



## Danish Institute for International Studies

### The political economy of mini-grids in Ghana

Policy ambitions versus the realities of implementation

Abubakari, Abdul-Bassit

*Publication date:*  
2025

*Document Version*  
Publisher's PDF, also known as Version of record

[Link to publication](#)

*Citation for pulished version (APA):*

Abubakari, A.-B. (2025). *The political economy of mini-grids in Ghana: Policy ambitions versus the realities of implementation*. (4 ed.) Danish Institute for International Studies (DIIS). DIIS Working Paper Vol. 2025 No. 4

#### General rights

Copyright and moral rights for the publications made accessible in the public portal are retained by the authors and/or other copyright owners and it is a condition of accessing publications that users recognise and abide by the legal requirements associated with these rights.

- Users may download and print one copy of any publication from the public portal for the purpose of private study or research.
- You may not further distribute the material or use it for any profit-making activity or commercial gain
- You may freely distribute the URL identifying the publication in the public portal ?

#### Take down policy

If you believe that this document breaches copyright please contact us providing details, and we will remove access to the work immediately and investigate your claim.



# **THE POLITICAL ECONOMY OF MINI-GRIDS IN GHANA: POLICY AMBITIONS VERSUS THE REALITIES OF IMPLEMENTATION**

**Acknowledgements**

Working Papers make DIIS researchers' and partners' work in progress available to readers prior to formal publication. They may include documentation which is not necessarily published elsewhere. DIIS Working Papers are published under the responsibility of the author alone.

The paper has received financial support from the Ministry of Foreign Affairs of Denmark via the Energy Struggles – Renewable Energy in Africa research project, which is administered by the Danida Fellowship Centre. The research results are independent, and the views and opinions expressed reflect the views of the author alone.

**Abdul-Bassit Abubakari**

PhD student, University of Ghana  
bassitramadan29@gmail.com

**DIIS WORKING PAPER 2025: 04**

DIIS · Danish Institute for International Studies  
Gl. Kalkbrænderi Vej 51A, DK-2100 Copenhagen, Denmark  
Tel: +45 32 69 87 87  
E-mail: diis@diis.dk  
www.diis.dk  
ISBN 978-87-7236-194-9 (pdf)

DIIS publications can be downloaded free of charge from [www.diis.dk](http://www.diis.dk)  
© Copenhagen 2025, the author and DIIS

# **THE POLITICAL ECONOMY OF MINI-GRIDS IN GHANA: POLICY AMBITIONS VERSUS THE REALITIES OF IMPLEMENTATION**

**Abdul-Bassit Abubakari**

# TABLE OF CONTENTS

<b>Abstract</b>	<b>2</b>
<b>Introduction</b>	<b>3</b>
<b>Theoretical framework</b>	<b>5</b>
<b>Ghana's political context and the nature of the political settlements</b>	<b>6</b>
<b>Methodology</b>	<b>7</b>
<b>Background: The origin of the idea of electrification through mini-grid renewable energy</b>	<b>8</b>
<b>Phase 1. The design and early implementation of renewable energy mini-grids (2007-2013)</b>	<b>10</b>
Design of the GEDAP renewable energy mini-grid component	11
Disagreement over control delays implementation	11
<b>Phase 2. Policy-making during implementation (2013-2019)</b>	<b>13</b>
Agreement and moves towards implementation	13
Implementation delays amidst disagreements over ownership	14
<b>Phase 3. 2019–reversal and reconfiguration of the approach to renewable energy mini-grids</b>	<b>16</b>
Complete reversal on private renewable energy mini-grids and implications for Black Star Energy	16
VRA's disinterest and the Ministry of Energy's reliance on state utilities for the management and operation of mini-grids	17
<b>Discussion</b>	<b>18</b>
<b>Conclusion</b>	<b>20</b>
<b>References</b>	<b>22</b>

## **ABSTRACT**

Despite Ghana's explicit plans to deploy mini-grids for the electrification of off-grid and remote communities, progress has been slow. This paper explores how political dynamics and policy shifts have shaped the governance of mini-grids over time. It examines the evolution of mini-grids in Ghana in three phases: preliminary design stage (2007–2013); active implementation period, marked by policy modifications (2013–2019); and subsequent consolidation under a predominantly public-led model post-2019. Guided by an adapted political settlements framework and process tracing methodology, the paper argues that misalignment between the government of Ghana and donors over governance and ownership models, mediated by the country's competitive clientelist politics, explains Ghana's limited progress in the development of mini-grids. The paper provides nuanced insights into the complex ways transnational factors and domestic politics interact in shaping the development of mini-grids with wide implications for debates on energy governance and reform in sub-Saharan Africa.

## INTRODUCTION

Sub-Saharan Africa is one of the least electrified regions globally, with nearly 580 million people having no access to electricity (Baker and Bukari, 2022). This energy poverty is more pronounced in rural and hard-to-reach areas where grid extensions are often extremely expensive and logistically difficult (Nuru et al., 2021). The potential of mini-grids as a promising solution is widely recognised, aligning with Sustainable Development Goal 7: ensuring access to affordable, reliable, sustainable and modern energy for all by 2030 (Nuru et al., 2021; Nyansapoh et al., 2022; Peters et al., 2019). Not only can renewable mini-grids enhance access to modern energy in remote rural communities, they can also help ease the pressure on overburdened centralised grids and thus potentially increase the reliability of energy supplies for those already connected.

However, the deployment of renewable mini-grids across the region has generally been slow and uneven, even in countries like Kenya, Senegal, Nigeria and Cape Verde, which have all seen some progress (Baker et al., 2022; Odarno et al., 2017; Bukari et al., 2021; Sesan et al., 2024). For instance, in Mozambique 69 mini-grids are reported to be non-operational due to a lack of maintenance (Victor, 2023). Similarly, in Malawi, none of the six mini-grids installed by the government survived over time, as insufficient funds for their maintenance led to their collapse (*ibid.*). In Ghana, despite ambitious plans to utilise mini-grids for rural electrification, only five are operational, serving less than 0.5% of the rural population (Bukari et al., 2021).

Scholarly literature has sought to offer reasons for these outcomes, with many studies placing strong emphasis on technical explanations as barriers to mini-grid deployment (Alhborg, 2018; Sovacool, 2018). Factors such as poor technical design, policy and regulatory deficiencies, and a lack of efficient planning, infrastructure and funding inadequacies are often cited (Ha and Kumar, 2021; Francis et al., 2022; Sovacool, 2018; Christiaensen & Heltberg, 2014). Although these socio-technical explanations offer critical insights, they rarely discuss in much detail the broader political and economic context that shapes the development of mini-grids.

Emerging evidence suggests that political economy plays a crucial role in determining their success or failure (Baker et al., 2022; Ackah et al., 2021; Boamah, 2010). This corroborates recent scholarship suggesting that politics underlies many development challenges and policy adoptions in developing countries (Lavers and Hickey, 2016; Hughes & Lipsky, 2013). In other words, the limits of existing techno-economic explanations necessitate a more holistic political economy analysis.

Using Ghana as a case study, this paper examines how policy shifts, political dynamics and the interests of key actors have influenced the governance of mini-grids over time. The analysis maps the evolution of Ghana's mini-grid sector through three distinct phases: the preliminary design stage (2007–2013); the active implementation period, marked by policy modifications (2013–2019); and the subsequent consolidation under a predominantly public-led model post-2019. By unpacking these developments, this study highlights the interplay between political commitments, institutional dynamics and the broader governance framework shaping mini-grid deployment in Ghana.

Ghana has had explicit ambitions to deploy mini-grids since at least 2007, when the Ghana Energy Development and Access Project (GEDAP) was agreed by the government and the World Bank, but progress has been limited (Korzhenevych and Owusu, 2021; Amuzu-Sefordzi, 2020).

While some studies have attempted to explain this stagnation through a political economy lens, they attribute it mainly to a lack of political commitment and unfavourable regulatory policies, which have deterred private-sector participation and, by extension, slowed deployment (Ackah et al., 2020; Bukari et al., 2021; Nuru et al., 2021; Victor, 2023). However, these explanations raise further critical questions: Why is political commitment lacking? Why have regulatory policies remained unfavourable, despite the clear ambitions of successive governments? These unanswered questions point to deeper political economy issues and power dynamics that remain inadequately explored in the existing literature.

This study aims to analyse and develop such explanations further by applying an adapted political settlement framework that can help analyse the relationship between targets and implementation in developing-country contexts. The paper puts forward two arguments. First, it argues that the deployment of renewable energy mini-grids has been slow and uneven due to a misalignment of interests and ideas between the government of Ghana and donors led by the World Bank over the governance and ownership models. For example, how do their interests and ideas diverge, and how have these undermined the deployment of renewables? Secondly, and relatedly, it suggests that the government's position is influenced by Ghana's highly competitive political settlement, which has catered for short-term decision-making aimed at winning elections.

This political context often favours initiatives that yield immediate, tangible benefits for voters, such as extending the national grid or subsidising utility tariffs over less prestigious projects like renewable mini-grids. For example, grid-extension projects, which can be showcased as achievements during election campaigns, often take precedence despite their higher cost and logistical challenges in rural areas. Similarly, subsidies for fossil fuels and conventional sources of energy are maintained to appease key constituencies, even though they undermine investments in renewable energy solutions. On the other hand, minigrids are typically seen as long-term reforms due to their systemic and transformative nature, which requires extensive stakeholder collaboration before their benefits become fully visible.

In addition to the above, institutional dynamics underpinned by turf wars between key state agencies further complicate the governance of mini-grids. These turf wars are rooted in overlapping mandates, power play and conflicting priorities among agencies responsible for energy policy and regulation. For instance, whilst the Energy Commission, the regulator of the energy sector, shows more openness to private-sector participation in mini-grids, the Ministry of Energy (MoE) responsible for policy-making formulation favours a more state-led approach, highlighting a preference for government control of critical energy infrastructure. These different institutional positions are not merely based on their different mandates: they are more rooted and tied to the broader political economy of energy governance in Ghana.



### **BOX 1. WHAT IS A MINI-GRID?**

Unlike the main grid, which is a large-scale system that supplies electricity to many areas or regions, including urban and rural settings, mini-grids serve localised areas, typically a small village or rural community. While some definitions employ size or capacity as the defining characteristic, others define mini-grids as falling within the 5–200-kilowatt (kW) range, with some extending to 300 kW (Tanai, 2019). Franz et al., (2014) characterises mini-grids as comprising small-scale power generation (from 10kW to 10MW) and the distribution of power to a limited number of consumers using a distribution grid that functions independently of the national electricity transmission systems, supplying concentrated settlements with power at grid-quality level. Typically, minigrids have integrated power systems covering generation (solar, wind, and hydro), energy storage (batteries) and distribution, allowing a seamless electricity supply to defined areas or communities. Depending on the locality, a mini-grid electricity-generating infrastructure increasingly utilises solar energy, but it can also include other renewable energy technologies such as solar, wind, and small hydro, as well as diesel gensets to support generation or serve as backup.

## **THEORETICAL FRAMEWORK**

The paper draws inspiration from an adapted political settlements approach, a theoretical framework that has gained considerable attention as a way of improving understand of the interplay between politics and development, particularly in Africa (Abdulai, 2018; Behuria et al., 2017). This approach examines how power is distributed and exercised among different groups in a society, and how these power dynamics influence the design and implementation of policies and institutions. Central to this framework is the argument that development outcomes are not solely determined by the presence of formal institutions but are significantly shaped by the power configurations and informal political arrangements that underpin them. This view explains why similar institutional set-ups can produce very divergent development outcomes because the underlying configurations of power that drive institutional effectiveness are different (Khan 2010; see also Abdulai and Appiah, 2023). The variations stem from different power structures, which shape resource distribution, institutional effectiveness and policy outcomes.

In particular, we take as our point of departure the framework by Kelsall et al., (2022), which identifies two dimensions that shape political settlements. The first dimension looks at the distribution of power among political elites, differentiating between concentrated and dispersed power groups or structures. In concentrated settlements, power is in the hands of a few elites who exercise and maintain control over political and economic decision-making. This settlement often facilitates decision-making, enabling governing elites to attain broad policy objectives without the need for continuous renegotiation among factions. However, it may also lead to exclusionary governance and the prioritising of elite interests (*ibid.*). Conversely, in dispersed settlement, power is distributed across multiple and different competing groups, reflecting a more inclusive and pluralistic approach, though it can also lead to a fragmented governance structure. The dispersion could give rise to increased political conflict, protracted decision-making and difficulty in maintaining long-term reforms.

The second dimension emphasises the social foundations of the settlement, differentiating between broad settlements that encompass a diverse range of social groups and interests and narrow settlements, which primarily cater to the interests of a limited elite. Broad settlements are made up of many social groupings, including marginalised groups, and they often promote enhanced social cohesiveness and legitimacy. However, they may encounter difficulties in balancing competing demands. On the other hand, narrow settlements cater exclusively to the interests of a select few, often favouring the elite or politically powerful groups. Here, Kelsall et al., stress that the distribution of power is influenced by the breadth and depth of the groups that uphold but may also disrupt a settlement (ibid., 219). These social foundations include, for instance, economic, religious, political and organisational groups. A settlement with broad and inclusive social foundations may foster greater legitimacy and stability, while narrow foundations may render it more fragile.

## **GHANA'S POLITICAL CONTEXT AND THE NATURE OF THE POLITICAL SETTLEMENTS**

Rooted in its historical evolution, Ghana's political landscape is shaped by its colonial past, post-independence struggles and the emergence of multiparty democracy. In the post-colonial period, Ghana's political settlements trajectories have shown shifts between competitive clientelism (1951-1966), authoritarianism (1966-1981), dominant party rule (1982-1992) and a return to competitive clientelism from 1993 to date (Abdulai and Mohan, 2019). In the early post-colonial era, the decolonisation process was not greatly marked by a struggle between the British colonial authorities and the broader Ghanaian society. Instead, it was more of a power struggle among a group of Ghanaian elites (Ayanoore, 2018). Spearheaded by an educated elite, J.B. Danquah and an influential businessman, Paa Grant, the United Gold Coast Convention was the first political force, formed in 1947 to campaign for independence from the British.

The Convention People's Party (CPP) led by Kwame Nkrumah won elections in the early post-colonial period, namely in 1951, 1954 and 1956. The CPP leveraged these electoral victories to increase its popularity and to establish a firm grip on the country's political landscape. Despite the CPP's dominance, the existence of strong excluded elite factions, mainly UGCC members and chiefs from the Ashanti Region mobilised under the Progress Party, meant that it remained highly vulnerable. Nkrumah's vulnerability and opposition to him and the CPP also deepened due to exclusionary tactics and strained relationships with key party allies who opposed some of his economic and fiscal policies (Killick, 2010). Notable among them was Komla Gbedemah, Ghana's first Minister for Finance who was eventually dismissed for opposing Nkrumah's manipulation of fiscal policies for largely political gains (Whitfield, 2018).

These internal and external oppositions threatened the CPP's ability to maintain strong cohesion and rendered the settlement highly unstable. Unsurprisingly, by the latter years of Nkrumah's rule, the country's economy began to witness consistent negative growth rates, coupled with growing public dissatisfaction (Tignor, 2006). This early post-colonial rule ended in 1966 in a military takeover. The end of Nkrumah's rule, which largely consisted of a centralised political settlement, ushered in a new era of vulnerable authoritarianism in Ghana's political dynamics.

Six regime changes between 1966 and 1981 marked a time of continuous power struggles and great factional conflict among political elites (Whitfield, 2018). This period saw military takeovers in 1972, 1978, 1979 and 1981 with two periods of democratic rule led respectively by Kofi Busia (1969-1972) and Hilla Liman (1979-1981) by. Consequently, no political coalition could hold power for very long, as the country oscillated between periods of constitutional rule and military governments. Strong resistance from excluded coalitions created difficult conditions for ruling elites to consolidate their regimes.

The political settlement was dominant from 1982-1992. J.J. Rawlings, who acted under the name of the Provisional National Defence Council (PNDC), led the ruling coalition to establish a strong degree of cohesion among its ruling elites. Although largely a military regime, the PNDC succeeded in galvanising relative political approval from the population as it pursued populist policies which were firmly backed by popular forces (Gyimah-Boadi, 1990). Indeed, not only did Rawlings topple a constitutional government in 1981, but his regime also succeeded in establishing a new crop of ruling elites who derived their power and legitimacy from their association with him. Essentially, the political settlement during this period was marked by the concentration of power around a single dominant leader, with minimal power dispersion among the ruling elites.

The country returned to multiparty democracy in 1993. Since then, Ghana's political settlements have been characterised by competitive clientelism (Abdulai, 2021; Hirvi and Whitfield, 2015). This settlement is marked by a high degree of competition among political elites, who rely on patronage networks to secure electoral support. Consequently, governing elites operate under a persistent degree of vulnerability, which drives them strongly to follow policies that prioritise immediate gains and consolidate electoral support, mostly at the expense of long-term development initiatives.

Equally significant is the dimension of transnational actors, as evidenced by the works of Ayanoore (2017) and Abdulai (2021). They argue that ideas, ideologies and the influence of transnational actors play a critical role in shaping development outcomes in developing countries. These actors often introduce external pressures, funding and ideational frameworks that interact with domestic political and institutional dynamics, contributing to a more nuanced understanding of the politics of development. By integrating both domestic and transnational perspectives, this view enriches the analysis of how power, ideas and external influences intersect to shape development trajectories in contexts like Ghana.

## **METHODOLOGY**

By focusing on political settlement dynamics at the sector level, this study seeks to provide insights into how the interplay of ideas, the roles of transnational actors and domestic political coalition dynamics contribute to a more nuanced understanding of the development of mini-grids in Ghana. The study used process-tracing as a methodological approach to connect the political settlements framework with the empirical analysis of mini-grid development in Ghana. As noted by Collier (2011: 2), process-tracing requires finding diagnostic evidence that provides the basis for descriptive and causal inferences. Ultimately the aim was to go beyond examining mere correlations. Rather, the study sought to establish whether particular factors were necessary and/or sufficient to cause specific outcomes (Beach, 2016).

Process-tracing was particularly suitable for a systematic analysis of the causal mechanisms by which domestic political elites, transnational actors and sectoral policies interacted to shape the governance of mini-grids in Ghana. For example, using this approach allowed the study to track and identify the causal factors around key policy decisions, including the adoption of a public-led model for mini-grids in Ghana, the timing of policy announcements, the continuous placement of mini-grid projects under state utilities and the implications of all these for private-sector participation.

The study employed a semi-structured interview approach with key informants and a review of relevant documents. Twenty in-depth interviews were conducted with senior officials from the Ministry of Energy, Energy Commission, Volta River Authority, academics/experts and Trama Tecno Ambiental (TTA). Respondents were purposively selected based on their expertise and involvement in the design and implementation of mini-grid projects. Also included were some beneficiaries of GEDAP mini-grids. Interviews were conducted both in person in Accra and in the Volta Island communities of Peditorkope and Kudorkope, as well as via Google Meet with a TTA official residing abroad. Accra was selected as it is the administrative and political capital of Ghana where key institutions involved in energy governance are located, including regulators, policy-makers and private-sector actors.

Conducting interviews in Accra allowed for direct engagement with officials from the Ministry of Energy, the Energy Commission and other relevant institutions. The Volta Island communities of Peditorkope and Kudorkope, on the other hand, were selected as case-study sites due to their unique experience with mini-grid implementation. These communities are among the few in Ghana where renewable mini-grids have been deployed as part of efforts to electrify hard-to-reach rural areas. Data collection took place between March and September 2024. All interviews were audio-recorded, transcribed verbatim, and analysed thematically. To ensure confidentiality, participants provided informed consent before each interview. In analysing the data, the study delved into the political economy context of mini-grid development in Ghana, focusing decision-making processes, the interplay between domestic and transnational actors, and the broader policy environment.

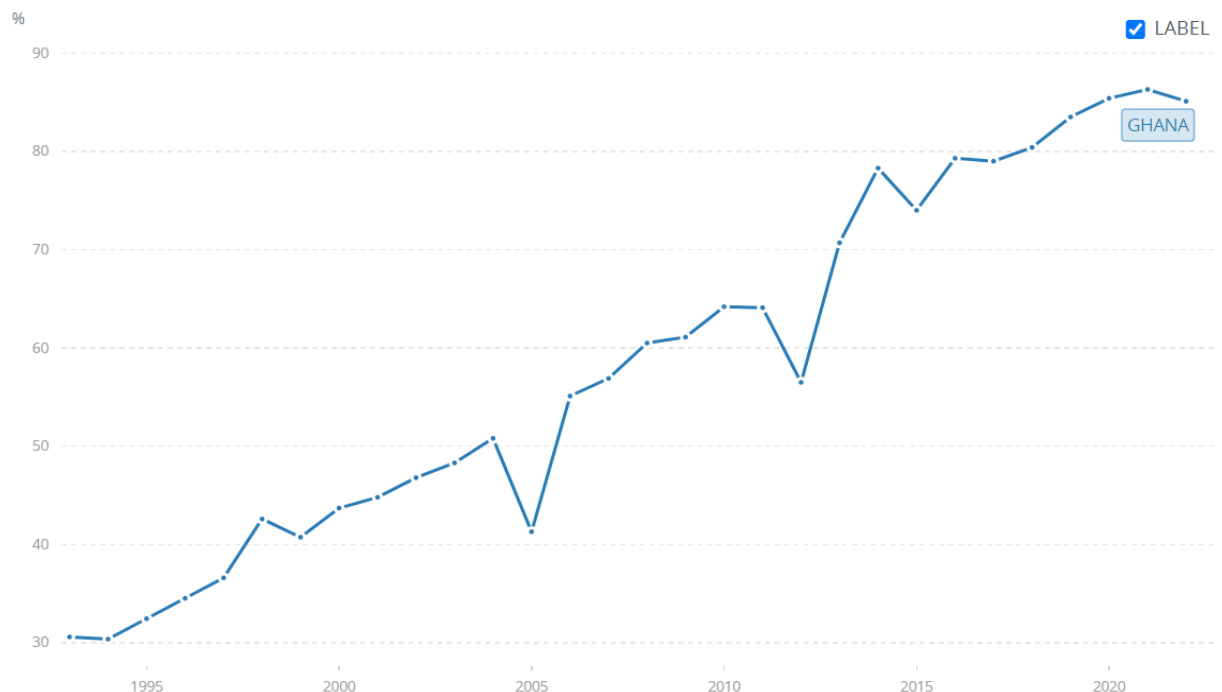
## **BACKGROUND: THE ORIGIN OF THE IDEA OF ELECTRIFICATION THROUGH MINI-GRID RENEWABLE ENERGY**

With the agreement on GEDAP between the government and the World Bank in 2007, Ghana adopted the idea of developing a programmatic approach towards promoting renewable mini-grids. However, the idea of using renewable sources for rural electrification has been on the energy agenda since the late 1980s (Amankwah-Amoah and Sarpong, 2016). In 1989, the Ghanaian government, in line with a new World Bank loan, stated that it 'wishes to consider the expansion of electricity supplies to all parts of the country within thirty years' (World Bank 1989: 32). Subsequent plans echoed this statement on universal access, which eventually played an important part in the sector's future developments (Energy Commission, 2012). A National Electrification Scheme and a Self-Help Electrification Programme in 1990 were carried out over the following decades with substantial donor support and concentrated on the grid. Self-Help Electrification, a significant programme in Ghana until today, enables communities to connect to the grid via their own contributions (Cuesta-Fernandez 2018; Johnson et al.,

2020). Though experiments with new renewables took place at the time, it never became an integral part of rural electrification.

Providing access to electricity became part of the then Rawling administration's efforts to build a rural support base, which became important in maintaining power after the reintroduction of multiparty democracy in 1992. As noted by Cuesta (2018), the self-help electrification programme proved a useful political tool. Its requirement of community contributions provided avenues for some District Assemblies headed by political appointees (MCEs/DCEs) and some MPs to turn the whole project into the basis for patron-client relationships primarily targeting political gains by financing equipment and connections. Though displaying some ideological differences, the two dominant political parties – the National Democratic Congress (NDC), which espouses a left-of-centre ideology, and the New Patriotic Party (NPP), which claims a right-of-centre stance – display little difference in how they emphasise electrification or an overall market-led economy that also came to encompass power production.

**Figure 1. Access to electricity in Ghana 1993-2022**



Source: World Bank <https://data.worldbank.org/indicator/EG.ELC.ACCS.ZS?locations=GH>

In the following years, the access agenda in Ghana got coupled with the gradual unbundling and liberalisation of the energy sector. Since the early 1990s, Ghana, like many African countries, has come under pressure from Western donors headed by the World Bank to unbundle as part of reforms to the energy sector (Pedersen et al., 2021). As in most African countries, this resulted in a hybrid system in Ghana, characterised by substantial state involvement. Though not uncontested, there was some high-level domestic political support for reform in Ghana, which went further than most countries in unbundling (ibid.).

Over the following couple of decades, the country received two regulatory bodies (the Ghana Energy Commission and the Public Utilities Regulatory Commission (PURC)) just as the number of public utilities in generation, transmission and distribution increased, all of which contributed to the fragmentation of the sector's governance (Asante et al.,

2021). This interest in setting up new organisations may have to do with patronage politics, i.e. how successive governments use the hiring of employees to reward political allies.

With time, the country also received a substantial share of its electricity supply produced by private Independent Power Producers (IPPs). The promotion of private-sector participation through mini-grids was ostensibly meant to re-echo the liberalisation of Ghana's energy sector. Until the mid-2000s, renewable mini-grids only played a much smaller role in Ghana's electrification. In 1992, the country had commissioned an RE mini-grid called the Appolonia Integrated Rural Energy Project as an alternative source of energy for rural communities (REMP, 2019). However, it was a small pilot project aimed at testing the feasibility of using biogas as an alternative energy source in rural Ghana, and it fell into disrepair in the following years (Hyde, 2010).

GEDAP, as a potentially more programmatic approach to renewable energy mini-grids, emerged gradually from 2005 when the first programme documents of what would become GEDAP emerged, combining a continued emphasis on electrification with increasing the supply of renewable sources funded by the government and World Bank institutions. The Global Environment Facility (GEF), which was managed by the World Bank, was envisaged as contributing USD7 million 'in support of its policies on removal of barriers for renewable energy sources and energy efficiency' (REF).

In 2006, Ghana's Energy Commission launched a Strategic National Energy Plan, which set itself a 10% target of renewable energy by 2020 as part of broader efforts to diversify sources of energy supply. To reach the 10% goal in the plan, rural electrification was considered crucial. The government therefore committed itself to examining various options, including decentralised and mini-grid technologies, to lower the cost of providing utility power to rural populations. In 2007, the GEDAP project came with more significant World Bank involvement than had been indicated in the early GEF documents and was linked to this 10% target. There is thus no doubt that transnational actors played a pivotal role in advocating the diversification of the country's energy sources to include renewables through GEDAP, but also that there was some buy-in from the government of Ghana (World Bank, 2007, Amuzu-Sefordzi, 2020).

## **PHASE 1. THE DESIGN AND EARLY IMPLEMENTATION OF RENEWABLE ENERGY MINI-GRIDS (2007-2013)**

This period marks the first phase, laying the groundwork for mini-grid development in Ghana as part of the broader efforts to increase and expand energy access in remote and island communities through off-grid energy solutions. Driven mainly by GEDAP with substantial support from the World Bank and other development partners, this period focused on key planning and foundational steps. Notable objectives include undertaking feasibility works around renewable energy solutions, creating governance models and regulatory frameworks, and building the institutional capacity to manage and operate mini-grids. The Ghanaian government and donors stressed the importance of designing scalable and replicable models with greater attention to governance, financial and technical mechanisms that could foster sustainable operation.

Despite these objectives, this phase was characterised by divergent positions on governance and the ownership of mini-grids, which contributed to slowing down

implementation. While donors advocated governance and operational models with substantial private-sector participation, the Ghanaian government insisted on greater state control and ownership to align with its broader approach to energy provision in the country. These different positions generated initial friction that would impact later phases of mini-grid implementation.

### **Design of the GEDAP renewable energy mini-grid component**

In 2007, GEDAP gained approval, backed by the World Bank, the Global Environment Facility (GEF) and other donors. The project aimed to enhance distribution efficiency by bolstering the capabilities of government entities while also expanding access to electricity within an overall approach relying on grid extension but with renewables playing supplementary roles. Within the GEDAP framework, the World Bank encouraged the incorporation of plans to establish mini-grids utilising small-scale renewable energy solutions (World Bank, 2007). Generally, implementation of the component on renewable energy mini-grids was marred by delays. Under component C, two RE approaches to Solar Home Systems (SHS and mini-grids) were introduced during the design phase of the GEDAP programme. Firstly, this was intended to establish new, decentralised mini-grids to supply communities and groups of customers located distantly from existing networks, with a target of 20,000 connections (World Bank 2007:12). Secondly, the aim was to provide 10,000 homes in rural areas with solar photovoltaic (PV) lanterns and lighting systems. However, it was the PV lanterns and systems that were implemented first in what has been seen as an example of patronage politics in which the distribution of solar panels was used to mobilise potential voters (Brass et al., 2019).

Meanwhile, the implementation of mini-grids received only peripheral attention in favour of SHS and suffered a delay in implementation until 2015, when five pilot mini-grids were introduced in the Volta Lake Island communities. The delay in the deployment of renewable energy mini-grids can be attributed to a confluence of factors, including political considerations, divergent views with the World Bank and the lack of a comprehensive renewable energy law, which was identified as a major impediment to the integration of renewables into Ghana's energy mix (Pedersen, 2021). As such, government officials and donors both agreed that the cornerstone of the future and fast promotion of renewables, including the development of mini-grids, is to have a renewable energy (RE) law in place.

Following some efforts by some local officials and donors, processes were initiated to develop an RE Act which was subsequently passed into law in 2011 by Ghana's parliament. However, it is important to note that, even before the passage of the RE Act, the mentioned distribution of solar PV systems by the government had commenced. While the RE Act was passed in 2011, the government had earlier begun SHS distribution and installation in some parts of the country. Between 2009 and 2012, a European government grant of €300,000 was focused on distributing solar panels to rural communities, a project implemented by the Ministry of Energy (MoE) (Brass et al., 2019).

### **Disagreement over control delays implementation**

The disagreement between the Government of Ghana and the World Bank revolved around the design and control of the implementing agency and thus control over resources. From the outset, one aspect of the GEDAP project was the idea of establishing an agency to focus mainly on all RE projects, including mini-grids (World

Bank, 2007). With a considerable degree of autonomy, the Rural Energy Agency (REA) was envisaged as functioning as the primary focal point for Ghana's rural electrification initiatives. Additionally, it would engage directly with donors on transnational sponsored rural RE projects in the country.

During the discussions between the government's officials and the World Bank's staff, the latter presented examples of successful REAs in other countries, including Zimbabwe, Mali and Senegal, as models for replication in Ghana.<sup>1</sup> Highlighting the success of REAs in other countries was not only essential to stimulate alternative views on energy access and rural electrification, but also to impress Ghanaian energy policy-makers about the potential advantages of charting that path. This proposal was vehemently opposed by the government, particularly the Minister of Energy at the time. One key informant recounted a meeting where the minister voiced strong objections:

The minister said, we are already doing our rural electrification scheme. We already have plans to achieve universal access by 2020. So to have a separate agency called REA to look at rural electrification will be a duplication. You cannot have a separate agency and push all the funding through that agency and make it look like an independent authority on its own. Since it is RE you want for rural electrification, the government has a rural electrification unit housed within the ministry. Channel all funding and technical support to that unit rather than a separate authority with the autonomy to deal directly with donors. So in the interim, our decision is that whatever money you the World Bank have, give [it] to us to establish a renewable energy directorate, and this directorate will lead renewable energy projects. (Government Official 2, 20<sup>th</sup> July 2024)

Additionally, senior bureaucrats within the ministry echoed the minister's position during technical discussions with the World Bank, indicating some consensus among political elites and bureaucrats regarding ideas to create an REA. Donors had a deeper realisation that this stance was deeply entrenched and enjoyed a wider consensus between political elites and bureaucrats, which proved the process to be complex, requiring some concessions. Consequently, the idea of establishing an independent REA was abandoned (World Bank, 2010). Nonetheless, it was incorporated into the Renewable Energy Act of 2011, which provides for the establishment of a Renewable Energy Authority (Obeng-Darko, 2018). However, the Renewable Energy Authority was never established, and the RE Act 2011 further highlights that, until an RE Authority is established, an RE unit within the Ministry of Energy will oversee all RE-related projects and initiatives.<sup>2</sup>

Another attempt by the World Bank to wrest control from the government was its proposal in the early phase to appoint an external technical consultant to lead the project's design, a proposal resisted by the Ghanaian team, spearheaded by the Ministry of Energy's Director of RE and the GEDAP Coordinator. The Minister of Energy, leveraging his engineering expertise and substantial political backing from the presidency on

<sup>1</sup> For example, since the establishment of the Rural Electrification Agency (Agence Malienne pour le Développement de l'Énergie Domestique et l'Électrification Rurale, AMADER) in 2003 and the adoption of a public-private partnership model for mini-grids in 2013, Mali had over 190 operational mini-grids (Victor, 2021). Similarly, Zimbabwe's REA has built and operated more than 400 mini-grids (Victor, 2021).

<sup>2</sup> The amended RE Act of 2020 reaffirms that all RE projects will remain under the purview of the RE unit within the Ministry of Energy until the creation of an RE Authority. While the concept of establishing a Renewable Energy (RE) Authority is still enshrined in legislation, there are currently no concrete plans to actualise it in the near future. As indicated by interviewees, there is a notable absence of any strong commitment at the state level to pursue this initiative.



energy matters, strongly advocated that the Ministry of Energy take charge of the project's design. The Minister emphasised the Ministry's robust pool of technical expertise as a key justification for this position. This added significant weight to the argument for a locally led approach. After a series of back-and-forth between the government and the World Bank, the latter succumbed to the former's suggestion to have the project led and designed by engineers at the Ministry of Energy (Interview with government official, 26 July, 2024).

## **PHASE 2. POLICY-MAKING DURING IMPLEMENTATION (2013-2019)**

The period from 2013 to 2019 marked a shift from design to active implementation. During this period, some policy adjustments were made. The Ghanaian government had made its position known to donors on pursuing a public-led model, but discussions continued during the design phase. When the project to construct the mini-grids started in 2014, there was no official or formal policy on mini-grids in the country regarding which business model to deploy.

TTA, a private company, won the bid to construct and operate the mini-grids for two years and thereafter hand over the plants to the Volta River Authority (VRA), a public utility and the biggest generator and supplier of electricity in Ghana. However, the government continued to have concerns about energy tariffs for consumers of electricity from the private mini-grids. The TTA had barely completed its two years of operations when in 2019 the government formally announced its policy position, declaring that the public-led model would be pursued for future mini-grids in Ghana.

### **Agreement and moves towards implementation**

Between 2013 and 2014, the Ministry of Energy expressed its readiness to make an official request to the World Bank for funding to construct five pilot mini-grids around Lake Volta. The construction of these mini-grids started during the peak of load shedding in the country. The inclusion of mini-grids in the country's energy portfolio was considered as part of plans to diversify the energy sources premised on the commitment and preparedness of donors to fund such projects (Interview with official of Ministry of Energy, 20<sup>th</sup> September, 2024). With some in-house technical assistants at the Ministry of Energy, the RE Directorate began a mapping-out exercise. Over 200 islands and more than 2000 communities in 23 districts along Lake Volta that could not be immediately connected to the national grid by 2020 were identified. These comprised 13 downstream communities and 187 upstream of Lake Volta (interview with official of Ministry of Energy, 20<sup>th</sup> September, 2024). These Lake Volta communities were hard to reach with the main grid and therefore require decentralised electrification options in the form of stand-alone and mini-grid systems.

The selection of sites for mini-grids, while influenced by poverty considerations, was also shaped by political incentives. Historically, the construction of the Akosombo Dam within the Volta land communities had a significant impact, displacing many communities and submerging large tracts of fertile lands, which were critical to the livelihoods of the affected populations (Darko et al., 2019; Brass et al., 2019). Thus, as some interviewees hinted, one key consideration that guided the selection of island communities as the initial recipients of government-owned mini-grids were the substantial sacrifices involved in releasing their lands, their loss of livelihoods etc.

However, interviews with key informants show that political incentives were equally important for the selection of communities.

Successive governments had made promises to compensate the communities for their sacrifices. Frustrated by years of neglect, the communities staged protests at different times, even threatening to vote against incumbent governments (Tsikata, 2006). For example, a local pressure group, Forest Green, had repeatedly demanded compensation for the use of their lands for the dam. In 2010, the group petitioned the late President Atta Mills for a special fund to be created for the Volta Island communities (Daily Guide, 2012). The group expressed grievances over years of neglect by successive governments and the VRA. One of the organisers of such protests in Pediatokorpe recalled:

The politicians quickly called. We were receiving calls from all angles. At the time, it was the Minister of State who was an MP and our DCE here; they called us. They asked our group to be calm. He (MP) said that there would be a project for the islands, and we would get our share soon. He had to come here to meet us and promised that if by the next elections nothing is done, we can hold him to his words. (Member of Energy Committee, Pediatokorpe, 26th August 2024)

One issue that generated significant attention revolved around the selection of an entity to spearhead the Engineering, Procurement and Construction (EPC) aspect of the project. From the very outset of the GEDAP project, as evidenced in the 2007 project documents, the developers of mini-grids were expected to be local entrepreneurs or community-based organisations. However, it became clear that local Ghanaian firms lacked the capacity and to some extent the interest in rural mini-grids. The government suggested utilising the country's procurement procedures, employing methods such as sole sourcing and competitive bidding, to appoint a suitable company for the EPC responsibilities (interview with energy expert, 10 June 2024). The rationale behind this insistence was to foster greater national ownership, institute robust monitoring mechanisms and mitigate implementation setbacks.

While the World Bank did not oppose the government's inclination to use domestic procurement processes, it offered recommendations suggesting companies with proven track records in successful EPC undertakings in other countries. These included countries where Ghana had gleaned valuable insights during World Bank-sponsored study tours. Furthermore, the World Bank advocated the consideration of an international competitive bidding process to align with global best practices, especially given the project's international funding status. In practice, this meant that foreign companies with previous experience would have an advantage. Subsequently, TTA, a global consulting and engineering company with headquarters in Barcelona, won the bid and was hired by the Ministry of Energy to undertake EPC for the GEDAP mini-grids. Additionally, in the review process, and as part of the arrangement between the government and the World Bank, final approval of the selection of the EPC contractor and the design of the project was done by the latter (Amuzu-Sefordzi, 2020).

#### **Implementation delays amidst disagreements over ownership**

The GEDAP mini-grids officially began operations in 2017. However, while the GEDAP project was finally moving towards implementation, renewed tensions arose over the ownership of the mini-grids. From the outset, donors had aimed at getting the private sector involved. Internally, there were divisions within the government. The Energy

Commission, which serves as the country's regulatory authority and had been key in drafting the Strategic National Energy Plan 2006 – 2020 (see box above), had long been supportive of private-sector participation in the mini-grid sector (Appiah, 2018). Private-sector participation also played a part, being highlighted in the discussions on business models for mini-grids at learning events and on study tours to Kenya, Sri Lanka and Myanmar in 2013-15. Key in these discussions was the collaboration between the World Bank Technical Group on GEDAP and the government of Ghana led by the Director of Renewable Energy (Ministry of Energy) and other senior bureaucrats as Ghana's representatives.

However, in the end, at the design stage of the GEDAP mini-grids, officials in the Ministry of Energy came to take a different position, as they disagreed with donor officials on what business model was best suited for mini-grids in the country. While donors advocated the adoption of a private business model, the key government officials thus insisted on a public-led model. Energy tariffs gradually emerged as a contentious issue. This had to do with experiences with the first private mini-grids, among these Black Star Energy (more in the next section), which had been developed on a commercial basis and had taken over GEDAP's mini-grids. To recover their costs, private mini-grid operators charged higher tariffs than those charged by the main grid (Bukari et al., 2021). This was controversial in Ghana, which has a Public Utilities Regulatory Commission (PURC) to regulate tariffs, but also a long tradition of political interference in tariff-setting.

Most importantly, historically the state has been responsible for providing access to electricity and subsidising the power consumption of low-income families, including the life-line tariff, a subsidised pricing rate (Ackah et al., 2021; Foster and Pushak, 2011). Justifying the need for a public-led model, senior bureaucrats working on the GEDAP project and having the trust and support of the political leadership argued that, not only would a private business model impose high tariffs on consumers, who are the rural poor, but it would also have the tendency to create potential tensions between grid and off-grid consumers with wide political and social implications. As one respondent noted:

We don't want to have that social unrest because when these private guys start taking higher tariffs, the people will agitate like it happened with Black Star Energy in the Ashanti region, and we had to step in and get it shut down. So for us at the ministry, the public-led model was best to avoid all [this] likely unrest which the government is aware of and the consequences it can bring.  
(Government Official, May 2024).

The conflicts over ownership resulted in a prolonged period of negotiations and power struggles between donors and the MoE. Consequently, in 2015, some concessions were arrived at, resulting in the agreements to transfer the management of the mini-grids to state utilities. Under this agreement, any mini-grid located within the jurisdiction of state utilities (i.e., ECG or NEDCo) would be managed by the respective state utility (interview with government official 4 July 2024). Specifically, the Volta River Authority (VRA) was tasked with overseeing the management of five mini-grids serving communities on Volta Island.

The idea of private-sector participation in the management of mini-grids was accepted by the government only to the extent that it allowed the TTA to operate the mini-grids for two years. During this period, the TTA was to provide training to VRA staff to equip them with the skills required for managing mini-grids and allow them to take up this

responsibility. Both the sector ministry (Ministry of Energy) and the implementing agency, the VRA, which was given the responsibility for the project, lacked expertise in mini-grid operation and management at the time it started.

For the donors, this arrangement was a strategic move to demonstrate that private-sector management could be as effective as public-sector control. They hoped that after two years of private management, starting in 2017, they would have enough evidence to persuade the government to adopt private management for mini-grids in the long term. However, the Ministry of Energy (MoE) pre-empted this plan, announcing before the two-year period had even elapsed that mini-grids would remain state-controlled.

### **PHASE 3. 2019–REVERSAL AND RECONFIGURATION OF THE APPROACH TO RENEWABLE ENERGY MINI-GRIDS**

From 2019 onwards a reconfiguration of governance approaches and a major influx of new funding were witnessed. The government's announcement of a public-led model for mini-grid management established a formal policy position that profoundly impacted the policy environment for both public and private actors in the sector. This policy position of the government's not only reinforced its insistence on having control in the management of the mini-grids, it also had implications for the nature of private-sector participation. Black Star Energy, a private company which had successfully built and managed fifteen mini-grids in parts of the Ashanti and Brong Ahafo (now Ahafo) regions, was compelled to close its operations, underscoring the overall implications of the announced public-led directive. A notable development emerged during this period: the limited interest of state utilities, such as the Volta River Authority (VRA), which were primarily expected to take a leading role in managing mini-grids henceforward.

The VRA showed limited interest in managing mini-grids due to concerns over their financial viability and the operational challenges of managing decentralised, small-scale energy systems. Operating these small energy systems in rural and remote areas often requires substantial subsidies and maintenance, raising critical concerns about their economic viability and long-term sustainability. Despite the VRA's apparent lack of interest, the Ministry proceeded with efforts to consolidate mini-grid management under public entities, aligning with its policy stance on public-led rural electrification. Another crucial development during this phase was the AfDB's commitment to fund 35 new mini-grids under the Scaling Up Renewable Energy Programme (SREP). This funding underscored AfDB's support of Ghana's public-led model in complete departure from the private-sector model advocated by other donors, notably the World Bank.

#### **Complete reversal on private renewable energy mini-grids and implications for Black Star Energy**

GEDAP mini-grids were preceded by Black Star Energy (BSE), a private company and a subsidiary of EnergyCity Company based in the United States of America. Before moving to Ghana as BSE, the EnergyCity Company had a successful track record of operating mini-grids and renewable energy projects in other countries, mainly in Asia and the Caribbean (interview with private-sector energy company, 31 July 2024). Between 2015 and 2018, BSE had developed, owned and operated fifteen mini-grids primarily in the Ashanti and Ahafo Regions with plans to upscale to other parts of the country (Bukari et al., 2021).

Prior to the government's policy shift in 2019, therefore, the mini-grid sector in Ghana had a more diverse ownership structure, which allowed private companies to contribute significantly to expanding energy access in remote areas. This was mainly due to the support from the Ghana Energy Commission for the private sector, which in turn explains how BSE began mini-grid operations in the country. Indeed, at the time BSE began its operations, there was no policy guiding the operation of mini-grids in Ghana. The Energy Commission, motivated by strong private-sector interest in mini-grids, provided a license for BSE to commence operations. BSE's mini-grid business model was different from GEDAP. Not only was it a private entity, it was also mainly self-sustaining, relying on user fees to fund operations and investment in infrastructure, thus allowing them to continue without governmental subsidies. BSE's success story in providing reliable electricity services bolstered the case that the private sector would significantly accelerate energy provision for rural communities while reducing the government's financial and operational constraints.

However, in 2019, the government's policy announcement of a public-led model for mini-grids basically changed the operating environment. This implied that the mini-grid market has been formally shut to BSE and other potential private developers. The pace of mini-grid development in the country suffered significant setbacks due to the unfavourable policy for private-sector investment. One crucial argument advanced by supporters of a public-led model has to do with affordability issues, namely that rural dwellers are predominantly poor. Thus, decentralised energy solutions like mini-grids, when placed in the hands of profit-driven, private-sector operators, will not take affordability into consideration. In particular, it is argued that energy is a service that the state needs to ensure is made accessible and affordable to all, irrespective of one's location.

Ghana's history of energy subsidies often sets tariffs in a manner that prioritises short-term political gains over long-term fiscal sustainability. This practice is often driven by the government's desire to appease voters even at the expense of the fiscal health of state utilities (Dye, 2023). Undoubtedly, a cost-reflective tariff would allow a fair degree of sustainability of mini-grids in terms of meeting operational costs such as the payment of salaries to administrators and, electricians, the replacement of batteries etc.

The continuous approach of the public-led model to avoid cost-reflective tariffs, which also applies to grid-connected cases, is primarily a response to the associated social and political consequences. It is therefore unsurprising that PWC's socio-economic analysis report was abandoned in favour of continuous subsidisation (PWC KITE, 2012). Allowing a cost-reflective tariff would remove the government's ability to vary tariffs set by the PURC, which was intended to function as an independent body under the Standard Reform Model.

### **VRA's disinterest and the Ministry of Energy's reliance on state utilities for the management and operation of mini-grids**

As noted in previous sections, there were divisions within the government with regard to the mini-grid business model, divisions that continue to affect the deployment and operation of mini-grids to this day. Though the VRA had long been exploring ways of electrifying island and lakeside communities, the state utility viewed the mini-grids it was going to take over from the TTA more as the Ministry's project than its own. The adoption of a top-down decision-making approach meant that the VRA had very little input during

the policy design and formulation stage. Recounting how the VRA was incorporated into the decision-making process, an insider had this to say:

VRA can't be bothered with these systems, and that's a fact. They were forced to take them on board. They were not really interested in these mini-grids. Unless they just take them as those CSRs and not something they the utilities are interested in. These are not really business systems that bring them money, and most of the engineers of these utilities are not RE experts. I knew from day one that building and leaving these systems for them were likely going to create sustainability problems for the future of mini-grids. (Energy Expert, July 22 2024)

Interviews with VRA officials and other observers confirm that mini-grids are not being treated as part of the core business of the state utility. As one interviewee put it, "these mini-grids didn't emanate from us: it wasn't part of our plans. It was the Ministry that took them and decided to hand them over to us to manage. It is like your father asking you to take care of his new child. He says you should do it whether you are interested or not. Can you say no? We have to accept it". (VRA official, September 18, 2024). Project administrators and VRA officials indicated that revenue generation is minimal, with monthly collections ranging between 400 and 800 cedis after payment of project administrators and electricians.

A major reason for the lack of VRA interest has to do with unrealistic tariffs. The revenue generation explains why it took a whole year (June 2023 to July 2024) to replace worn-out batteries after less than a decade of operation. During this period, residents had no electricity due to the absence of functional batteries. According to VRA officials, their role was limited to managing the project. Replacing batteries, estimated to cost over 80,000 dollars, was the responsibility of the Ministry because they were only tasked to manage it on behalf of the former. Eventually, the MoE had to seek funding from donors to be able to replace worn-out batteries, the VRA being pressed by the former to support 20% of the cost.

Without a sufficient and careful understanding of the implications of applying a tariff regime similar to the main grids, the sustainability of the mini-grid operation will have adverse financial impacts on the VRA. Nonetheless, and contrary to initial fears, the push for mini-grids for these communities has not only been maintained but intensified. Under the SREP, plans now include constructing 55 mini-grids, with 35 AfDB-funded mini-grids currently under construction and three new SECO-funded mini-grids fully constructed, all placed under the control of the VRA (interview with government official, 18 September 2024).

## **DISCUSSION**

This study has analysed the evolving governance of mini-grids in Ghana, highlighting the interplay between policy shifts, political dynamics and the actors immersed in the respective processes. It has mapped the evolution of mini-grids from their preliminary design phase (2007-2013), through the policy modifications enacted during active implementation (2013-2019), to the subsequent reconfiguration and consolidation under a public-led model post-2019. By unpacking how these processes and disagreements have slowed mini-grid implementation in Ghana, the paper contributes to the literature on mini-grids in sub-Saharan Africa. It argues that mini-grid development has been slow and uneven due to a misalignment of interests and ideas between the

government of Ghana and donors led by the World Bank over the governance and ownership models. Whilst the government has increasingly favoured a public-led model to increase its control over rural electrification, this often faced disapproval from early key donors, who favoured a private-led model.

The government's shift in position was affected by internal political dynamics. Scholars broadly agree that Ghana's political settlement is characterised by competitive clientelism, which caters for short-term decision-making, as political elites risk losing power if they do not maximise immediate gains and ensure electoral support (Abdulai, 2021; Hirvi and Whitfield, 2015). In the energy sector, one consequence of Ghana's competitive clientelism has been the challenge of undertaking lasting reforms, especially regarding unbundling the sector in a way that provides increased private-sector participation. This is more the case for the distribution of electricity, including for the mini-grid and rural electrification segments, than it is for large-scale production, which has seen the significant involvement of private independent power producers (IPP).

It is instructive to stress that, although the idea of doing mini-grids was a component of the 2007 GEDAP document, it did not attract greater attention until the construction of the five island mini-grids, which furthermore were much delayed. This was partly because the focus of the country has always been on increasing access through extending the main grid. For both political elites and technical persons at the Ministry of Energy, "real access" is mainly achievable via grid connection.

Similarly, for renewable mini-grids, governments have increasingly tended to pursue policies in ways that reinforce state control rather than prioritise efficiency and competition. At the national level, there is a broad consensus among successive governments that mini-grids should be managed under a public-led model. This may come as a surprise as the two parties have different ideological orientations, with the NPP professing a right-of-centre ideology and the NDC pursuing a left-of-centre orientation with a commitment to distributive justice. However, as Whitfield (2018) notes, ideological differences between the self-professed centre-right NPP and the centre-left NDC are primarily rhetorical and mainly used to rally their bases. These ideological differences have little influence on actual policy-making, both adoption and implementation.

Aware that narrow margins often determine the outcome of elections between winner and loser during elections, and given the critical role electricity provision plays in Ghana's politics, no party would ever risk dismantling an intervention like mini-grids, which have become increasingly important energy initiatives for rural communities. This aligns with Dye's (2022: 9) observation about Ghana's energy landscape: "Electricity's important status gives it added significance in the highly competitive political system in which governments simply can't afford to anger voters or fail to meet their expectations". Or, as one government official interviewed for this paper put it, when it comes to electricity in Ghana, ideology doesn't matter (interview with energy expert, 28 June 2024).

At the local level, Ghana thus has a long story of using electrification for patronage politics, where energy infrastructure is exploited for political advantage, as well as to maintain control over decision-making, which has implications for securing the support of rural voters. We saw this when it came to site selection in the GEDAP project, where

decisions about where to locate some of the mini-grids reflected political and electoral considerations. Local politicians, including some MPs and DCEs, made attempts to influence the selection by instructing project implementers to start erecting poles in certain communities against earlier earmarked areas for the project. By commencing the mini-grid project in a politically favourable community(s), political elites sought to demonstrate their capacity to provide developmental rewards to their constituents, hence enhancing their electoral prospects. Moreover, we can also see this in the slow implementation and rollout of mini-grids, which is significantly influenced by communities' preference for grid connection. This is deeply embedded in the notion that the traditional grid offers superior and more reliable energy than mini-grids.

In 2019, the Ministry of Energy (MoE) issued a policy statement reinforcing a public-led model for mini-grids, signalling that the government of Ghana had clearly shifted away from private-sector participation in this electricity sub-sector. This was particularly surprising under an NPP government which professes to support private-sector-led growth in all aspects of the Ghanaian economy. The move of the management of mini-grids to state utilities was met with mixed reactions, revealing underlying disagreements among government organisations that can be observed throughout the period under investigation in this paper. For example, the VRA, which was tasked by the MoE to manage mini-grids under GEDAP, showed a lack of interest.

Studies in other countries concur with this observation, highlighting how the big utilities show little interest in mini-grids because of a lack of profitability (See: Franz et al., 2014; Tenenbaum et al., 2014). This disinterest stemmed mainly from the financial unviability and long-term sustainability concerns of mini-grids in relation to VRA operations. However, as a result of electricity politics in Ghana's rural electrification initiatives, state utilities are often ignored in policymaking, which has wide political outcomes. As some studies have highlighted, these dynamics are underpinned by the broader politics of rural electrification (Sackeyfio et al., 2018; Nuru et al., 2022). Evidently, the implementation of the GEDAP mini-grids has been seen purely as an additional burden with limited economic impact on VRA operations.

On the international level, the analysis thus highlights how Ghana's mini-grid sector has been influenced by internal political dynamics as well as external donor influences. Focusing mainly on the GEDAP mini-grids, the paper provides evidence to buttress the point that characterising mini-grids as shaped purely by domestic political dynamics or externally driven by donors discounts the interconnected and mutually reinforcing nature of these two factors. In the early years, and unlike many of Ghana's rural electrification programmes, which are often driven by political and electoral incentives or local community pressures (Cuesta-Fernandes, 2018; Sackeyfio et al., 2018), the adoption of mini-grids was not initially decided by these dynamics. Instead, the underlying triggers of their adoption were based on the efforts of donors, particularly the World Bank, employing various strategies, including funding and study tours. These efforts laid the groundwork for their adoption and subsequent implementation.

## **CONCLUSION**

This study sheds insights on the key factors that have shaped development in Ghana's mini-grid sector over the years. Evidence from the study suggests that the extent to which donor pressures or interests shaped the rollout of mini-grids depended on how



closely this was aligned with the interests of domestic actors within the political settlements. It is commonly held that funding could be used as leverage to push for a specific approach to mini-grids such as the adoption of a private sector-led business model in line with efficient sustainable energy reforms. However, this was not the case with the donor-sponsored GEDAP mini-grids. Despite strong advocacy and a push from donors for the adoption of a private-sector model, this was fiercely resisted by domestic elites.

The evidence suggests that domestic political elites were aware of the successful operations of BSE, a private company in the Ashanti and Bono regions that had installed fifteen mini-grids around the same time the GEDAP mini-grids were launched. These successful BSE mini-grids had previously been cited as justification for a private sector-led model. Although the government partially agreed to have private-sector participation, this was limited to only an EPC and a two-year management and operation phase of the mini-grids by the TTA. Even with this partial private-sector involvement, the MoE hurriedly announced a mini-grid policy for the country, emphasising a public-led approach. This effectively dismissed any potential push for consideration of a private-sector model.

By implication, BSE operations, which were receiving endorsement at the level of both the donors and local communities had to end abruptly given the MoE's announcement of a public-led mini-grid policy. The influence of political settlements played a role during implementation, particularly when the idea of establishing a Rural Electrification Authority (REA) as part of the broader donor strategy to oversee rural electrification projects, including mini-grids, was mooted. This idea was strongly resisted by the MoE primarily because of the political need to maintain control over rural electrification, which remains an essential tool for securing rural votes.

This study has shown that the uneven and slow deployment of mini-grids in Ghana is primarily a result of the misalignment of interests and ideas between the government and its donors, particularly regarding governance and ownership models. Furthermore, the analysis underscores how Ghana's highly competitive political settlements dynamics have shaped short-term decision-making that prioritises visible projects with immediate electoral gain over energy reforms and plans that take a longer time to bear fruit. This has resulted in a strong preference for grid extensions and energy subsidies, which, although politically appealing, often hinder mini-grid development, with overall implications for efforts to achieve the energy transition. In addition, institutional conflicts driven by power play and overlapping mandates between or among key state agencies tend to hinder coherent mini-grid governance.

Although the primary focus of the study is on mini-grid deployment in Ghana, its findings provide wider insights into understanding the politics of energy development in developing countries. The Ghanaian case illustrates how energy policy transcends mere technical or economic considerations. Instead, it is deeply political, i.e. is shaped by institutional power struggles, electoral incentives and competing interests and ideas between governments and external actors. This underscores the need for energy governance frameworks that do not ignore or overlook informal relationships but explore ways of harnessing and integrating them more effectively. In essence, policies that leverage informal relationships more strategically can help build a coalition of support for energy transitions, making reforms not only successful but also more sustainable in the long term.

## REFERENCES

- Abdulai, A.-G. (2018). The political economy of maternal healthcare in Ghana. ESID Working Paper No. 107. Manchester, UK: The University of Manchester
- Abdulai, A. G. (2021). Competitive clientelism, donors and the politics of social protection uptake in Ghana. *Critical Social Policy*, 41(2), 270-293.
- Abdulai, A. G., & Appiah, D. (2023). The politics of public financial management in Ghana: what can a political settlements approach offer? *Journal of African Political Economy and Development*, 8(1), 1-14.
- Abdulai, A. G., & Mohan, G. (2019). The politics of bureaucratic 'pockets of effectiveness': Insights from Ghana's Ministry of Finance. ESID Working Paper No. 19.
- Ackah, I., Bukari, D., & Suleman, S. (2020). Ghana's transition to renewable energy mini-grids: An assessment of ownership, management and performance dynamics. *International Journal of Strategic Energy and Environmental Planning*, 2(3), 24-42.
- Ahlborg, H. (2018). Changing energy geographies: The political effects of a small-scale electrification project. *Geoforum*, 97, 268-280.
- Amankwah-Amoah, J., & Sarpong, D. (2016). Historical pathways to a green economy: the evolution and scaling-up of solar PV in Ghana, 1980–2010. *Technological Forecasting and Social Change*, 102, 90-101.
- Amuzu-Sefordzi, B. (2020). Implementing Renewable Energy Projects in Ghana: Perspectives from Inclusive Innovation and Intermediation. (Doctoral Dissertation, University of Western Australia).
- Appiah, F. K. (2018) Regulations on Mini Grids. Energy Commission, Ghana. Accra International Conference Centre (10 October 2018).
- Asante, K. Abdulai, A-G. & Mohan, G. (2021). The 'new' institutional politics of Ghana's hydrocarbon governance. ESID Working Paper No. 169.
- Ayanoore, I. (2018). *Oil governance in Ghana: Exploring the politics of elite commitment to local participation*. The University of Manchester (United Kingdom).
- Baker, L., Sesan, T; Bhattacharyya, S; Pueyo, A, et al. (2022). Of monopolies and mini grids: case studies from Kenya, Tanzania, Nigeria, and Senegal. University of Sussex. Journal contribution.
- Behuria, P., Buur, L., & Gray, H. (2017). Studying political settlements in Africa. *African Affairs*, 116(464), 508-525.
- Brass, J. N., Schon, J., Baldwin, E., & MacLean, L. M. (2020). Spatial analysis of bureaucrats' attempts to resist political capture in a developing democracy: The distribution of solar panels in Ghana. *Political Geography*, 76, 102087.
- Bukari, D., Kemausuor, F., Quansah, D. A., & Adaramola, M. S. (2021). Towards accelerating the deployment of decentralised renewable energy mini-grids in Ghana: Review and analysis of barriers. *Renewable and Sustainable Energy Reviews*, 135, 110408.

Christiaensen, L., & Heltberg, R. (2014). Greening China's rural energy: new insights on the potential of smallholder biogas. *Environment and Development Economics*, 19(1), 8-29. Collier, D. (2011). Understanding process tracing. *PS: Political Science & Politics*, 44, 823-830.

Cuesta-Fernandez, Ivan (2018), *Kilowatts, megawatts and power: electric territorialities of the state in the peripheries of Ghana and Tanzania*, Edinburgh: University of Edinburgh.

Darko, D., Kpessa-Whyte, M., Obuobie, E., Siakwah, P., Torto, O., & Tsikata, D. (2019). The context and politics of decision making on large dams in Ghana: an overview.

Dye, B. J. (2023). When the means become the ends: Ghana's 'good governance' electricity reform overwhelmed by the politics of power crises. *New Political Economy*, 28(1), 91-111.

Energy Commission (2012). 2012 Energy (Supply and Demand) Outlook For Ghana, Accra: Ghana Energy Commission.

Foster, V., & Pushak, N. (2011). Ghana's infrastructure: A continental perspective. *World Bank Policy Research Working Paper*, (5600).

Francis, K., Dongying, S., Dennis, A., Edmund, N. N. K., & Kumah, N. Y. G. (2022). Network governance and renewable energy transition in sub-Saharan Africa: contextual evidence from Ghana. *Energy for Sustainable Development*, 69, 202-210.

Franz, M., Hayek, N., Peterschmidt, N., Rohrer, M., Kondev, B., Adib, R., ... & Mangwengwende, S. E. (2014). Mini-grid Policy Tool-kit. Policy and business frameworks for successful mini-grid roll-outs. Africa-EU Renewable Energy Cooperation Programme (RECP), European Union Energy Initiative Partnership Dialogue Facility (EUEI PDF).

Gyimah-Boadi, E. (2010). *Towards a Constitution for a Democratic and Well-governed Ghana*, Ghana Center for Democratic Development (CDD-Ghana).

Ha, Y. H., & Kumar, S. S. (2021). Investigating decentralized renewable energy systems under different governance approaches in Nepal and Indonesia: How does governance fail? *Energy Research & Social Science*, 80, 102214.

Hirvi, M., & Whitfield, L. (2015). Public-service provision in clientelist political settlements: Lessons from Ghana's urban water sector. *Development Policy Review*, 33(2), 135-158.

Hyde, P. D. (2010). *Exploring Ghana's experiences with biogas as an alternative energy source* (Master's Dissertation, University of Oslo).

Ibrahim, M. (2023). From policy to politics? Exploring feedback effects of social protection on state-citizen relations in Ghana. *Social Policy & Administration*, 57(6), 902-918.

IEA. (2022). SDG7: data and projections: access to affordable, reliable, sustainable, and modern Energy for all. <https://www.iea.org/reports/sdg7-data-and-projections/access-to-electricity>

IRENA (2015). Ghana Renewables Readiness Assessment. International Renewable Energy Agency (IRENA)

Johnson, L., Hannah S., Austin S., James H., Clara Y., Emily A., Ximena P., and Ricky, P. (2020). A Multi-Perspective Analysis of Renewable Energy Technologies in Sub-Saharan Africa: A Ghana Case Study, Washington: University of Washington

- Kelsall, T. (2018). Towards a universal political settlement concept: A response to Mushtaq Khan. *African Affairs*, 117(469), 656-669.
- Kemausour, F., Adjei, K. A., Dramani, J. B., Frimpong, P. B. (2020). The Costs And Benefits Of Electrifying Rural Ghana. Ghana Priorities, Copenhagen Consensus Center, 2020. License: Creative Commons Attribution CC BY 4.0.
- Khan, M. (2010) *Political Settlements and the Governance of Growth Enhancing Institutions*. London: SOAS.
- Killick, T. (2010) *Development Economics in Action: A Study of Economic Policies in Ghana*. Second Edition London: Routledge.
- Korzhenevych, A., & Owusu, C. K. (2021). Renewable minigrid electrification in off-grid rural Ghana: exploring households' willingness to pay. *Sustainability*, 13(21), 11711.
- Lavers, T., & Hickey, S. (2016). Conceptualising the politics of social protection expansion in Low-income countries: The intersection of transnational ideas and domestic politics. *International Journal of Social Welfare*, 25(4), 388-398.
- Nuru, J. T., Rhoades, J. L., & Gruber, J. S. (2021). Evidence of adaptation, mitigation, and development co-benefits of solar mini-grids in rural Ghana. *Energy and Climate Change*, 2, 100024.
- Nyasapoh, M. A., Debrah, S. K., Anku, N. E., & Yamoah, S. (2022). Estimation of CO2 emissions of fossil-fueled power plants in Ghana: message analytical model. *Journal of Energy*, 2022(1), 5312895.
- Obeng-Darko, D. (2017). Regulation of the Renewable Energy Sector and the Proposed Renewable Energy Authority in Ghana: An Examination. *Renewable Energy Law and Policy Review*, 8(2), 7-21.
- Pedersen, R. H., Ole W. A., and Ilse R. (2021), *The Political Economy of Energy Transitions In Sub-Saharan Africa: Contributions To An Analytical Framework*, Copenhagen: Danish Institute for International Studies.
- Pedersen, R. H. (2022). Towards a Political Economy of Renewable Energy in Ghana: A Review. MIASA Working Paper No. 2022 (4).
- Pwc KITE (2012). Socio-economic study for mini-grid electrification of Island communities in Ghana. Unpublished 2012. PwC/ KITE 2012.
- Sackeyfio, N. (2018). *Energy Politics and Rural Development in Sub-Saharan Africa: The Case of Ghana*, Cham, Switzerland: Palgrave Macmillan.
- Sesan, T., Fajardo, A., Baker, L., Uduka, U., Kausya, M., Kerr, D., ... & Bhattacharyya, S. (2024). Strengthening commercial viability through greater inclusiveness in rural mini-grid deployment: Insights from Nigeria and Kenya. *Energy for Sustainable Development*, 83, 101584.
- Sovacool, B. K. (2018). Success and failure in the political economy of solar electrification: Lessons from World Bank Solar Home System (SHS) projects in Sri Lanka and Indonesia. *Energy Policy*, 123, 482-493.
- Tignor, R. (2006) *W. Arthur Lewis and the Birth of Development Economics*. Princeton: Princeton University Press.

Tsikata, D. (2006). *Living in the shadow of the large dams: long term responses of downstream and lakeside communities of Ghana's Volta River Project* (Vol. 11). Brill.

Tenenbaum, B., Greacen, C., Siyambalapatiya, T., & Knuckles, J. (2014). *From the bottom up: how small power producers and mini-grids can deliver electrification and renewable energy in Africa*. World Bank Publications.

Victor, J. C. (2023). *Expanding Energy Access Through Minigrids in Sub-Saharan Africa Private Sector, Financing Approaches, And Public-Private Models: What Works?* (Doctoral Dissertation, Johns Hopkins University).

Whitfield, L., (2018). *Economies after colonialism: Ghana and the struggle for power*. Cambridge: Cambridge University Press.

World Bank (1989), Staff Appraisal Report. Republic Of Ghana Electricity Corporation Of Ghana. Fifth Power Project, Washington: World Bank.

World Bank (2007). Project Appraisal Document On A Proposed Credit In The Amount Of SDR 59.1 Million (US\$90.0 Million Equivalent) And A Proposed Grant From The Global Environment Facility Trust Fund In The Amount Of US\$5.5 Million To The Republic Of Ghana For An Energy Development And Access Project, online: (Accessed: 20 July 2023).

World Bank (2010). *Project Paper On A Proposed Additional Credit In The Amount Of SDR 46.2 Million (US\$70 Million Equivalent) To The Republic Of Ghana For An Energy Development And Access Project*, online: (Accessed: 13 February 2023).

