Powering Progress: Addressing Energy Access and Clean Energy Transition in Kenya

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Introduction

Kenya is a country in Eastern Africa that borders the Indian Ocean and five countries: Ethiopia, Somalia, South Sudan, Tanzania, and Uganda. It is a relatively large country, spanning around 360,623 square miles, which is approximately five times the size of Ohio, for reference. The climate varies from tropical along the coastline to arid in the interior.[1] The terrain is comprised of low plains that rise to central highlands bisected by the Great Rift Valley, a system of geographical depressions that are geologically active and span from the Middle East in the north to Mozambique in the south.[2] It has access to a variety of natural resources such as gemstones, salt, and hydropower and are known for their abundance of wildlife.[3]

Kenya has a population of just over 58 million people, a median age of 21, and is the 38th fastest-growing country globally, with a 2.06% annual growth rate. Most of the population is heavily concentrated in the west along the shore of Lake Victoria as well as the capital of Nairobi, with a population of 5.3 million, and the city of Mombasa in the southeast along the Indian Ocean coast, with a population of 1.4 million.[4] Kenya's Human Development Index (HDI) value for 2023 was 0.628, which puts the country in the Medium human development category and positions it at 143 out of 193 countries and territories. Between 1990 and 2023, Kenya's HDI value increased from 0.485 to 0.628, a change of 29.5 percent. Another indicator of overall life improvement is that during that same time, Kenya's life expectancy at birth increased by 5.3 years.[5]

The history of Kenya dates to the late 1800s. The British Empire established the East Africa Protectorate in 1895, which became known as the Kenya Colony from 1920 onward. It gained its independence from the United Kingdom in 1963 and became a republic in 1964. Despite struggles with a single-party system in the late 1900s, today Kenya is a presidential republic with an executive, legislative, and judicial branch, like the United States. Their current president is William Ruto, who formerly served in parliament and has been in office since September 2022.

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[1] "The World Factbook: Kenya." Central Intelligence Agency, June 27, 2025. https://www.cia.gov/the-world-factbook/countries/kenya/.
[2] "Rift Valley." National Geographic. Accessed July 9, 2025. https://education.nationalgeographic.org/resource/rift-valley/.
[3] "The World Factbook: Kenya." Central Intelligence Agency.
[4] Ibid.
[5] "Human Development Reports: Kenya." United Nations Development Programme, May 6, 2025. https://hdr.undp.org/data-center/specific-country-data#/countries/KEN.

Their legal system is comprised of a mixed system of English common law, Islamic law, and customary law, whereby the Supreme Court reviews the laws.[6]

Kenya is the third-largest economy in Sub-Saharan Africa after Nigeria and South Africa, and it's considered one of the most dynamic and diversified economies in the region. The country has seen strong GDP growth, averaging between 5 and 7 percent annually in recent years. The economy is services-led, with the services sector making up 55% of GDP, followed by agriculture at 22%, and industry at around 17%. Agriculture remains a key part of the economy but services like tourism, telecommunications, and finance are moving the country toward a more modern economy. Kenya has adopted reforms to improve business in recent years, including public-private partnerships, infrastructure investment, and digital innovation. However, the economy is still highly vulnerable to climate-related droughts, which frequently disrupt agricultural output and negatively impact the energy sector.[7]

Kenya has one of the most diverse and renewable-heavy energy profiles in Africa, with about 90% of its electricity coming from clean sources. They have made remarkable progress in expanding energy access, growing from 37% in 2013 to 79% in 2023.[8] They also aspire to reach universal energy access by 2030 and net-zero emissions by 2050. However, despite the prevalence of renewable energy and growth in energy access, Kenya still faces problems within its energy sector. Rural areas lag behind urban populations in accessible electricity, plans to expand existing grids are underfunded, institutions are growing in capability but remain hindered by unclear regulation and corruption, carbon emissions continue to increase alongside energy demand as the economy grows, and energy sources such as hydropower remain susceptible to climate shocks such as drought. Kenya must overcome these challenges to achieve a secure and inclusive clean energy transition as it continues to grow as a nation.

This paper aims to provide a comprehensive description of the current energy situation in Kenya, identify key challenges associated with energy within the country, and offer recommendations to address these challenges. It will first narrow the focus of the study to three major challenges the country currently faces. Secondly, the paper will examine the energy sector of the country before explaining the current political economy. It will then list existing policies surrounding the energy

[6] "The World Factbook: Kenya." Central Intelligence Agency.
[7] Ibid.
[8] "Kenya 2024." IEA, April 2025. https://www.iea.org/reports/kenya-2024/executive-summary.

sector and identify current priorities and gaps in these policies. Lastly, the paper will conclude with an analysis of the findings and recommendations for senior leadership.

Focus of Study

The focus of this study is on three interrelated challenges within Kenya. First, while Kenya has made remarkable strides in national electrification, there are still disparities between urban and rural populations. Urban areas have near-universal electricity access, but rural communities continue to lag, with access levels still below 65%. The high cost of grid extension to remote and less populated areas, combined with limited purchasing power among rural households, has slowed progress. As a result, millions still rely on inefficient and polluting fuels like firewood and charcoal, especially for cooking and heating. These traditional fuels pose serious environmental and public health risks and disproportionately affect women and children.[9] Expanding access to modern, reliable, and affordable energy in rural areas is thus central to Kenya's efforts to reduce poverty, promote gender equity, and enable inclusive development. This paper explores both on-grid and off-grid solutions, including mini-grids, solar home systems, and community-based electrification initiatives.

Second, Kenya must improve its institutional and regulatory framework to ensure the energy sector functions efficiently and attracts sustainable investment. Although Kenya has made progress with reforms such as the Energy Act of 2019 and the establishment of the Energy and Petroleum Regulatory Authority (EPRA), key governance gaps remain.[10] Regulatory uncertainty, unclear licensing procedures, and inconsistent enforcement continue to frustrate investors and undermine public trust. Corruption, weak interagency coordination, and limited technical capacity within energy institutions further compound these issues. As Keeley and Matsumoto highlight in their study on determinants of foreign direct investment (FDI), these barriers not only delay project implementation but also deter private sector participation, particularly in high-risk, capital-intensive clean energy initiatives.[11] Strengthening Kenya's institutions through regulatory reform, increased transparency, and improved stakeholder engagement is essential to building a more resilient and accountable energy sector.

[9] "Kenya 2024." IEA.
[10] "Energy Act 2019." Energy and Petroleum Regulatory Authority, March 14, 2019. https://www.epra.go.ke/energy-act-2019.
[11] Keeley, Alexander Ryota, and Ken'ichi Matsumoto. "Relative Significance of Determinants of Foreign Direct Investment in Wind and Solar Energy in Developing Countries – AHP Analysis." Energy Policy 123 (2018): 337-348.

Third, and perhaps most critically, Kenya's energy transition must be both climate-resilient and socially equitable. With nearly 90% of electricity generated from renewables, Kenya is widely viewed as a regional leader in clean energy. However, this leadership position is vulnerable to both environmental and political-economic risks. Hydropower, for instance, is sensitive to climate-induced droughts, while rising energy demand threatens to increase reliance on fossil fuels unless renewables are rapidly scaled with adequate grid integration and storage.[12] Furthermore, the expansion of clean energy infrastructure has not been without controversy. In the Great Rift Valley, geothermal projects such as those at Olkaria have faced land disputes, especially with Maasai communities, who allege displacement, inadequate compensation, and exclusion from decision-making processes.[13] These disputes not only delay development but also raise serious questions about fairness, consent, and justice in Kenya's energy transition. Ensuring that the shift to clean energy is climate-resilient and socially inclusive requires addressing these land governance challenges alongside technical upgrades such as battery storage, climate-proofed infrastructure, and enhanced data systems.

Collectively, these challenges capture the core tensions and opportunities shaping Kenya's energy future. By tackling rural energy poverty, institutional bottlenecks, and social and environmental risks in tandem, Kenya can solidify its position as a clean energy leader while ensuring that the benefits of development are widely shared.

Energy Sector

Energy Profile

To reiterate, Kenya's electricity generation mix is one of the cleanest in Sub-Saharan Africa, with about 90% coming from renewable sources. Geothermal leads the way at around 47%, followed by hydro at 21%, and wind and solar making up 19%. The power sector produces around 3.3 gigawatts (GW) of electricity. Broken down by source, it is led by geothermal at 0.95 GW, followed by hydropower at 0.8 GW, as well as wind and solar combined at almost 0.8 GW. The

[12] "Kenya 2024." IEA.
[13] Collins, Tom. "Kenya's Maasai Fear Mass Displacement from Geothermal Plant." African Business, March 11, 2021. https://african.business/2021/03/energy-resources/kenyas-maasai-fear-geothermal-plant-development.

remaining capacity is from oil, mostly in diesel generators.[14] While Kenya can use geothermal as a baseload, and hydropower to supplement the variation in production from wind and solar, a continued increase in this variable renewable energy introduces a potential need for energy storage systems to maximize the energy generated and improve grid stability.

However, while the power grid itself is green, a large share of Kenya's total energy supply still comes from traditional biofuels and waste, including firewood and charcoal, especially in rural areas for cooking and heating. Total energy supply includes all the energy produced in or imported to a country, minus that which is exported or stored. It represents all the energy required to supply end users in the country. Biofuels and waste make up 63% of the total consumption of energy in Kenya and are the source of 94% of residential energy consumption, being primarily used for space heating and cooking. [15] This dual reality highlights the gap between the formal electricity system and broader household energy use. Kenya also continues to import petroleum for transportation and backup generation, underscoring the need for a more comprehensive clean energy transition beyond the grid.

Energy Access and Gaps

Kenya has made significant strides in expanding electricity access, growing from just 37% in 2013 to nearly 79% in 2023.[16] The SDG7 Energy Progress Report 2025 listed Kenya as one of the fastest-electrifying countries with an annual growth rate of 4.4%.[17] However, while Kenya has been able to rapidly increase electrification, it has not been an equitable distribution. Urban electrification is now essentially universal while rural access still trails at around 65%.[18] To address the rural electricity access issue, Kenya launched The Last Mile Connectivity Project (LMCP) in 2015, which has since cut the number of people without access to electricity in rural areas by almost half, from 20 million to 11 million.[19] Additionally, Kenya has utilized off-grid solutions such as solar-powered mini-grids, which are used by one in five households.[20]

[14] "Kenya 2024." IEA.
[15] "Kenya 2024." IEA.
[16] Ibid.
[17] *Tracking SDG 7: The Energy Progress Report 2025.* Washington, DC: World Bank, 2025. https://trackingsdg7.esmap.org/sites/default/files/download-documents/sdg7-report2025-0620-v6-highres.pdf.
[18] "Kenya 2024." IEA.
[19] Ibid.
[20] Ibid.

In addition to rural electricity access, access to clean cooking is still a major issue in Kenya. While electrification rates rose significantly from 2013 to 2023, clean cooking access only increased from 10% to 31% at the same time. Nearly seven in ten households still rely on polluting fuels such as wood or charcoal. To combat this, Kenya launched the Kenya National Cooking Transition Strategy (KNCTS) in 2024, which provides a roadmap for universal access by 2028. However, fuel prices have elevated in recent years, which has led to a decrease in financial support and incentives for clean cooking solutions in households.[21] Overall, while Kenya has been able to improve electricity access, there are still gaps in rural access as well as access to clean cooking that the country needs to address.

Energy Resources and Technologies

Kenya possesses substantial renewable energy potential, with geothermal, hydro, wind, and solar resources forming the backbone of its electricity sector. Geothermal energy is the dominant source, enabled by the tectonic dynamics of the Great Rift Valley, and has grown by over 375% between 2010 and 2022.[22] The state-owned Kenya Electricity Generating Company (KenGen), in which the government holds a 74% stake, operates major geothermal plants such as Olkaria I, II, IV, and V, while Olkaria III is managed by the U.S.-based private firm Ormat Technologies.[23] However, these geothermal installations, particularly in Olkaria, are in areas with contested land ownership, where Indigenous Maasai communities have raised claims over displacement and exclusion from decision-making.[24]

In addition to geothermal, hydropower remains a significant contributor to the grid, especially the Seven Forks Hydro Stations on the Tana River, but is increasingly vulnerable to climate-induced droughts. The Lake Turkana Wind Power Project, the largest in Africa at 310 megawatts, supplies up to 17% of the grid but has also been mired in legal disputes over land rights and community consultation.[25] Solar power, especially in rural off-grid areas, has also expanded rapidly. Kenya accounted for nearly 74% of solar home system sales in East Africa in 2023 and is the largest market for such systems on the continent.[26] Despite these renewable advances,

[21] Ibid.
[22] "Kenya 2024." IEA.
[23] "Geothermal." KenGen, October 11, 2023. https://www.kengen.co.ke/index.php/business/power-generation/geothermal.html.
[24] Collins, "Kenya's Maasai Fear Mass Displacement."
[25] "Lake Turkana Project in Indigenous Territories, Kenya." Global Atlas of Environmental Justice, May 22, 2022. https://ejatlas.org/print/lake-turkana-project-in-indigenous-territories.
[26] "Kenya 2024." IEA.

Kenya still relies on imported petroleum and diesel, which constitute around 29% of total final energy consumption, mostly for transport and backup generation. [27]

Looking ahead, Kenya is attempting to modernize its energy system not only by improving grid reliability but also by investing in emerging technologies. These include a 100 MW utility-scale battery energy storage system (BESS) financed through a World Bank program, which is expected to mitigate renewable intermittency and enhance grid flexibility.[28] Kenya is also slowly trying to improve its electric mobility to counter the reliance on fossil fuels for transport. In early 2024, Kenya Power announced a three-year $1.9 million investment plan to accelerate the adoption of electric vehicles (EVs) in the country.[29] While the country continues to face challenges in distribution losses, energy access gaps, and fuel dependency, these initiatives reflect a strong national trajectory toward low carbon, decentralized, and technologically advanced energy systems.

Political Economy

To assess the political economy of Kenya, this paper will use the model established by Michaël Aklin et al. in *Escaping the Energy Poverty Trap*. According to Aklin et al., the political economy is shaped by the actions and interests of national governments, which are the primary actors capable of reducing energy poverty. The theory the authors propose is energy poverty is a political problem that relies on three building factors to be addressed within a country: government interest, institutional capacity, and local accountability.[30] Government interest refers to whether political leaders see tangible political benefits, such as economic growth, political stability, or electoral gains, from expanding energy access. Without these benefits, politicians are unlikely to prioritize energy poverty, especially in rural areas where the payoff may seem limited.[31] Institutional capacity is the government's ability to design, fund, and implement

[27] Ibid.
[28] "Kenya to Implement 100MW Battery Energy Storage System Project." International Trade Administration, December 19, 2023. https://www.trade.gov/market-intelligence/kenya-implement-100mw-battery-energy-storage-system-project.
[29] Nhede, Nicholas. "Kenya Power Unveils Electric Vehicles Market Expansion Plan." Energy Capital & Power, April 26, 2024. https://energycapitalpower.com/kenya-power-electric-vehicles-ev-plan/.
[30] Aklin, Michaël, Patrick Bayer, S. P. Harish, and Johannes Urpelainen. *Escaping the Energy Poverty Trap: When and How Governments Power the Lives of the Poor*. MIT Press, 2018.
[31] Aklin et al., *Escaping the Energy Poverty Trap*, 63-65.

effective energy access programs.[32] This depends on the presence of skilled bureaucracies, competent regulators, and functional ministries or utilities companies. Institutions must have both technical expertise and organizational strength to carry out electrification projects and ensure their long-term success. Local accountability refers to rural citizens' ability to voice their needs and hold politicians accountable if they neglect energy-poor communities.[33] It is often the decisive factor in whether energy access becomes a political priority or remains overlooked.

Government Interest

In Kenya, there is clear and sustained government interest in expanding energy access, demonstrated by a combination of national strategies, flagship programs, and international commitments. The *Kenya Vision 2030* development blueprint identifies energy as a key enabler of economic transformation, and successive governments have prioritized energy infrastructure as part of broader efforts to accelerate industrialization and reduce poverty.[34] Rural electrification has been a political priority as it boosts political support and demonstrates developmental progress. Programs such as the LMCP have connected millions of rural households to the grid and are often promoted in political campaigns and development speeches.[35] Kenya's leadership has also embraced clean energy as a tool for enhancing national energy security, reducing dependence on imported fossil fuels, and asserting international climate leadership. Recently, in April 2025, the government submitted its second nationally determined contribution, pledging a 35% reduction in emissions by 2035, an ambition that signals government interest that could potentially attract international investment.[36] Government interest in Kenya is also evident in major developments such as the Lake Turkana Wind Power Project and the expansion of geothermal capacity in the Olkaria region.[37] However, while government interest is essential, it must be accompanied by strong institutions and local accountability mechanisms to ensure that energy investments are both effective and equitable.

Institutional Capacity

[32] Aklin et al., *Escaping the Energy Poverty Trap*, 61-62.
[33] Aklin et al., *Escaping the Energy Poverty Trap*, 61.
[34] "About Vision 2030." Kenya Vision 2030. Accessed July 11, 2025. https://vision2030.go.ke/about-vision-2030/.
[35] "Kenya 2024." IEA.
[36] "Kenya's Second Nationally Determined Contribution (2031-2035)." United Nations Framework Convention on Climate Change, April 30, 2025. https://unfccc.int/sites/default/files/2025-05/KENYAS%20SECOND%20NATIONALLY%20DETERMINED%20CONTRIBUTION%202031_2035.pdf.
[37] "Kenya 2024." IEA.

In recent years, Kenya has improved a previously lagging institutional framework to support energy development, though capacity gaps remain. Under the 2019 Energy Act, the EPRA licenses projects, sets tariffs, and oversees compliance across electricity, petroleum, and renewables.[38] The Kenya Power & Lighting Company (KPLC) manages distribution and retail operations, the Kenya Electricity Generating Company (KenGen), leads generation, and the Kenya Electricity Transmission Company (KETRACO) handles the high-voltage grid.[39] These institutions made significant achievements and installed capacity grew from 1,800 MW in 2014 to over 3,300 MW in 2023, and grid-based access rose to approximately 84% nationally.[40] However, operational limitations persist. Coordination across agencies is fragmented, permitting can be bureaucratic and slow, and utilities continue to face aging infrastructure. As of 2024, Kenya experienced around 16% system loss of generated power due to aging transmission and distribution networks.[41] While Kenya's energy governance structure is robust on paper, weaknesses in interagency collaboration, regulatory execution, and resource management limit its full realization.

Additionally, corruption has been a persistent issue in Kenya's energy sector. On July 10, 2025, members of parliament scrutinized KPLC for financial irregularities such as a Ksh10.2 billion (~78.8 million USD) charge listed as "Network Management Expenses," as well as the LMCP which has underperformed in relation to the funding it has received.[42] Moreover, several high-profile energy projects have been associated with allegations of land grabbing and exclusion of local communities, especially indigenous Maasai groups near geothermal sites in the Rift Valley.[43] These cases highlight that while national leaders are highly motivated to expand access and showcase development progress, these efforts are sometimes undermined by corruption, patronage, and weak accountability.

Local Accountability

In Kenya's democratic system, local accountability mechanisms are present but inconsistently effective. On one hand, elected officials face real incentives to expand rural electrification, with

[38] "Energy Act 2019." Energy and Petroleum Regulatory Authority
[39] "Kenya Country Commercial Guide." International Trade Administration, July 5, 2024. https://www.trade.gov/country-commercial-guides/kenya-energy-electrical-power-systems.
[40] "Kenya Country Commercial Guide." International Trade Administration.
[41] Ibid.
[42] Juma, Mustafa. "MPs Grill KPLC Officials over Financial Irregularities, Stalled Projects." K24 Digital, July 10, 2025. https://k24.digital/411/mps-grill-kplc-officials-over-financial-irregularities-stalled-projects.
[43] Collins, "Kenya's Maasai Fear Mass Displacement."

programs like the LMCP often used to build support in marginalized constituencies.[44] Civil society plays an active role in strengthening public oversight through organizations such as The Institute for Social Accountability (TISA), which promotes grassroots participation in budgeting and service delivery, empowering communities to monitor government performance and demand transparency in energy and infrastructure planning.[45] However, local influence is often constrained when high level political or commercial interests dominate project decisions. Indigenous communities near major geothermal sites, like those in Olkaria, have repeatedly protested exclusion from land compensation and consultation processes.[46] Complaints about grid delays, inaccurate billing, or poor maintenance also frequently go unresolved, especially in remote areas where institutional responsiveness is limited.[47] As Aklin et al. emphasize, energy access is most equitable when communities can hold leaders accountable through elections, protest, or institutional channels.[48] In Kenya, these mechanisms exist, but require further strengthening to ensure that rural and marginalized voices shape the country's energy future.

Policies and Recommendations

Current Policies

Kenya's energy sector operates under a strong legal framework led by the Energy Act of 2019, which unified electricity, petroleum, and renewable energy regulation under the EPRA and tasked the Rural Electrification and Renewable Energy Corporation (REREC) with expanding off-grid and rural access.[49] The National Energy Policy (2025–2034) sets targets for universal electricity and clean cooking by 2030, a diversified renewable mix, enhanced energy efficiency, and early support for e-mobility infrastructure.[50] Additionally, the KNCTS (2024–2028) also outlines a path to universal clean cooking through appliance standards, public awareness, and market development.[51] These policies are supported by active implementation efforts. The LMCP

[44] "Kenya 2024." IEA.
[45] "Empowering Everyday Citizens to Hold Government Accountable." The Institute for Social Accountability, 2025. https://tisa.co.ke/.
[46] Collins, "Kenya's Maasai Fear Mass Displacement."
[47] "Kenya 2024." IEA.
[48] Aklin et al., *Escaping the Energy Poverty Trap*, 61.
[49] "Energy Act 2019." Energy and Petroleum Regulatory Authority.
[50] "National Energy Policy 2025 – 2034." Republic of Kenya, 2025. https://www.energy.go.ke/sites/default/files/Final Draft National Energy Policy 18022025.pdf.
[51] "Kenya National Cooking Transition Strategy, 2024 – 2028." Republic of Kenya, 2024. https://www.energy.go.ke/sites/default/files/KAWI/Strategies/KenyaNationalCookingTransitionStrategy.pdf.

has connected over 280,000 rural households since 2015, while the Kenya Off-Grid Solar Access Project (KOSAP) expands electrification in underserved counties through mini-grids and solar systems.[52] Kenya is also piloting new technologies like utility-scale BESS, EV charging infrastructure, and smart grid upgrades as part of a broader transition plan.[53]

Policy Gaps

Despite these policies, Kenya faces several persistent gaps that threaten the sustainability and equity of its energy transition. One of the most pressing issues is system losses, which exceeded 23 percent in 2023 due to outdated equipment, theft, and billing errors, well above EPRA's acceptable threshold.[54] These losses lead to blackouts, reduce revenues, and undermine investor confidence. The grid's aging infrastructure, especially in rural areas, limits the impact of new connections and remains a bottleneck despite recent voltage upgrade efforts.[55] Meanwhile, transmission investment remains underfunded. KETRACO's expansion plan to add 6,500km of new transmission lines has secured only a fraction of the $4.8 billion cost, creating risks of delay, especially in rural or remote regions.[56] Similarly, many last-mile connections remain stalled due to infrastructure deficits, land disputes, or regulatory delays.

On the financing side, while clean energy investment interest is growing, high capital costs, currency risk in power purchase agreements (PPAs), and legal uncertainty continue to limit foreign direct investment. Though Kenya's previous feed-in tariff programs attracted developers, implementing new auctions, inconsistent policy enforcement, and delays in payment to utilities deter long-term investors.[57] Socially, energy projects like the Olkaria geothermal plants and the Lake Turkana Wind Project have generated disputes over land use and insufficient community engagement, especially among Indigenous populations like the Maasai.[58] These challenges threaten to undermine Kenya's leadership in renewable energy if left unaddressed.

Policy Recommendations

[52] "KOSAP Project Components." Kenya Off-Grid Solar Access Project, April 14, 2023. https://www.kosap-fm.or.ke/kosap-project-components/.
[53] "Kenya 2024." IEA.
[54] "Kenya 2024." IEA.
[55] Mutua, John. "Kenya Power Electricity Losses Stuck above Limit." Business Daily Africa, April 9, 2024. https://www.businessdailyafrica.com/bd/corporate/companies/kenya-power-electricity-losses-stuck-above-limit--4583778.
[56] "Kenya Country Commercial Guide." International Trade Administration.
[57] "National Energy Policy 2025 – 2034." Republic of Kenya.
[58] Collins, "Kenya's Maasai Fear Mass Displacement."

To address these gaps, Kenya should prioritize grid modernization by upgrading low-voltage lines and investing in smart metering systems and fault detection technologies to reduce both technical and theft losses. Simultaneously, the government must close the transmission funding gap through blended finance and strategic public–private partnerships with risk-sharing instruments. While improvements to transmission and the overall grid are ongoing, the government should invest in shorter-term solar mini-grid solutions to increase rural energy access. Efforts to resolve the wayleave disputes and accelerate last-mile delivery, especially through rural cooperatives or local government coordination, would help ensure that electrification reaches the poorest communities. To boost foreign investment, Kenya should stabilize the PPA framework, offer currency hedging, and improve procurement transparency. Additionally, strengthening EPRA's autonomy and establishing a single office for all approvals and permitting would reduce the regulatory risk that deters private developers. Kenya must also embed social inclusion and resilience into energy planning by enforcing Free, Prior, and Informed Consent (FPIC) and ensuring community benefit-sharing in large-scale energy contracts.[59] Finally, scaling battery storage can improve reliability while insulating the grid from climate shocks like droughts that threaten hydropower. By aligning infrastructure investments with institutional reform and community inclusion, Kenya can realize its goals of universal energy access, climate-smart development, and sustainable economic growth.

Analysis & Conclusion

Kenya stands at a critical juncture in its clean energy transition. Over the past decade, the country has achieved remarkable progress, expanding national electricity access from 37% in 2013 to 79% in 2023, and generating 90% of grid electricity from renewables.[60] Yet, beneath these national milestones lie persistent disparities and three key overlapping challenges: 1) expanding energy access for rural communities, 2) improving institutions and regulatory clarity, and 3) ensuring a secure and climate-resilient clean energy transition.

[59] "Free Prior and Informed Consent." United Nations, October 14, 2016. https://www.un.org/development/desa/indigenouspeoples/publications/2016/10/free-prior-and-informed-consent-an-indigenous-peoples-right-and-a-good-practice-for-local-communities-fao/.
[60] "Kenya 2024." IEA.

To close the rural electricity access gap, the government should prioritize last-mile grid expansion by creating a dedicated Rural Electrification Fund backed by public-private partnerships and concessional finance. KPLC and REREC should be mandated to meet measurable rural access targets, tied to performance benchmarks such as reduced connection time, voltage stability, and geographic coverage. Where grid extension is not feasible, the government should promote community-led mini-grids by providing concessional loans, simplifying land-use permitting, and offering technical assistance. A tailored adaptation of the Grameen Shakti model from Bangladesh could empower local ownership, enhance productive energy use, and build sustainable rural energy systems.[61] In parallel with rural electricity access, the lack of clean cooking access must be addressed. Kenya can improve clean cooking access by expanding pay-as-you-go liquified petroleum gas systems and microfinancing for stoves, removing import duties on clean cooking technologies, and scaling results-based financing to incentivize private providers.

Kenya must also address weaknesses in institutional capacity and regulatory clarity. While agencies like EPRA, KPLC, and KenGen have enabled important progress, fragmented responsibilities, delayed licensing, and opaque procurement processes continue to undermine sector performance and investor confidence. The government should establish a National Renewable Energy Procurement Framework with binding, annually escalating targets for utilities and public institutions. This framework should include standardized PPAs, clear grid connection rules, and transparent auction processes to reduce transaction costs and speed renewable deployment. Also, permitting and licensing should be consolidated into a single digital platform that tracks timelines, minimizes bureaucratic discretion, and improves investor predictability. Finally, the government should institutionalize community engagement in energy planning, requiring stakeholder consultations in all rural electrification and utility investment programs. This will strengthen transparency and ensure that local priorities are reflected in national plans.

As Kenya moves toward universal access and climate goals, it must ensure that its energy transition is secure, resilient, and equitable. Growing demand and variability from solar and wind will require significant grid upgrades and smarter planning. The Ministry of Energy should develop a national grid integration strategy for variable renewables, including investments in

[61] Aklin et al., *Escaping the Energy Poverty Trap*, 207.

flexible backup generation, interconnection, and utility-scale BESS. Clean energy procurement targets for public agencies should be made mandatory and enforceable, with penalties for noncompliance and transparent annual reporting. Lastly, all major energy investments should be required to undergo climate risk assessments and integrate resilience measures such as drought-proofing and hardening infrastructure against extreme weather. These steps will help ensure that Kenya's clean energy leadership is not only sustained but strengthened in the face of growing climate and development pressures.

In summary, Kenya stands as a regional leader in renewable energy, yet critical challenges threaten to stall its progress. Bridging the rural energy divide, modernizing fragile grid infrastructure, and building climate resilience are essential to realizing a just and sustainable transition. With strong political will already in place, Kenya's success will now depend on translating ambitious policies into action through bold institutional reform, inclusive planning, and long-term investment. If these gaps are addressed, Kenya can not only secure energy access for all its citizens but also serve as a model for equitable clean energy transitions across Sub-Saharan Africa.

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* While this source is not peer reviewed, or as credible as established news networks, it was included due to its relevance and timing in relation to writing this paper as an example of ongoing corruption.