

Electricity Affordability and Economic Development in Somalia: An Empirical Assessment

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Abstract

This study examines the effects of electricity affordability on business performance and economic development in Somalia. Using a quantitative design, data were collected from 420 businesses across eight major cities and analysed through descriptive statistics. The findings show that electricity tariffs ranged from US\$0.41 to US\$1.00 per kWh across the selected Somali cities, with an average of US\$0.68 per kWh. Nearly half of the businesses considered electricity unaffordable, while 47.1% spent more than 20% of their operating expenses on electricity. High electricity costs reduced profitability, limited production, discouraged investment, and delayed business expansion. However, 94.8% of respondents believed that affordable electricity would improve business performance, and 77.6% were willing to invest in solar energy if affordable financing were available. The study concludes that improving electricity affordability through renewable energy investment, affordable financing, stronger regulation, and integrated electricity networks could promote business growth, employment, and economic development in Somalia.

Keywords: Electricity affordability; business performance; renewable energy; private-sector development; Somalia.

Introduction

Electricity is a fundamental driver of economic growth and social development. Reliable and affordable electricity enables businesses to operate efficiently, supports industrial production, improves healthcare and education services, and enhances overall living standards. As a critical production input, electricity influences productivity business competitiveness, investment, and employment, making it essential for sustainable economic development. Somalia's electricity sector has developed differently from many countries in the region. Following decades of limited public investment, private electricity companies have become the primary providers of electricity generation and distribution. While private sector investment has expanded electricity access in many urban areas, Somalia continues to face some of the highest electricity rates in Africa, creating a significant constraint on economic growth. High electricity costs increase business operating expenses, reduce the competitiveness of locally produced goods and services, discourage investment, and place financial pressure on households. Small and medium-sized enterprises (SMEs), which form a large share of Somalia's economy, are particularly affected because electricity represents a substantial portion of their

production costs. Essential services such as healthcare and education also face higher operating costs, which can reduce the affordability and quality of services provided to the public. Despite the growing importance of electricity affordability, there is limited evidence-based research examining the factors driving high electricity prices and their broader economic implications in Somalia. Existing discussions often focus on electricity tariffs without adequately assessing their effects on business performance, investment, and national economic development.

Literature Review

Electricity is widely recognized as a fundamental driver of economic growth and structural transformation because it serves as a critical input for productive activities across all sectors of the economy (Burke et al., 2018). Reliable and affordable electricity enables industries to increase production efficiency and supports technological innovation (Best & Burke, 2018), while also stimulating investment and enhancing the delivery of essential public services such as healthcare and education (Lee et al., 2020). As countries industrialize and adopt digital technologies, access to affordable electricity becomes increasingly important for improving productivity, raising living standards, and promoting sustainable economic development (Perez-Sebastian et al., 2020). Lower electricity costs can enhance firm competitiveness, investment, and expansion by reducing production expenses, whereas high tariffs can constrain profitability and business growth

(Abeberese, 2017; Rud, 2012; Sievert & Steinbuks, 2020). Empirical evidence consistently supports theoretical perspectives by demonstrating a strong relationship between electricity access, affordability, and economic performance. For example, electrification has been shown to improve firm productivity and accelerate local economic development (Lipscomb et al., 2013). Similarly, Lee et al. (2020) found that reliable electricity facilitates technological adoption and strengthens the overall business environment, thereby contributing to higher economic growth. Burke et al. (2018) further argue that affordable and reliable electricity creates conditions that encourage industrial development and private sector expansion, while Fowlie and Meeks (2021) emphasize that improved energy access enhances long-term economic efficiency and supports sustainable development, particularly in low-income countries.

Comparative Experiences of Electricity Sector Development in Africa

Across Africa, electricity sector reforms have followed different development paths depending on institutional capacity, resource endowments, and national energy policies (Zhang et al., 2008). Comparative studies show that countries adopting well-designed regulatory reforms alongside infrastructure investment have achieved greater improvements in electricity access and system performance than those relying solely on market liberalization (Besant-Jones, 2006). More recent evidence further suggests that successful electricity reforms require a balanced

combination of public investment, private sector participation, and effective governance to improve both electricity access and affordability (Mwangi et al., 2023). Kenya has successfully diversified its electricity generation through geothermal, hydropower, wind, and solar energy, improving both energy security and supply reliability (Spittler et al., 2021). Ethiopia has pursued a different strategy by investing heavily in large-scale hydropower generation to support industrialization and reduce electricity costs, while Rwanda has expanded electricity access through regulatory reforms and decentralized energy systems that combine grid and off-grid solutions (Mugisha et al., 2021; Bimenyimana et al., 2018). These comparative experiences suggest that affordable electricity is not determined by a single reform but rather by the interaction of long-term planning, investment in domestic energy resources, and effective sector governance (Zhang et al., 2008). Evidence from East Africa indicates that countries with diversified energy portfolios and coherent regulatory frameworks have generally achieved greater improvements in electricity affordability and access than countries with fragmented electricity markets (Spittler et al., 2021; Mwangi et al., 2023). Although Somalia's electricity sector differs substantially from those of Kenya, Ethiopia, and Rwanda, these experiences provide useful policy lessons for strengthening electricity affordability and supporting sustainable economic development.

Somalia's Electricity Sector

Somalia's electricity sector differs significantly from those of many neighbouring countries because electricity generation and distribution have evolved largely through private-sector initiatives following decades of conflict and limited public investment (Dursun et al., 2021). Unlike most African countries that operate interconnected national grids, electricity services in Somalia are predominantly provided by privately owned electricity service providers operating independently across different cities (Come Zebra et al., 2021). Although this market-driven approach has expanded electricity access in many urban centres and demonstrated considerable entrepreneurial resilience, the absence of an integrated national electricity system continues to present significant structural challenges. The electricity sector remains highly fragmented, with isolated electricity networks operating independently rather than through a unified national transmission grid (Come Zebra et al., 2021). Most electricity generation continues to depend on imported diesel fuel, making electricity providers highly vulnerable to fluctuations in international fuel prices and increasing generation costs (Dursun et al., 2021). Limited investment in renewable energy, relatively small-scale generation systems, infrastructure constraints, and the absence of integrated transmission networks further reduce operational efficiency and contribute to persistently high electricity tariffs across the country. As a consequence, electricity prices in Somalia remain

among the highest in Africa, imposing substantial costs on both businesses and households (Dursun et al., 2021). High electricity tariffs reduce disposable household income, increase business production costs, and weaken the competitiveness of Somali enterprises, particularly small and medium-sized businesses (Come Zebra et al., 2021). Recognizing these challenges, recent studies emphasize the importance of electricity market reforms, greater investment in renewable energy, stronger regulatory institutions, and long-term national electricity planning to improve affordability and support sustainable economic development in Somalia.

Research Methodology

Research Design

This study employed a quantitative method to examine the relationship between electricity affordability and economic development in Somalia. The quantitative component assessed how electricity costs affect business operations, productivity, investment, and employment. This approach provided a comprehensive understanding of both the measurable economic impacts and the contextual challenges within Somalia's electricity sector.

Study Area

The study was conducted across selected major urban centres in Somalia where private electricity providers operate and economic activities are concentrated. The study covered Mogadishu, Hargeisa, Garowe, Jowhar, Kismayo, Baidoa, Laascaanood, and Dhusamareb. These cities were

selected because they represent different electricity markets and tariff structures, enabling comparison of affordability and its economic implications across diverse geographical settings.

Target Population

The target population consisted of businesses that depend on electricity for their daily operations and key stakeholders involved in the electricity sector. Businesses included manufacturing firms, retail and wholesale traders, restaurants, hotels, workshops, hospitals, schools, universities, and small and medium-sized enterprises (SMEs).

Sampling Procedure and Sample Size

A stratified sampling technique was employed to ensure representation of different business sectors and locations. Businesses were selected from the participating cities based on their reliance on electricity and the nature of their economic activities. A target sample of approximately 300–500 businesses was considered sufficient to provide reliable evidence on the economic impact of electricity costs.

Data Collection Methods

Primary quantitative data were collected using a structured questionnaire administered to business owners or senior managers. The questionnaire gathered information on monthly electricity expenditure, the proportion of operating costs attributable to electricity, business profitability, investment decisions, employment, pricing strategies, production constraints, and perceptions of electricity affordability. Respondents were also asked how lower

electricity prices would influence business expansion, investment, and job creation.

Data Analysis

Quantitative survey data were analyzed using descriptive statistical techniques, including frequencies, percentages, means, and cross-tabulations, to examine patterns in electricity expenditure and business performance. Comparative analysis was undertaken to assess differences across business sectors and geographical locations.

Findings

Demographic Profile of Respondents

A total of 420 businesses participated in the survey across eight major cities in Somalia. The respondents represented a broad range of business sectors that depend on electricity for their daily operations, providing a diverse perspective on electricity affordability and its economic implications.

The largest proportion of respondents were from Mogadishu (31.2%), reflecting its position as Somalia's largest commercial and economic centre. This was followed by Hargeisa (17.4%), Garowe (11.0%), Kismayo (10.5%), Baidoa (9.3%), Jowhar (8.1%), Dhusamareb (6.7%), and Laascaanood (5.8%).

The geographical distribution ensured representation from different electricity markets and enabled comparisons across major urban centres. Retail businesses constituted the largest share of respondents (30%), followed by

wholesale businesses (8.2%) and restaurants and cafés (17.6%). Manufacturing firms represented 6.2%, while hotels, healthcare facilities, educational institutions, financial services, ICT businesses, workshops, agriculture, and other service providers were also represented.

Main Source of Electricity

The majority of businesses (72.6%) relied on private electricity providers as their primary source of electricity. Around 11.9% depended mainly on diesel generators, while 8.3% used solar energy systems. Businesses using hybrid solar-diesel systems accounted for 5.0%, whereas only a small proportion relied on shared community generators or other sources.

Use of Multiple Electricity Sources

The findings show that 73% of surveyed businesses used more than one electricity source to maintain continuity of operations. Given the presence of multiple private electricity providers in some Somali cities, businesses often maintain connections with two or more providers so that they can switch supply when one provider experiences an interruption. This practice creates additional costs for businesses, as maintaining multiple electricity connections may involve fixed monthly charges regardless of actual electricity consumption. Businesses may also incur further costs from maintaining backup systems such as generators, batteries, and solar power. The findings therefore indicate that unreliable electricity supply generates costs beyond the electricity actually consumed, increasing the overall energy burden on businesses.

Electricity Price

Businesses reported paying electricity rates ranging from \$0.41 to \$1.0 per kilowatt-hour, with an average tariff of US\$0.68 per kWh. Businesses operating in smaller cities generally reported paying higher charges than those in larger urban centres.

The average cost remains considerably higher than electricity prices in many neighbouring countries, increasing production costs and reducing business competitiveness.

Daily Electricity Supply

Most respondents (67.6%) indicated that they received electricity for 24 hours per day, while approximately one-third experienced shorter periods of electricity availability.

Although electricity is generally available throughout the day, uninterrupted supply remains a challenge for many businesses.

Electricity Supply Reliability; Only 14.3% of respondents stated that they never experienced electricity interruptions. The majority reported occasional outages, while approximately one-quarter experienced frequent interruptions.

These findings suggest that although electricity availability has improved, service reliability remains inconsistent across locations.

Among businesses experiencing outages, 42.8% reported interruptions lasting between 30 minutes and one hour, while nearly one-quarter experienced outages exceeding three hours.

Longer outages were more common among businesses operating outside the largest cities.

Only 28.6% of businesses rated electricity reliability as good or very good, while 36.9% considered reliability to be poor or very poor. Overall, respondents viewed electricity reliability as moderate, with significant room for improvement.

Electricity Expenditure and Affordability

Average Monthly Electricity Bill; Businesses reported considerable variation in monthly electricity expenditure depending on their size and type of operation. Monthly electricity bills ranged from US\$80 to over US\$6,000, with an average monthly expenditure of approximately US\$845. Manufacturing firms, hotels, healthcare facilities, and educational institutions generally reported the highest electricity bills, while retail shops and small service businesses recorded relatively lower expenditures.

The findings indicate that electricity represents a substantial operating expense for many businesses, particularly those with high energy demand. Percentage of Operating Expenses Spent on Electricity; Nearly half of the respondents (47.1%) reported that electricity accounted for more than 20% of their monthly operating expenses. Approximately one-quarter (25.0%) indicated that electricity consumed more than 30% of their total business costs.

The findings demonstrate that electricity constitutes a major production cost for many

Somali businesses, reducing profitability and limiting opportunities for expansion.

Perceived Affordability of Electricity

Only 18.6% of respondents considered electricity to be affordable or very affordable, whereas nearly half (48.8%) described electricity as unaffordable or very unaffordable.

Table 3.1 Perceived Electricity Affordability

Response	Frequency	%
Very unaffordable	96	22.9
Unaffordable	109	25.9
Moderately affordable	137	32.6
Affordable	63	15.0
Very affordable	15	3.6
Total	420	100.0

The results suggest that electricity affordability remains one of the most significant challenges facing the private sector in Somalia.

Expenditure on Backup Electricity

Nearly 60.0% of businesses reported spending additional money on backup electricity systems to maintain operations during power interruptions. The findings indicate that unreliable electricity supply increases business operating costs beyond the monthly electricity tariff. Businesses using backup electricity reported spending between US\$50 and US\$2,500 per month, with an average monthly backup electricity cost of approximately US\$285. Fuel purchases for diesel generators accounted for the largest share of these expenses, particularly among manufacturing firms, hotels, and healthcare facilities. This additional expenditure further increases the overall cost of

doing business and reduces financial resources available for investment and employment.

Electricity-Related Costs Affecting Businesses

The majority of respondents (46.2%) identified the high electricity tariff as the single greatest electricity-related cost affecting their businesses. Fuel for generators ranked second (22.6%), followed by damage caused by power interruptions (13.1%).

Overall, the findings demonstrate that electricity imposes a substantial financial burden on businesses in Somalia. High electricity tariffs, increasing monthly electricity bills, and additional expenditure on backup power systems significantly raise operating costs. Nearly half of the surveyed businesses considered electricity to be unaffordable, while many allocated more than one-fifth of their operating expenses to electricity alone. These findings suggest that improving electricity affordability would substantially reduce business costs, enhance competitiveness, and create a more favorable environment for investment and economic growth.

Impact of Electricity Costs on Business Performance

Respondents were asked to indicate their level of agreement with ten statements using a five-point Likert scale, where 1 = Strongly Disagree and 5 = Strongly Agree. Higher mean scores indicate stronger agreement that electricity affordability significantly influences business operations and performance.

Table 3.2 Impact of Electricity Costs on Business Performance

Statement	Mean	SD	Ag/Stgly Agree (%)
Electricity costs are a major operating expense for this business.	4.48	0.73	89.3
High electricity prices reduce the profitability of this business.	4.42	0.79	87.1
High electricity costs limit our ability to increase production or services.	4.18	0.88	80.7
Electricity costs have caused us to increase the prices of our products or services.	4.11	0.94	78.6
High electricity prices make it difficult to compete with imported products.	4.05	0.98	75.2
Electricity interruptions reduce employee productivity.	3.97	0.96	72.4
Electricity interruptions cause loss or damage to products and equipment.	3.84	1.02	68.3
Electricity costs have delayed or prevented business expansion.	4.09	0.91	77.4
High electricity costs discourage investment in new equipment or technology.	4.22	0.86	82.1
More affordable electricity would improve the performance of this business.	4.71	0.58	94.8

The findings show that electricity costs affect several areas of business performance. Respondents reported that high electricity costs are a major operating expense (89.3%), reduce profitability (87.1%), discourage investment in

equipment and technology (82.1%), limit production or services (80.7%), increase product and service prices (78.6%), delay business expansion (77.4%), and reduce competitiveness against imported products (75.2%).

Electricity interruptions also affect operations, with 72.4% reporting reduced employee productivity and 68.3% reporting loss or damage to products and equipment. Importantly, 94.8% agreed that more affordable electricity would improve business performance, highlighting the potential benefits of lower electricity costs for productivity, investment, competitiveness, and business growth.

Reduction in Production or Service Hours

More than half of businesses (55.2%) reported reducing production or service hours due to high electricity costs, while 44.8% reported no reduction. Similarly, 39.8% of businesses reduced employee working hours because of electricity costs or interruptions, compared with 60.2% that did not. These findings show that high electricity costs affect business operations, working time, and overall productivity.

Impact on Investment and Business Expansion

High electricity costs have significantly affected business investment and expansion. A majority of respondents (61.7%) reported delaying the purchase of new machinery, equipment, or technology, while 38.3% had not. Similarly, 53.6% postponed opening new branches or expanding operations, compared with 38.1% who had not and 8.3% for whom expansion was not applicable.

These findings indicate that high electricity costs constrain capital investment, technological improvement, and long-term business expansion.

Reduction in Employment

Approximately 28.6% of businesses indicated that they had reduced the number of employees because of rising operating costs, including electricity expenses.

Table 3.3 Reduction in Number of Employees

Response	Frequency	Percentage
Yes	120	28.6
No	300	71.4
Total	420	100.0

Although electricity costs have not resulted in workforce reductions for most businesses, nearly one-third reported employment losses associated with increasing operating expenses.

Expected Business Response if Electricity Prices Declined by 25%

Respondents were asked to identify up to three actions they would most likely take if electricity prices were reduced by 25%. The most frequently selected responses were increasing production (72.4%), purchasing new equipment (58.6%), and improving product or service quality (54.8%). Nearly half also indicated that they would hire additional employees.

Table 3.4 Expected Business Responses to a 25% Reduction in Electricity Prices

Expected Action*	Frequency	Percentage (%)
Increase production	304	72.4
Purchase new equipment	246	58.6
Improve product or service quality	230	54.8
Hire more employees	205	48.8
Reduce prices of products or services	184	43.8
Increase savings or profits	173	41.2
Increase employee working hours	128	30.5
Open another branch	105	25.0
No major change	20	4.8
Other	8	1.9

*Multiple responses were allowed; therefore, percentages do not total 100%.

The findings suggest that lower electricity prices would stimulate investment, production, employment, and business competitiveness.

Potential Employment Creation

If electricity became significantly more affordable, 42.9% of businesses indicated that they could hire 1–2 additional employees, 18.1% could hire 3–5, 10.7% could hire 6–10, and 5.2% could hire more than 10 employees. In contrast, 15.2% reported that they would not hire additional employees, while 7.9% were uncertain.

Overall, 76.9% of businesses indicated potential for additional employment, suggesting that more affordable electricity could contribute to job creation and business growth in Somalia.

Current Use of Solar Energy

Approximately 28.3% of businesses reported currently using solar energy, while the majority (71.7%) continued to rely solely on conventional electricity sources.

Although solar energy adoption has increased in recent years, most businesses have not yet invested in renewable energy technologies.

However, barriers to Solar Energy Adoption Among businesses not using solar energy, the high initial installation cost (46.5%) was identified as the primary obstacle. Other important barriers included limited access to finance (24.6%), maintenance concerns (10.6%), and lack of technical information (8.6%). Percentages are based on businesses that do not currently use solar energy.

The findings suggest that financial constraints, rather than lack of interest, remain the principal barrier to wider adoption of renewable energy technologies.

Competition in the Electricity Market

Businesses strongly believed that greater competition among electricity providers would contribute to lower electricity prices ($M = 4.37$), with 87.6% agreeing or strongly agreeing. Respondents perceived increased competition as a means of improving efficiency, encouraging innovation, and reducing electricity costs.

Government Regulation

Respondents also expressed strong support for enhanced government regulation of the electricity sector. Approximately 89.5% agreed that stronger regulation would improve tariff transparency ($M = 4.42$).

Given Somalia's emerging electricity regulatory framework, this finding points particularly to the

need to strengthen implementation, enforcement, tariff oversight, licensing, institutional capacity, and transparency, rather than simply establishing new regulatory structures.

This finding reflects the expectation that an effective regulatory framework could strengthen consumer protection, improve market accountability, and promote fair pricing practices.

Recommended Actions to Improve Electricity Affordability

Thematic analysis of respondents' recommendations identified several recurring policy priorities.

Table 3.5 Recommended Policy Actions

Recommendation	Percentage of Responses
Increase renewable energy investment	36.4
Establish an interconnected national electricity grid	24.8
Strengthen electricity regulation and tariff oversight	18.3
Improve electricity infrastructure	12.6
Promote competition among providers	7.9

Businesses strongly supported expanding solar and other renewable energy investments, developing an interconnected national electricity network, strengthening regulatory oversight, and improving electricity infrastructure. Many respondents also emphasized the importance of creating a more competitive electricity market to encourage efficiency and reduce electricity prices. Overall, the findings demonstrate broad consensus among businesses regarding the reforms needed to improve electricity affordability in Somalia. Respondents emphasized

renewable energy development, national electricity grid integration, affordable financing, and stronger regulatory oversight as the highest policy priorities. They also stressed that meaningful improvements will require coordinated action by government, electricity providers, regulators, private investors, and development partners. These priorities align closely with the study's broader findings that reducing electricity costs is essential for improving business competitiveness, encouraging investment, creating employment, and supporting long-term economic growth.

Leadership in Improving Electricity Affordability

Respondents were asked who should take the leading role in improving electricity affordability in Somalia. More than 61% indicated that the government should take the lead, while 32% supported a joint public-private partnership (PPP) approach. Only 7% favored private-sector leadership alone. The finding indicates strong support for government-led reform, complemented by public-private collaboration.

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