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At what price? The political economy of mini-grid electricity development and deployment in Kenya

Mbeo Ogeya*[1], Jacqueline Senyangwa[1], and Fiona Lambe[1]

Key Messages

- Mini-grid electricity can have a significant contribution to universal access to electricity, especially in the sparsely populated, underserved, and island communities who are mostly poor.
- The political economy surrounding their deployment has far reaching tariff consequences.
- Even so, within the Kenyan context, mini-grids deployment requires cross subsidies to ensure equity and fairness in electricity access.
- Furthermore, dedicated policy, regulations, and clear strategies are required to manage the politics of power and material interest that negatively influences tariff setting: the contribution of critical actors' networks is key for change.

Rural community connected with mini-grid electricity. Over 50% no longer use the electricity mainly due to electricity price

Introduction

Extending grid electricity to remote rural communities is expensive and has low demand density [1–2], leading to slow rates of rural grid electrification. Off-grid solutions – mini-grid, standalone, and distributed systems – are hence favoured for these regions. Mini-grids are community-scale electrical distribution networks, operating autonomously from the grid. They can provide low-cost electricity far from the grid. Even so, due to the high infrastructural and equipment cost, the set tariffs are often several times higher than grid electricity tariffs, raising questions of fairness and justice in electricity access.

Tariff injustice is exacerbated by the political economy factors surrounding mini-grid development [3]. Adopting the definition of Atteridge and Weitz, political economy broadly focuses on how resource allocation and development outcomes are shaped by the distribution of power, material, and ideational factors that influence the behaviour of various actors [4]. Power manifests in many forms including security, money, and stakeholder influence [4]. Electricity access is a political issue and often overlaps with the vested interest of individuals seeking to make money and increase local influence, fame, and prestige. Mini-grid development and deployment is thus a sociotechnical phenomenon.

Methodology

In the policy brief, we conduct an analysis of how power, interests, and politics play out within the structural aspects of a technological innovation system. This is done via a case study in the context of Kenya. Technological innovation system (TIS) is an analytical concept that seeks to analyse the development, deployment, and use of new technologies. It is defined as a network of agents/actors interacting in an economic field within a set of rules, regulations, and norms to promote the

development, diffusion, and use of technology [5]. The analysis is mostly desk-based, reviewing peer reviewed and non-peer reviewed literature which is corroborated with testimonies from key informant interviews. Nine interviews were conducted: 2-public utility, 1-regulator, 1-private developer, 3-financiers, 1-policy maker, and 1-energy consultancy firm. These interviewees we considered most important in mini-grid development. The interview covered five categories of topics: evolution of mini-grid development, tariff setting and policy, actors' interaction, innovation functions, and political economy.

The evolution of mini-grid development in Kenya

Mini-grid history in Kenya dates to the 1980s [6], dominated by public utility investment until recently when, in 2011, the first private sector led company was licensed. The growth of public mini-grids has been steady, almost tripling generation (from 20 GWh to 56 GWh) in just about a decade between 2002–2013. By 2015, there were about 22 public owned mini-grids and 10–15 private sector sites. The growth has continued such that, by 2020, the Africa Minigrid Developers Association (AMDA) reported 192 mini-grids and standalone systems. Future development prospects include the Kenya National Electrification Strategy (KNES) 2018–2022, targeting 35,000 homes [7], and the Kenya Off-Grid Solar Access Project (KOSAP), targeting 121 mini-grids in 14 underserved counties connecting a total population of 250,000 homes [8] by 2022.

The political economy of mini-grids

In the sub-sections below, we discuss the influencing political economic factors within the structural elements of mini-grid TIS (actors, networks, and institutions) for Kenya.

a. Actors' relationship

There are about 18 different mini-grid actors in Kenya broadly categorized as government agencies, value chain, and business environment actors. We considered the following actors most important in our analysis of the political economy: government agencies (Energy and Petroleum Regulatory Authority, the Ministry of Energy, and the county government), value chain actors (Kenya Power and private developers), and donor agencies and community within the business environment.

We find that 'power' and 'entitlement' are greatest at national level between public utility and the private developers. This is because the Kenyan mini-grid development landscape has in the past decade attracted private investments creating competition between private developers and the public utility. Mini-grid development and deployment was historically dominated by the national utility on behalf of Rural Electrification and Renewable Energy Corporation (REREC). As such, due to how it has been established, the national utility enjoys state privileges and public financing, including priority in selecting sites and national cross subsidies. Because of the cross subsidies, deployed public utility mini-grids are cheaper than private tariffs. Moreover, from the interviews, it is reported that some private sector sites had to be relinquished to the public utility. Some private mini-grid investments are already threatened by grid encroachment and public utility mini-grids were subsequently established in close proximity to private mini-grids. Interviewees think that the emergence of private mini-grid developers, after 2010, was driven by donor interests. This interest purported to be due to inefficiency, accountability, and political challenges that faced the national utility, as well with the aim of tackling the monopoly and dominance of the national utility.

Moreover, most private sector mini-grids are based on renewable energy sources, such as solar, and require land which further attracts green and climate financing opportunities in the global climate change landscape. **However, they are affected by county and community level dynamics**. Depending on the political landscape, the community are often persuaded to embrace or reject the technology, affecting project success. In other instances county governments may decline site approval based on multiple factors, including the perceived political affiliation of the developer as energy access is used as a campaign tool. Time lost, vested interests, and site allocations are directly related to development cost that is eventually reflected in consumer tariffs. Notable instances of carefully crafted collaboration between local politicians and communities have negatively affected development, yet other counties have positively approached developers to subsidize the cost of installation in order to reduce mini-grid tariffs.

b. Network activities

There are three main networks in the off-grid electricity sector, the Kenya Renewable Energy Association (KEREA), Africa Minigrid Developers Association (AMDA), and GOGLA, the global association

for the off-grid solar energy industry. **Networks are thought to be well coordinated in Kenya and have created a learning environment, knowledge sharing, and interest lobbying**. Recently – in a coalition of purpose – the networks appealed to the government to reinstate a tax exemption on solar PV products which was granted in the Finance Act of 2021. The tax exemption will possibly lower mini-grid electricity tariffs increasing private sector competitiveness. The donor working group has been very instrumental in capacity building of developers, financing and supporting navigation through rather complex approval processes. Moreover some donors have engaged local banks in financial management with an intention to popularize local mini-grid financing instruments through asset or equity financing.

c. Institutions

The electricity sector development in Kenya is governed by three main policy and regulatory instruments: the National Energy Policy of 2018, the Energy Act of 2019, and the Kenya National Electrification Strategy (KNES) 2018–2019. The three policy documents are grid focused with inadequate articulation of mini-grids. Moreover, the interviewees think that the KNES was a political gimmick that fitted well with the 2017–2022 political regime and was a means of attracting investors in the electricity sub-sector. **The institutional and legislation gap made the none-documented licensing procedure a chaotic negotiation** between developers and village kingpins, county governments, and administration units during site selection, land rights, community, and county approvals. Giving opportunity for manifestation of vested interests in the form of hiked land values, abnormal approval fees, and process delays. **Draft mini-grid regulation seeks to regulate the sector; however, it is unclear how it will be applied in public utility mini-grids**. Additionally, the draft regulation provides for exclusive site reservation; it does not protect from grid encroachment; it acknowledges cross subsidy for public utility but has no provision for private developers; and it provides for compensation upon encroachment but it is not clear how this will be achieved. Nonetheless, interviewees think it is a positive way forward towards effective governance of the growing mini-grid landscape.

Conclusion and Recommendations

Mini-grid development is key to universal electricity access in Kenya and both private and public sector participation is important. Indeed, the Kenya Off-Grid Solar Access Project (KOSAP) has been designed to foster public–private sector partnership (PPP), leveraging on private sector technological capability and knowledge and enabling interactive learning – where proactive interaction between public and private sector actors leads to knowledge exchange – while also harmonizing mini-grid electricity cost. However, the prevailing political economic factors (power, political interference, and material interest) may persist. We thus propose the following recommendations for sustainable and effective mini-grid deployment in Kenya:

- **The emerging interest in mini-grid calls for clear policies and regulation at national and county level**. This should address aspects of project planning, preparation, and development as well as community engagement. The role of county government support is key in tackling land acquisition and community liaison issues in early stages of mini-grid development.
- **A more public–private partnership approach would be most preferred in future mini-grid development**. Rural electrification is a social responsibility for the government and fairness and equity in electricity access is important. On the other hand, the private sector has the capacity to accelerate rural electrification and technological advancement. A more synergistic approach will reduce conflict between private and public mini-grids, unfair competition, and enhance efficiency.
- **Tax exemptions and cross subsidies should be considered**. It is the government's responsibility to connect every homestead to grid or off-grid electricity. Given that cross subsidies are awarded to the utility, the same should be extended to private sector investors. The recent growth of private sector involvement in mini-grid will ensure rapid electricity access in rural areas.

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Notes

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Author Information

Affiliations

[1] Stockholm Environment Institute

**corresponding author*

Email: mbeo.ogeya@sei.org