was reported across both categories, with 100% of respondents in each group connected to a source of supply. However, in both cases, the vast majority relied on private diesel-based providers, underscoring the structural absence of a centralized grid system in Mogadishu. A smaller share of respondents in both groups reported supplementing their supply with solar energy or self-owned generators, reflecting limited diversification of energy sources.

In terms of electricity costs, cold-storage businesses were more heavily burdened. A larger proportion of them (43%) reported monthly bills exceeding $500, compared to only 22% of non-cold-storage businesses. When costs were measured as a share of total operating expenses, cold-storage enterprises were more likely to report electricity expenditures above 40% of total costs (15%) than their non-cold-storage counterparts (10%). This difference aligns with the nature of cold-storage operations, which require continuous refrigeration and stable power to maintain the integrity of perishable goods. According to respondents, the financial burden of electricity was consistently described as "disproportionate" by cold-storage operators, while non-cold-storage businesses generally considered costs high but comparatively more manageable.

Reliability was another area of divergence. While both categories reported frequent outages, the consequences differed in severity. For cold-storage businesses, 71% of respondents reported regular power interruptions, leading to product spoilage (54%), customer dissatisfaction (26%), and direct financial losses (20%). For non-cold-storage businesses, 64% also experienced frequent outages, but the main impacts reported were reduced productivity (35%) and loss of customers (40%). This demonstrates that although reliability is a cross-cutting issue, its effects are more immediately damaging to cold-storage enterprises, where even short interruptions can cause irreversible losses.

Regarding tariff perceptions, dissatisfaction was widespread, but more substantial among respondents in the cold-storage sector. Sixty-five percent of cold-storage operators stated that tariffs were unreasonably high in relation to their revenues, compared to 58% of non-cold-storage businesses. Furthermore, 72% of cold-storage businesses described the tariff system as unfair due to irregular billing and weak consumer protections, compared to 68% in the non-cold-storage group. Both categories, therefore, perceived systemic inequities in tariff administration, though the sense of burden was more acute among those with refrigeration needs.

When asked about the drivers of high electricity costs, both categories emphasized dependence on diesel fuel (80% of cold-storage and 75% of non-cold-storage businesses). Smaller shares in both groups indicated that the absence of a national grid and poor maintenance were contributing factors. On reform preferences, cold-storage businesses leaned slightly more toward renewable energy (60% compared to 55% for non-cold-storage), while non-cold-storage businesses placed a slightly greater emphasis on national grid development (30% compared to 25% for cold-storage). In both groups, around 15% highlighted the need for stronger regulation.

Overall, the comparative analysis shows that while both groups of businesses face high costs, unreliable supply, and weak regulatory protections, the intensity of the burden differs. Cold-storage enterprises bear a heavier cost load and suffer more severe consequences from outages due to the perishability of their products. Non-cold-storage businesses, while also strained, experience impacts that are disruptive but generally less catastrophic. Respondents across both categories consistently framed electricity not only as an operational input but as a critical determinant of survival and growth, with affordability and reliability standing out as the most pressing challenges.

Discussion

The findings of this study reveal that Somalia's electricity sector faces complex, multidimensional challenges that extend well beyond technical deficiencies. While the country's energy infrastructure remains underdeveloped and heavily reliant on imported diesel, the core impediments to affordable, reliable, and equitable electricity access are rooted in governance, regulatory, financial, and institutional weaknesses. The evidence from household and business surveys, combined with interviews from BECO and Blue-Sky Energy, reinforces that electricity provision in Somalia is not merely an engineering or market challenge, but a deeply political and structural issue tied to the broader state-building process.

7.1 Affordability and Socioeconomic Impacts

Affordability emerged as one of the most critical challenges across all levels of analysis. Survey data indicate that more than half of Somali households (56%) regard electricity costs as an excessive burden on their incomes. In comparison, 63% reported cutting back on essential expenses such as food, health, or education to pay electricity bills. Businesses faced similar struggles, with 65% of cold-storage enterprises and 58% of non-cold-storage companies reporting that tariffs were unreasonably high relative to their revenues. These findings align with global and regional literature, suggesting that in fragile states, energy affordability directly determines household welfare and business sustainability (Pachauri & Spreng, 2012; Shittu, 2024).

Mogadishu's electricity price—though the lowest nationally at $0.36 per kWh, compared to the national average of $0.81—remains unaffordable for many households and small enterprises. This relative affordability in the capital is primarily attributed to its large population density, stronger purchasing power, and the scale efficiencies achieved by BECO. Nonetheless, electricity expenditure continues to consume a disproportionate share of household income, particularly among low- and middle-income families. This economic burden has far-reaching implications for poverty alleviation, gender equality, and social welfare, as households divert funds from essential needs toward energy consumption.

7.2 Business Vulnerability and Economic Implications

Electricity reliability and cost are equally critical for business survival. The comparative analysis between cold-storage and non-cold-storage enterprises highlights significant disparities in exposure to energy risks. Cold-storage businesses—such as pharmacies, restaurants, and grocery outlets—reported higher electricity expenditures, more frequent outages, and more severe operational consequences. Over 70% of these firms experienced regular power interruptions, with more than half (54%) reporting product spoilage and direct financial losses. In contrast, non-cold-storage businesses primarily suffered from reduced productivity and customer dissatisfaction. These findings demonstrate that electricity insecurity directly undermines Mogadishu's urban economy, constraining business competitiveness, employment creation, and the expansion of small and medium enterprises (SMEs).

Such patterns mirror evidence from other African contexts, including Nigeria and Tanzania, where unreliable power and high tariffs have limited industrialization and private-sector growth (Eberhard & Gratwick, 2015). In Somalia's case, limited access to reliable electricity also restricts the potential for agro-processing, manufacturing, and cold-chain logistics—sectors essential for economic diversification and food security. Thus, improving affordability and reliability is not only a matter of social welfare but also a prerequisite for sustained economic transformation.

7.3 Governance and Institutional Weaknesses

Governance deficits and institutional instability emerged as the most pervasive non-technical barriers. Somalia's Ministry of Energy and Water Resources has undergone over ten leadership changes between 2012 and 2025, leading to policy discontinuity and weak institutional memory. The absence of standardized procedures, regulatory enforcement, and technical archives undermines both policymaking and investor confidence. This institutional fragility mirrors the experiences of other post-conflict states, such as Liberia and Sierra Leone, where frequent political turnover disrupted donor-backed energy reforms (World Bank, 2021).

Interviews with energy providers further revealed widespread rent-seeking practices that inflate project costs and discourage investment. To install poles, transformers, or underground cables, companies must secure municipal permits, yet they are often compelled to make unofficial payments to local officials, police officers, or district commissioners before work can proceed. These informal transactions not only delay project implementation but also contribute to systemic corruption, undermining efforts to professionalize the sector. Without governance reform and the establishment of a competent, technocratic regulatory authority, Somalia's energy market will remain vulnerable to inefficiency and exploitation.

7.4 Regulatory and Market Fragmentation

Somalia's electricity market operates in an uncoordinated, fragmented structure dominated by vertically integrated private providers that manage generation, transmission, and distribution independently. This arrangement, while practical during state absence, has become increasingly inefficient. On many Mogadishu streets, three separate sets of poles, transformers, and cables exist—each belonging to different companies. Such duplication raises infrastructure costs, limits coverage, and prevents economies of scale. The World Bank has advocated for merging or coordinating private firms to improve efficiency and attract donor funding, emphasizing that shared infrastructure could significantly reduce tariffs and enhance reliability. However, consolidation remains politically and commercially contentious in the absence of government leadership and a clear regulatory framework.

The lack of consumer protection mechanisms exacerbates inequity in tariff administration. Both household and business respondents reported irregular billing, opaque tariff setting, and limited recourse in cases of overcharging. These perceptions erode public trust and further isolate low-income consumers. Lessons from Kenya's Energy Regulatory Commission and South Africa's Renewable Energy Independent Power Producer Programme (REIPPPP) demonstrate that transparent regulation, consistent tariff review, and credible public oversight are essential to balancing investor incentives with consumer protection. Somalia's failure to establish such regulatory mechanisms continues to constrain sectoral reform and investment.

7.5 Energy Mix and Technological Constraints

The dominance of diesel-based generation—accounting for more than 80% of supply—makes Somalia's electricity system highly vulnerable to global fuel price fluctuations. Diesel imports are small-scale, inefficient, and often of poor quality, leading to high generation costs and environmental pollution. The 2022 Russia–Ukraine war exemplified this vulnerability, as global fuel price spikes forced BECO to raise tariffs despite previous cost reductions. These patterns underscore the importance of diversifying Somalia's energy mix toward renewable and low-carbon alternatives.

While solar energy presents significant potential due to the country's 3,100 hours of annual sunshine (NTP, 2025), practical challenges remain. Electricity providers, however, report a more conservative figure of approximately six hours of effective daily sunlight, amounting to about 2,190 hours per year in Mogadishu. Electricity companies view battery storage as a temporary, high-maintenance solution unsuitable for large-scale, long-term supply. Frequent battery degradation, high replacement costs, and limited technical capacity hinder operational sustainability. Similarly, wind energy in Mogadishu is commercially unviable (average 6 m/s), though strong potential exists in northern regions such as Bari and Sanaag. Realizing these opportunities requires major investment in infrastructure, technical expertise, and grid integration.

Liquefied Natural Gas (LNG) represents a promising medium-term solution. Feasibility studies indicate that developing an LNG terminal and dedicated power plant could reduce production costs to $0.10 per kWh, transforming energy affordability and industrial competitiveness. However, such investments, which are estimated at $270 million, require coordinated financing, public-private partnerships (PPPs), and transparent governance to avoid replicating past inefficiencies.

7.6 Security, Land, and Social Challenges

Security instability, clan-based land disputes, and informal taxation continue to obstruct energy infrastructure development. BECO's stalled 25 MW solar project illustrates how land ownership conflicts and interference by non-state actors impede renewable initiatives. These obstacles mirror challenges observed in the Democratic Republic of Congo and South Sudan, where insecurity and contested land rights have derailed energy projects (AP News, 2025). Somalia's energy future, therefore, depends not only on technical and financial inputs but also on conflict-sensitive planning and community engagement. Ensuring local participation and benefit-sharing in project design can enhance legitimacy, reduce sabotage, and strengthen social cohesion.

On the social front, households' reliance on charcoal and firewood due to high electricity costs perpetuates deforestation, indoor air pollution, and health risks. Nearly two-thirds (64%) of respondents reported adverse health effects from using solid fuels, while 61% expressed willingness to switch to cleaner sources if affordable electricity or gas were available. This finding underscores the interlinkages between energy, environment, and public health, emphasizing that energy reform must be integrated within broader social and environmental policy frameworks.

7.7 Comparative Lessons from Africa

Comparative analysis with other African states reinforces the argument that technical solutions alone cannot resolve structural energy challenges. Nigeria's privatization struggles, Tanzania's tariff inequities, and Liberia's post-conflict governance failures all demonstrate the primacy of institutional capacity in achieving sustainable electrification (Eberhard & Godinho, 2017; Imam et al., 2018). Conversely, Kenya and South Africa's experiences highlight how transparent procurement, independent regulation, and donor coordination can yield positive outcomes. Somalia can draw valuable lessons from these precedents by prioritizing governance stability, phased reforms, and capacity building before large-scale technical investments.

7.8 7.8 Pathways for Reform

The study's findings collectively suggest that Somalia's energy transformation requires an integrated strategy combining short-term affordability measures with long-term structural reforms. Immediate actions should include reducing fuel import taxes, expanding the use of heavy fuel oil (HFO) as a cheaper alternative to diesel, and piloting lifeline tariffs for vulnerable consumers. Over the medium term, the government should establish a technocratic energy authority, enforce national wiring and safety standards, and promote decentralized solar mini-grids with community participation. In the long term, investment in LNG infrastructure, regulatory harmonization, and regional power trade within the Eastern Africa Power Pool can pave the way toward a diversified, sustainable energy future.

In sum, the study confirms that Somalia's electricity crisis is as much a governance and institutional challenge as it is a technical one. High tariffs, unreliable supply, and regional disparities stem from systemic weaknesses in regulation, coordination, and investment rather than from technological limitations alone. Sustainable progress will depend on political stability, institutional reform, and credible public–private collaboration. If effectively managed, Somalia's vast solar potential, emerging LNG opportunities, and growing donor engagement can collectively transform the energy landscape—reducing costs, expanding access, and strengthening the foundations of economic development and state legitimacy.

Conclusion

This study has examined the structural, institutional, and economic dimensions of Somalia's electricity sector, revealing that the country's persistent energy challenges are fundamentally non-technical in nature. While the lack of infrastructure, high transmission losses, and reliance on imported diesel contribute to inefficiency, the deeper causes of unaffordable electricity lie in security issues, weak governance, fragmented regulation, and market disorganization. The empirical findings—drawn from household and business surveys, as well as interviews with major electricity providers demonstrate how these barriers translate directly into social and economic hardship.

At the household level, high tariffs consume a significant portion of income, forcing many families to cut expenditures on essential needs such as food, education, and healthcare. The average Somali household spends an unsustainable share of its budget on electricity, with over 60% reporting trade-offs between energy and basic welfare. The consequences are especially severe for urban low-income groups and internally displaced populations, who often resort to unsafe, polluting fuels such as charcoal and firewood. This reliance exacerbates deforestation, indoor air pollution, and health risks—revealing the multidimensional poverty implications of energy insecurity.

For businesses, particularly those reliant on cold storage, unreliable supply and volatile prices have direct operational and financial impacts. Over two-thirds of enterprises surveyed experienced frequent power outages, with 54% of cold-storage operators reporting product spoilage and financial losses. Such disruptions undermine productivity, discourage investment, and constrain Somalia's already fragile private sector. Without stable and affordable energy, industrialization and job creation—central to the country's development goals—will remain unattainable.

From a governance perspective, the Ministry of Energy's limited capacity, frequent ministerial turnover, and lack of regulatory enforcement have created an unstable policy environment. The absence of national standards for safety and wiring, widespread rent-seeking among local officials, and uncoordinated private sector operations reflect the institutional fragility of the energy sector. Market fragmentation—illustrated by multiple electricity companies operating overlapping networks in Mogadishu—leads to inefficiency, duplication, and wasted investment. These conditions discourage both domestic and foreign investors, perpetuating Somalia's dependence on donor funding and expensive diesel imports.

However, the study also identifies emerging opportunities that could transform Somalia's energy landscape. The country's abundant solar resources, potential wind corridors in northern regions, and proven natural gas reserves offer a basis for diversification. BECO's feasibility study for an LNG (liquefied natural gas) terminal and power plant demonstrates a practical approach to reducing production costs to $0.10 per kWh, significantly lower than current rates. Furthermore, growing international support, particularly from the World Bank and other development partners, provides momentum for reform, provided that institutional and regulatory preconditions are addressed.

Somalia's electricity problem cannot be solved solely through technology. It is a political and institutional challenge that requires governance reform, policy stability, and credible coordination between the state, private sector, and international partners. Technical interventions—such as solar farms, mini-grids, and LNG infrastructure—will only succeed if accompanied by robust institutions, transparent regulation, and conflict-sensitive implementation. Energy reform must therefore be understood as both an economic priority and a state-building process, central to Somalia's social stability and long-term development.

Policy Recommendations

This study adopted a mixed-methods research design, combining quantitative and qualitative approaches to capture the multidimensional nature of Somalia's electricity sector. The methodology was designed to ensure both empirical rigor and contextual relevance, drawing on primary and secondary sources of data.

1 Enhance Affordability and Reduce Fuel Dependence

- Reduce or remove diesel import taxes (currently about $142 per metric ton) to immediately ease electricity generation costs.
- Introduce lifeline tariffs for low-income households and small businesses to ensure equitable access to electricity.

2 Diversify the Energy Mix through Renewables and LNG

- Prioritize solar plus storage systems in urban and peri-urban areas where sunshine averages six hours daily.
- Develop a phased LNG program, starting with one import terminal and dedicated power plant, financed through public–private partnerships (PPPs).
- Support wind power exploration in high-potential regions such as Galgadud, Bari, and Sanaag, leveraging international investment and regional expertise.
- Provide tax exemptions on solar panels, batteries, and renewable components to lower entry costs for providers and consumers.

3 Strengthen Governance and Regulatory Institutions

- Establish an independent, technocratic energy authority to oversee regulation, tariff setting, and licensing, separate from political ministries.
- Standardize wiring and safety protocols nationwide to prevent electrical fires and accidents, particularly in informal settlements.
- Enforce transparency and anti-corruption measures by creating a unified permitting process for infrastructure installation to eliminate rent-seeking behavior.

4 Rationalize and Consolidate Market Structure

- Facilitate the gradual consolidation of private providers, particularly in Mogadishu, to eliminate redundant infrastructure and achieve economies
- Create a shared transmission company, either state-owned or jointly managed, to handle grid operations and ensure fair access to all producers.
- Implement metering reforms and digital billing systems to reduce non-technical losses and improve revenue collection efficiency.

5 Address Land, Security, and Social Barriers

- Institutionalize conflict-sensitive project planning, ensuring that energy infrastructure projects incorporate community consultation and benefit-sharing mechanisms.
- Secure renewable project sites through partnerships between local communities, security forces, and municipal authorities to reduce theft and sabotage.
- Develop public awareness campaigns on energy safety, conservation, and payment ethics to foster social responsibility and reduce illegal connections.

6 Support Business Resilience and Job Creation

- Subsidize electricity for critical sectors such as health facilities, cold-chain storage, and educational institutions to prevent service disruptions.
- Invest in vocational training for technicians in solar installation, battery management, and LNG operations to build local capacity.

7 Improve Donor Coordination and Sequencing of Reforms

- Adopt a pooled funding mechanism, modeled after Liberia and Sierra Leone's post-conflict recovery programs, to ensure donor alignment and accountability.
- Sequence reforms strategically: strengthen governance and regulatory capacity before large-scale technical investments.
- Promote regional energy cooperation within the Eastern Africa Power Pool (EAPP) while safeguarding Somalia's energy sovereignty and private-sector participation.

Somalia stands at a pivotal juncture in its energy development trajectory. The evidence from this study makes it clear that achieving affordable and sustainable electricity will require a comprehensive approach—balancing immediate relief with long-term reform. The solutions are not merely technological but systemic, requiring the alignment of governance, finance, and policy. If effectively implemented, the proposed measures—fuel tax reduction, LNG investment, renewable expansion, institutional reform, and donor coordination—could collectively transform Somalia's electricity sector from one of the most expensive in the world into a model of resilience and inclusivity. In doing so, the country would not only unlock its economic potential but also strengthen social welfare, environmental sustainability, and the legitimacy of its state institutions. In essence, energy reform in Somalia is both a development imperative and a state-building project—one that demands consistency, collaboration, and courage from policymakers, private actors, and the international community alike.

Recommended Further Research

While this study provides valuable insights into the non-technical barriers and institutional constraints shaping electricity affordability in Somalia, it also reveals several areas where deeper and more specialized research is needed. Future investigations should build on these findings to inform evidence-based policymaking and enhance understanding of the energy transition in fragile and post-conflict contexts.

1 Comparative Federal Member State (FMS) Energy Studies

Future research should extend beyond Mogadishu to include systematic comparative assessments across all Federal Member States (FMS) such as Puntland, Jubaland, Galmudug, Hirshabelle, Southwest State, and Somaliland. Each region has distinct governance arrangements, resource endowments, and tariff structures that shape electricity access differently. Regional-level studies would help identify context-specific challenges and highlight opportunities for tailored policy interventions, especially in rural electrification and decentralized energy systems.

1 Renewable Energy Economics and Technological Feasibility

While this study confirmed the technical viability of solar energy in Somalia, further research is needed to evaluate the economic and technical feasibility of hybrid systems combining solar, battery storage, LNG, and mini-grids. Rigorous cost–benefit analyses should assess the long-term sustainability of renewable technologies under Somalia's climatic, financial, and institutional conditions. This includes modeling battery life cycles, maintenance costs, and the potential role of micro-grids in off-grid rural communities.

4 Governance, Regulation, and Political Economy of Reform

Given the persistent governance and regulatory weaknesses identified, future research should employ a political economy approach to analyze how power relations, rent-seeking behaviors, and institutional turnover shape energy policy outcomes. Such studies could explore why previous reform frameworks—like the National Development Plan (NDP-9) and National Transformation Plan (NTP)—failed to achieve intended results. Understanding these political and administrative dynamics is crucial for designing more resilient governance models for the electricity

6 Financing Models and Private Sector Participation

Somalia's energy transition will require innovative financing solutions that balance profitability with affordability. Future research should explore public–private partnership (PPP) models, micro-finance mechanisms, and community energy cooperatives that could attract investment while maintaining consumer protection. Comparative studies with Kenya, Rwanda, and South Africa could provide practical lessons on regulatory incentives, risk-sharing frameworks, and donor alignment.

5 Environmental and Public Health Impacts

A significant research gap exists in assessing the environmental and health consequences of heavy diesel dependence and widespread use of charcoal and firewood. Empirical studies should quantify emissions, air quality impacts, and related health costs, especially in urban and peri-urban areas. Such data would strengthen the case for renewable energy adoption and inform national environmental policy.

7 Regional Energy Integration and Geopolitical Risks

Given Ethiopia's growing hydropower capacity and potential electricity exports through the Eastern Africa Power Pool (EAPP), further research should assess the economic, political, and security implications of importing electricity from neighboring countries. Scenario analyses could evaluate the trade-offs between short-term affordability and long-term energy sovereignty, examining how cross-border power trade might affect Somalia's domestic electricity market, investment climate, and national autonomy.

The future research should move beyond descriptive analysis toward quantitative modeling, spatial comparison, and interdisciplinary approaches that integrate economics, governance, technology, and social policy. By deepening empirical understanding and broadening analytical scope, such studies can provide the robust evidence base required to design effective, context-specific strategies for achieving affordable, reliable, and sustainable electricity in Somalia.

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