National University of Lesotho

Tracing Energy Democracy in Decentralized Mini-Grid Projects in Lesotho: A Life Cycle Approach

PAKI TSOTLEHO

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Abstract

As the Lesotho electricity generation landscape transitions from centralized modes of systems towards decentralized generation and distribution systems, there exists a potential challenge of elite capture in governance structures and frameworks that may overlook the social dimensions that guarantee the sustainability of such systems. This study interrogates the Lesotho decentralized mini-grid energy systems landscape for traces of the energy democracy agenda as a globally sought-after discourse due to its nature to either be a deterrent or a stepping stone for sustainable energy development using an abductive research method. This discourse is especially important for knowledge production that can potentially inform national policy associated with the transition from productive use of energy to sustainable use of energy.

The report starts by scrutinizing the available written work on mini-grids as a whole, legal or otherwise, establishing the broad national perspective of the development of the mini-grids in Lesotho. This is then complemented by assessing existing case studies of Ha Makebe and Motete in rural Lesotho to primarily focus on the role that decentralization plays in elements of energy democracy in mini-grids developments. The research takes on a life-cycle approach as the main analytical framework, under which institutional processes and practices are matched across the four identified phases of the project life-cycle. This is further supported by evaluating the host communities on their status as energy citizens under the energy democracy agenda. The results of this research study demonstrate the status of the policy and legal framework to imply the energy democracy agenda rather than it is inferred. This observed state of policy and legal framework further spills into the formulation approaches on standard governance practices that focus on infrastructure optimization as opposed to project sustainability which speaks to the effectiveness of the institution to govern such developments. Lastly, the results of this study present the host beneficiaries as eager and willing citizens to exercise their collective role as energy citizens to institutionally hold other stakeholders accountable under the energy democracy agenda concerning the development of decentralized mini-grids in Lesotho as to achieve a just and equitable energy transition.

Keywords: Project life cycle, Decentralization, Energy democracy, Energy citizenship, Sustainable development.

Declaration

I, Paki Donald Tsotleho, declare that the works presented in this document are the result of my research and analysis. Any sources of information utilized have been acknowledged and cited.

Date…….

Signature…….

Paki Donald Tsotleho

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CHAPTER 1: Contextual Background

1.1 Introduction

This study aims to interrogate the existing development status of decentralized mini-grid projects in Lesotho by analyzing the impact of the politicization of energy practices and procedures through the discourse of energy democracy (Szulecki and Overland, 2020).
Lesotho's electricity service management, transmission, and distribution have been under government control since the year 1969 via the Lesotho Electricity Corporation (LEC) which was established under the Lesotho Electricity Act. In practice, this central governance by the corporation has created a monopoly in Lesotho's energy system, leaving little room for accountability and public inclusion in its operations (Tsikoane, 2010). It took thirty-three years after the establishment of LEC for the Government of Lesotho to introduce a regulating body in line with the government policy through the Lesotho Electricity Authority (LEA) Act. No. 12 of 2002 as amended. This time lag demonstrates the urgent need for academia to support policy that will enable the implementation of proactive measures in a timely fashion, as a way to contribute to a sustainable energy sector.

In 2022, Lesotho's electrification stood at 52 % while the energy deficiency was at 63 %. (*LEWA Annual Report 2021-22*, 2022; The Reporter, 2022). The following year, Lesotho added to its 72 MW Muela hydropower station power generation, a capacity of 30 MW from the Ramarothole Solar Plant in Mafeteng. When added together, these still do not meet the national maximum demand of 203.48 MW (LENA, 2023; *LEWA Annual Report 2021-22*, 2022; TsoeuNtokoane et al., 2023). The growing consensus in the energy sector of Lesotho is that minigrids offer a prospective alternative to grid extension, as a way to mitigate the existing shortage in electricity supply. However, based on the number of active mini-grid projects, it is safe to say progress is slow in this regard. From 1983 to date, only a handful of energy power plants are in operation in Lesotho. These include the 589 kW at Semonkong, the 540 kW at

Katse, the 52 kW at Motete, a 37 kWp at Linakeng, and a 50 kW at Ha Makebe while the Tsoelike

(400 kW), Tlokoeng (670 kW) and Mants'onyane (2 MW) mini-grids have since ceased to be operational (Klunne, 2013; The Reporter, 2023; Tsoeu-Ntokoane et al., 2023). Based on this information, one can deduce that the development of mini-grid projects as a strategic initiative to electrify the rural areas of Lesotho is in its infancy phase. As a prospective solution for Lesotho's energy supply, there is an urgent need for research to investigate the likely causes of these unsuccessful mini-grid projects and the potential improvement strategies in their institutional approaches.

Lesotho's inaccessibility on account of its mountainous terrain has contributed to the low electrification rate in the rural areas, currently standing at 11.4 percent (United Nations Development Programme, 2023). As a result, the country is making significant efforts to explore the potential benefits of transitioning from centralized energy systems to decentralized renewable energy systems due to its inherent advantages revolving around energy security and quality. As highlighted by the Ministry of Energy and Meteorology in Lesotho and UNDP/GEF, (2019), Lesotho has identified the installation of mini-grids as a sustainable solution to combat the lack of energy access and generation. Mini-grids are defined as energy systems that can operate in isolation from the national electricity transmission network to generate electricity between 10 kW to 2 MW using renewable energy resources which can only be distributed to a limited number of consumers (Ministry of Energy and Meteorology Lesotho and UNDP/GEF, 2019). As we transition to these forms of decentralized energy systems, it is important to put into place mechanisms that will empower and safeguard the interests of the public these systems seek to serve. This study aims to trace the concept of energy democracy as one of the potential mechanisms to employ in order to sufficiently contribute to actualizing the aforementioned goal.

Taele et al., (2007) and AETS Consortium, (2018) state that Lesotho has abundant renewable resources with high potential in hydropower, wind, and solar that can produce a minimum of 450 MW, making this proposed transition a highly beneficial one. These mini-grids accelerate the rural electrification process and reduce energy poverty while also contributing to the development of local economies (Ministry of Energy and Meteorology Lesotho and UNDP/GEF, 2019). Successfully implementing a mini-grid is generally dependent on factors such as; appropriate technology, accessibility to financing, appropriate policy and regulatory design, and the application of relevant and effective business models (Ministry of Energy and Meteorology Lesotho and UNDP/GEF, 2019). Although mini-grids have been identified as sustainable energy solutions in Lesotho, the main challenge is the lack of or the

underdevelopment of the legal and regulatory frameworks that speak directly to the entire life cycle of such systems while democratically representing all involved stakeholders. The underdevelopment of these policies at first glance is perceived as a barrier to the successful deployment and operation of the mini-grid systems in Lesotho. However, at a second glance, this can be seen as an opportunity for research that will help least-developed countries like Lesotho to align and learn from the existing sustainable standard practices in developed countries, by tailoring them to fit the local socio-political context. Research in developing countries shows that sustainable energy policies are more likely to succeed if they fundamentally contribute to the societal development objectives while also aligning with the cultural habits of the community they aim to serve (Ahuja et al., 2009). Szulecki and Overland, (2020) posit that there is a growing need for policymakers and energy sector companies to engage in depth with social aspects that are generally given less priority. This can facilitate and encourage the enrolment and activism of the host citizens in these proposed energy transition development projects. The arguments of this study are based on the notion that to achieve sustainable development, existing technocratic expertise needs to be supplemented by thorough research on the socio-political nature of these proposed decentralized energy projects.

1.2 Research Problem

Lesotho's electricity generation landscape is gradually shifting towards decentralized renewable energy generation and distribution with collective efforts seen from both the private sector in terms of the active participation of independent power producers and the existence of public-private partnerships under the Ministry of Energy and Meteorology initiatives. In the recent publication of LEWA NEWS, (2023), LEWA highlighted that as of December 2023, licenses were granted to OnePower (Pty) Ltd, NEO 1 SPV (Pty) Ltd, Sotho MiniGrids Portfolio SPV (Pty) Ltd and Lesotho Electricity Generation company to operate in concessioned areas. Effective 31st July 2020, the Lesotho government embarked on a seven-year project called the Lesotho Renewable Energy and Energy Access Project (LREEAP) through the Department of Energy and Lesotho Electricity Company funded by the World Bank (Ministry of Energy and Meteorology, 2022). Among its primary development objectives, LREEAP aims to provide electricity to disadvantaged rural communities using mini-grid technology and at the center of its deployment advocates for private sector-led business models. Through this initiative, it can be studied that the government of Lesotho has prioritized a private sector-led business model which poses the potential challenge of elite capture in management systems that may not adequately and sufficiently be sensitive and receptive to the social nuances necessary to ensure the sustainability of mini-grid development in impoverished rural areas (GVEP International, 2011).

This study therefore argues that to achieve a just and equitable private-led energy project, it is important to trace and scrutinize the mini-grid development processes to institutionally position the native citizens along the project life cycle as an effort to actively improve the democratic state of Lesotho in the energy sector. The current discourse aims to inform and sensitize the national policy and the regulatory context of Lesotho, as a democratic state, of the potential impact of the energy democracy agenda in ensuring the sustainable development of decentralized mini-grids. Burke and Stephens, (2017) define energy democracy as a rising social movement making headway for renewable energy transitions by resisting the fossil-fueldominant energy agenda while reclaiming and democratically restructuring energy regimes. Decentralized mini-grids have emerged as a promising solution to address energy access challenges in Lesotho, particularly in remote and underserved areas. It is important to note that as the country seeks to enhance energy security through access, it is equally vital to evaluate the extent to which the integration of socio-political principles may enhance the sustainability of such projects.

The ongoing energy democracy seminars hosted by Energy Democracy in Africa in collaboration with the National University of Lesotho have brought to our attention the existing disconnect between mini-grid stakeholders. The beneficiaries' needs and rights are compromised due to the lack of socio-political considerations in proposed energy innovations like mini-grids. The community representatives, through these seminars, have voiced their grievances with the developers, who are complicit in the inability of such projects to integrate with the socio-economic status of the communities, beyond the provision of electricity access. This imbalance is deemed a threat to the sustainability of such projects. The projects under scrutiny in the seminars include the 52 kW Community Solar Mini-grid at Motete, Butha Buthe, and a 50 kW Independent power producer Solar Mini-grid at Ha Makebe, Maseru. Further grievances reported from the community affected by the Ha Ramarothole Power plant further support this claim. Although the Ha Ramarothole project does not fall under the minigrid development as per the particulars of this study, it does speak on the existing sociopolitical challenges posed by energy transition systems. According to "Villagers demand lifetime projects," (2023), chief Ramarothole said the compensation that the community received for their land is neither sufficient nor sustainable for the people's socio-economic futures. He pleaded with the developers to consider establishing projects that will benefit the present generation as well as the future one in the same way that the cropland sold for the project would have. Energy democracy principles are central to addressing such injustices throughout the whole project's lifetime. Babayomi et al., (2023) state that in the last ten years the Sub-Saharan African region has escalated its rural electrification rate from 17% to 28% but accompanied by

this positive growth are socio-political injustices related to the present models of funding, deployment, and operation of such mini-grid projects.

A more relevant example of the advocacy of the energy democracy movement is a research project by ENR-Demos – Energy Democracy in African countries on Energy democracy and the politics of energy transition in African countries with their information readily available at the website of www.enrdemosproject.net. The project's main aim is to generate robust data on the relations between different actors from the energy sector in African countries as they grapple with the challenges of the energy transition. The data generated through the project is expected to aid the implementation of effective policies and regulations that will accelerate the energy transition and promote energy democracy. The prevalence of energy democracy has led to the argument that in Lesotho's endeavours to transition to renewable energy, there is an urgent need to consider the potential impact of this concept in improving the sustainability of decentralized energy projects. Lesotho's renewable energy industry is still in its infancy, making it an ideal environment for researchers and policymakers to explore democratically structured decentralized energy regimes for mini-grid schemes. Available studies on Lesotho's mini-grid projects demonstrate that aspects of energy democracy tend to be limited to the early stages of these projects through community participation, yet as the projects progress through their life cycle the level of public integration diminishes and is restricted (Tsoeu-Ntokoane et al., 2023; "Villagers demand lifetime projects," 2023). This observed status of the development of mini-grid projects evokes the need to assess and recommend future considerations that can be used to gauge the energy democracy agenda across the life cycle of these projects as a means to guarantee their sustainable development.

1.3 Research Questions

- What are the relevant institutional practices and procedures that can be used to trace energy democracy in decentralized mini-grid projects in Lesotho?
- To what extent are energy democracy principles embedded within decentralized minigrid projects in Lesotho at different phases of the project life cycle?
- What is the energy citizenship status of mini-grid host communities in potentially enabling the functionality of the energy democracy agenda in the development of decentralized mini-grids in Lesotho?

1.4 Study Motivation

This study will contribute to the regional understanding of the application of energy democracy in mini-grid projects implemented in a least-developed African country. The researcher

recognizes that grassroots communities cannot only be seen as recipients of renewable energy technologies and interventions in decentralized energy systems. Rather, communities must recognize their role as active agents in the sustained use of such technologies. Community empowerment through ownership is one way that this can be achieved. The research will therefore contribute to the energy policy design and formulation that informs the integration of standard practices and procedures that reflect energy democracy across key project life cycle phases. Furthermore, the study will explore how these phases can be developed strategically to actively involve the communities they intend to serve. Apart from its potential to unveil novel insights into the development processes and procedures of mini-grids at a project level, the study introduces an interdisciplinary approach where the school of project management meets the school of political science in studying the sustainable development processes of the minigrid deployment. This shows that project management can be extended to the management of institutional practices that guarantee the sustainability of decentralized mini-grid projects. Furthermore, the study is citizen-oriented and therefore addresses the ethical consideration of balancing the power dynamic between the project developer and the project beneficiary. The study also presents the potentiality of bridging technocratic innovation with socio-political development through the promotion of strategic accountability and transparency and institutionally advocating for citizen activism and empowerment across the project lifecycle of mini-grids. This research approach will assist the development of mini-grid projects by highlighting key process areas that can be integral to enhancing and leveraging the competency of the relevant parties according to the institutional practice they are predominantly active.

1.5 Conceptualization

1.5.1 Energy Democracy

The energy transition in terms of decentralized mini-grid installation is in its infancy in Lesotho, with only three mini-grids that are currently active. It is therefore important not to leave behind the concept of energy democracy as an emerging concept that is globally making strides when it comes to enhancing project sustainability. At its core, this concept is meant to restructure the socio-politics of the energy sector's practices and procedures to ensure that no one is left behind in the efforts towards the transition from traditional fossil-fuel energy to modern sustainable energy. Energy democracy will improve policy design in terms of governance structures, social activism, and inclusion in the development practices of decentralized mini-grid projects. The energy democracy elements exist in an interconnected character that speaks on community active engagement and adoption, beneficiary empowerment, the broadening of forms of

community participation, community inclusivity in the energy system's deployment and decision-making, and advocacy of Local ownership for energy systems(Wahlund and Palm, 2022). The principles are defined in detail in the attached Appendix 1. All that binds these elements together under the energy democracy agenda is their institutional integration into the energy landscape.

1.5.2 Decentralized Energy Systems

A decentralized energy system is defined as a system in which energy is generated and distributed in isolation to the main grid through a renewable energy source (Situmbeko, 2017). Existing literature by Tsoeu-Ntokoane et al., (2023) on decentralized energy systems in Lesotho has been observed to demonstrate aspects of energy democracy to a satisfactory level as compared to a centralized energy system because of the bottom-up approach to project development and implementation. In addition, Brisbois, (2020) posits decentralization as a core attribute that defines the energy transition objective and at the centre of its actualization sits the need for complementary innovative energy governance approaches from both a project and institutional stand point. In support of this notion, the study aims to build on these findings by breaking down these decentralized energy systems at the project level to identify and trace the formulation approaches of project practices that are directly linked to the energy institution of Lesotho against the overarching democratic agenda. Operationalizing the decentralization of energy systems allows for the identification of possible governance gaps that need to be considered to guarantee sustainable project development.

1.5.3 The Project Life Cycle Approach

At different phases of the mini-grid project life cycle, the involvement of energy actors differs depending on their responsibilities, authority, and jurisdiction. Understanding the processes involved and the roles of each energy actor in each phase of the project life cycle will help to identify which energy democracy principles are relevant and applicable for a particular phase of the project. This is important in formulating a structured approach of integrating energy democracy principles, to avoid the traditional generalization approach of its application that prioritizes certain phases of the project and neglects others. This approach tends to compromise the intended sustainability of mini-grid projects. The breakdown of the project in life cycle phases increases the effectiveness of measuring the impact that such socio-political strategies may have on the overall functionality and sustainability of decentralized mini-grid projects. Furthermore, the study can serve as a benchmark for similar future energy projects, for how to trace the level at which a mini-grid project integrates socio-political strategies in its practices and development procedures. Since stakeholder management along the project life cycle approach allows for significant improvement in the project performance, it is only logical to

trace the socio-political significance of the energy democracy agenda that informs the practices and procedures executed by the said stakeholders (Dwivedi and Dwivedi, 2021). The analysis will be broken down into four project life cycle phases, namely; the inception and planning phase, the design and development phase, the build and commission phase, operations, and finally the maintenance phase.

1.6 Organization of the Research Study

This section of the study seeks to provide the reader with a guide on the organizational structure of the research report. The first chapter which this sub-section is found in it is the contextual background. This chapter establishes the foundation of the study by introducing to the reader to the research problem, research questions, hypothesis, the study motivation, preliminary conceptualization approach. The second chapter entails the conceptual framework which focuses on reviewing the literature which establishes prior complementary research to position the current study in the identification of the outlined research gap in chapter one. Chapter three gives an account of the research methodology where the methodology framework, research approach, research strategy, data collection are outlined and validated. Chapter four is the research findings and discussion which highlight and analyse the key findings of the research study. Chapter five is the conclusion section of the study which summarizes the main findings and proposes future considerations envisioned to be the key contribution to the institution that facilitates the development of decentralized mini-grids in Lesotho. The final sections of the study outlines the limitations of the research project followed by the list of references and the appendix section.

CHAPTER 2: Conceptual Framework

2.1 Introduction

In tracing the energy democracy agenda in decentralized mini-grids in Lesotho, this paper aims to contribute to the knowledge production that will be significant for Lesotho's energy policy formulation that aligns with the broader national objective of sustainable development. An indepth review of the literature review is essential to accurately position the findings of this study to validate the importance of existing research while also adding to the discourse of energy democracy in the prevalent national and international energy transition initiatives. The literature review is divided into two main components; the empirical review section and the project management review section. The empirical literature review highlights the ground study examples that embody the energy democracy agenda and identifies key activities that directly

speak to the energy democracy agenda. The project management review considers the energy projects according to the project life cycle stages and provides an overview of standard practice in the specific project phases. A combination of this literature review approach allows for an extensive understanding of the energy democracy agenda in a case study context which facilitates a project management approach of identifying the nuances that exist in standard practices of decentralized energy systems for analysis against the energy democracy agenda.

2.2 Empirical Literature Review

In their systematic review, Duran and Sahinyanzan, (2021) examined 104 rural renewable electrification projects to identify drivers of project success and community benefits. They emphasized the importance of community involvement, local capacity building, and early engagement in project design. In the same study, Duran and Sahinyazan highlighted challenges associated with projects dependent on central maintenance crews or imported components, stressing the need for local training and capacity building (Duran and Sahinyanzan, 2021). Community engagement, such as the establishment of village committees or local maintenance teams, was found to enhance project acceptance and participation at the local level (Duran and Sahinyanzan, 2021). They argued against top-down approaches that neglect local needs, advocating for continuous community engagement to maintain project momentum. Furthermore, Duran and Sahinyanzan, (2021) emphasized the importance of training local personnel for equipment maintenance and storing spare parts locally, particularly in decentralized communities. Their study empirically verified the essential role of community involvement in ensuring the success of decentralized rural electrification through mini-grid projects. By integrating local knowledge and capacities into project planning and implementation, Duran and Sahinyanzan, (2021) argued for sustainable energy project development and lasting community benefits that align with their needs and preferences.

The research by (Babayomi et al., 2023) provides a comprehensive review of the current status and key considerations surrounding the deployment of off-grid renewable mini-grids in SubSaharan Africa (SSA). The study covers various aspects, including the level of mini-grid deployment, and multi-criteria decision-making models for optimizing engineering, economic, and management interests in mini-grid setting and design. It also addresses the finance, policy, and tariff status for mini-grids in the region. A crucial finding highlighted in the review is that mini-grids designed for electrification purposes must be technically reliable, economically cost-effective, environmentally viable, and socially acceptable, with relevant policies to support their implementation (Babayomi et al., 2023). The actualization of mini-grid projects is inherently a multi-criteria challenge, requiring lead stakeholders to choose the relevant implementation tools that are accompanied by a robust understanding of the energy needs and

preferences of the project host communities. For instance, during the conceptual phase of minigrid projects, the developers are tasked with identifying the various needs of the communities. These needs can vary depending on factors such as the community's desired level of ownership, maintenance, and operation of the mini-grid.

In the case of a community that does not wish to take ownership or maintain the mini-grid, resource investments in local technical expertise may not be required. Education is therefore critical for such a community to make informed decisions when asked about their needs with respect to the proposed mini-grid projects. The review emphasizes the vital role of engaging the support of the entire community as much as possible through agencies of mediation and consultation, including the rallying of community leaders, traditional rulers, community development associations (CDAs), and local government and town hall meetings (Babayomi et al., 2023). This is crucial to mitigate challenges associated with community participation, such as a lack of clearly defined commercial/community ownership structure, infrastructural insecurity, and community illiteracy on sustainable energy practices. The review suggests several solutions to address these challenges, including effective community participation and engagement, clearly defined commercial/community ownership structure, collaboration with community security groups, and public energy education and advocacy campaigns (Babayomi et al., 2023). By adopting these collaborative approaches, mini-grid projects in SSA can be designed and implemented in a way that aligns with the needs and preferences of the project host communities, ultimately enhancing the reliability, cost-effectiveness, environmental viability, and social acceptability of these decentralized electrification solutions.

Gill-Wiehl et al., (2022) conducted an analysis of literature focusing on community participation in private mini-grid projects in low- and middle-income countries between 2000 and 2020. Their study aimed to understand how community participation is defined when it arises in project phases and its impact on project sustainability. The findings revealed that community participation was most prominent in the Operation and Maintenance stage of minigrid projects, although it also occurred frequently during the inception stage in the form of system planning and meetings (Gill-Wiehl et al., 2022). Moreover, the analysis showed that community participation was often associated with positive social outcomes, including an increased sense of ownership, equity, adaptability to local context, and longevity of the technical system. From the case studies examined, the authors compiled a set of best practices. They suggested that developers should engage key individuals in the community to disseminate information and encourage participation from women, poorer customers, and marginalized individuals to prevent elite takeover and subjugation (Gill-Wiehl et al., 2022). Additionally, establishing a clear local governance structure or adapting an existing one tailored to the

community being served was recommended. This includes committees with bylaws and specific meeting times, providing an accountability model for successful operation and ensuring the longevity of the system (Gill-Wiehl et al., 2022).

In their study, Akinyele et al., (2018) delved into the intricate dynamics of micro-grid system planning, particularly focusing on the role of community interaction and engagement in ensuring project success. They emphasized the pivotal nature of community involvement at the planning stage, highlighting its significance in achieving sustainable energy planning and development. The researchers identified this lack of community participation as a primary factor contributing to micro grid failure, emphasizing the need to integrate local stakeholders into the decision-making process. Moreover, the authors underscored the common occurrence of donating renewable energy systems, such as PV-based street lighting and water pumping systems, to communities in Nigeria without adequate community engagement strategies in place. This approach often results in challenges related to the long-term sustainability of the systems, particularly concerning operation and maintenance. Additionally, the issue of land ownership emerged as a significant obstacle, particularly when there was a lack of mutual agreement between project stakeholders and the community. To address these challenges, Akinyele et al., (2018) advocated for a more collaborative approach to microgrid system planning, emphasizing the importance of establishing robust community engagement mechanisms from the outset. They suggested that involving local stakeholders in decisionmaking processes not only fosters a sense of ownership and responsibility but also enhances the overall viability and longevity of microgrid projects.

The study conducted by Muhoza and Johnson, (2018) delves into the user experience associated with connecting to and using electricity services from a 60 kW solar mini-grid in Mpanta, a rural fishing community in northern Zambia. Employing user journey mapping methods from service design, the research aimed to identify the factors influencing users' retention or disconnection from the electricity service pathway post-connection (Muhoza and Johnson, 2018). The findings revealed several critical insights. Firstly, it was observed that the community's understanding of the limitations of the electricity service was lacking during the project's implementation phase. Many households expressed dissatisfaction with the duration of electricity availability, expecting a continuous supply of 24 hours a day rather than the provided 14 hours. These discrepancies underscored the importance of establishing a shared understanding between project designers and users regarding the direct and indirect implications of the services offered and associated costs (Muhoza and Johnson, 2018).

Furthermore, the study highlighted the significance of early engagement with potential users during the mini-grid design phase, highlighting the significance of the timing of this

engagement. Lack of community involvement led to mismatches between user preferences and the implemented tariff structure, with many users expressing a preference for a pre-paid metering system over flat rates. The absence of clear communication and thorough education about payment mechanisms before connection could have contributed to the significant drop in connected households over time, indicating a failure to effectively integrate local sociopolitical dynamics into the business model and service design (Muhoza and Johnson, 2018). The research emphasizes the necessity of user-centered approaches in the design and implementation of energy access projects. Engaging with communities from the outset, prioritizing education about the planned services, and transparently communicating in depth about costs and service limitations are vital for ensuring that electricity services meet users' needs and expectations while fostering long-term adoption and sustainability.

Nyarko et al., (2023) conducted a study focusing on the drivers and challenges of implementing Off-Grid Power Systems (OGPS) projects, particularly in rural areas. The research involved a review of previous studies conducted in the sub-Saharan region, as well as a short survey conducted in Ghana. One of the key drivers identified in the study was the willingness of residents in rural areas, particularly in the Upper West region of Ghana, to participate in the implementation of OGPS projects. However, a significant constraint highlighted by participants was the lack of end-user participation in the planning of energy services. This lack of involvement was deemed detrimental to the social sustainability of such projects (Nyarko et al., 2023). The importance of community participation in mini-grid projects was underscored by a comprehensive review of similar initiatives worldwide. It was found that while community inclusion was predominant in the operations and maintenance phase, it was least involved during the design phase. This gap in involvement could lead to mistrust among locals and potential rejection of the system, with residents perceiving the central grid as a superior alternative (Nyarko et al., 2023). Evidence from a study in rural Sierra Leone supported the notion that community engagement catalyses the acceptance of renewable energy-based minigrids. Failure to involve communities from the outset may result in costly mistakes, such as inaccuracies in determining the load profile, leading to issues with system sizing (Nyarko et al., 2023). However, while community input is valuable, solely relying on their judgment in expressing energy needs may pose challenges in the future. Lessons from Senegal demonstrate that estimating electricity needs based solely on customer judgment could lead to demand challenges as consumers tend to acquire more appliances over time. Additionally, the lack of education and skills training among residents makes it difficult for them to operate and manage the system effectively (Nyarko et al., 2023). The study emphasizes the importance of community participation in all stages of OGPS project implementation, from design to operation and maintenance. Engaging residents from the outset fosters trust, ensures project

sustainability, and helps mitigate potential challenges associated with system sizing and future demand fluctuations.

2.3 Mini-grid Project life-cycle Benchmark and Good Practice

To fully understand mini-grids at the project level, it is essential to highlight the main functions of each phase of the project life cycle and to identify the key actors and their roles in the implementation of mini-grid projects. Similar to Gill-Wiehl et al., (2022), the process of tracing energy democracy in mini-grid projects will use the UN/ SE4ALL's life cycle phases, which will consist of the inception and planning phase, design and development phase, build and commissioning phase, and the operations and maintenance phase. In Lesotho, the key actors involved in mini-grid projects in Lesotho include the Ministry of Energy (Department of Energy), Lesotho Energy and Water Authority (LEWA), the mini-grid developer, an Engineering, Procurement and Construction Contractor (EPC), and the beneficiaries. The Ministry of Energy is mostly involved in the planning aspect of the project, where their role is to advocate for the public by providing procedural guidelines and standards required to execute such a project in line with the existing energy policy. LEWA as a regulator is involved in the license application, the project approval procedure, and overseeing the technical and economic functionality and quality of the project. The mini-grid developer, depending on the project conditions either set by the financier, the regulator, or the government, oversees and ensures that the project is correctly implemented from start to finish. The EPC is engaged in the engineering, procurement, and construction aspects of the project through the liaison of the developer.

2.3.1 The Inception and Planning Phase

The inception and planning phase of the project is concerned with the definition of project goals and the approach which may include the setting of outcomes, expected mandates, and responsibilities of implementation partners in line with initial financing, project initiation, planning procedures, and decision-making processes (Energypedia, 2020; Gill-Wiehl et al., 2022; United Nations Foundation and Sustainable Energy for All, 2019; United Nations Industrial Development Organization, 2020). At this phase of the project, the focus is mostly on the selection of the site, the conduction of a feasibility study, the initial drafting of the implementation plan, and an Environmental and Social Impact Assessment (ESIA). Best practices dictate that community participation should be initiated during the system's inception (e.g., by the initial site visit) to build trust and gain context for the project (Gill-Wiehl et al., 2022). There are several ways in which the community can participate in the inception phase. One of them includes the community's contribution to the capital costs of the project (ESMAP,

2019). These capital cost contributions are the starting point for community involvement, but often the community's role would then extend into the planning activities of the project as well. Another way to establish rapport and involvement is the creation of user committees to manage the process of the project from initiation to continued operation.

In off-grid programs, the involvement of rural communities, particularly their participation in decision-making committees, has added value to the planning process and given communities a sense of ownership (Debajit and Akanksha, 2013). It is important to create an easily understandable plan of action with the community. The community can also be engaged in meetings, as a way to open dialogue between them and other stakeholders; the frequency of these meetings and the percentage of community participation during planning is key to ensuring eventual financial and technical support during operation (Gill-Wiehl et al., 2022). Other activities highlighted in the literature that contribute to the success of mini-grid projects during the inception phase are the establishment and capacitation of a suitable community for the project, clear identification of the different roles and responsibilities of community members, transparency and open dialogue with and from the community, and the assessment of knowledge and available local skills should be used to develop a capability building and development plan (Madriz-Vargas et al., 2015). Community involvement at the inception phase does not always result in positive outcomes there have been incidents where the involvement of the community has resulted in negative social and economic effects (Gill-Wiehl et al., 2022).

2.3.2 The Design and Development Phase

The design and development phase of the project utilizes the results from the demand assessment and feasibility study. They typically inform the facility and the system design to be utilized and this is mostly accompanied by procurement documentation and project development procedures (Energypedia, 2020; Gill-Wiehl et al., 2022; United Nations Foundation and Sustainable Energy for All, 2019; United Nations Industrial Development Organization, 2020). The design aspect of this phase mainly focuses on the generation asset design, distribution grid design, component selection, and technical specification that adhere to the technical regulations and standards. The development aspect encompasses the license application to the regulator, preparation of the bills of quantities, procurement, and contracting procedures. By actively involving community members in the design process, developers can ensure that mini-grid systems are finely tuned to meet the specific needs, preferences, and capacities of the local population. Through robust engagement with community members, developers gain invaluable insights into factors such as demand estimation and willingness to pay, crucial for determining project feasibility and sustainability. Additionally, community

involvement in identifying productive loads helps maximize the socio-economic benefits of mini-grid systems (Gill-Wiehl et al., 2022; Madriz-Vargas et al., 2015).

Strategic planning is significantly enriched by community participation, with residents offering valuable perspectives on potential challenges and opportunities. For example, their input on theft policies and ecological conservation measures can ensure the project's social and environmental sustainability. Moreover, involving communities in the design process fosters a culture of ongoing learning and innovation, enhancing the replicability and adaptability of mini-grid designs across different contexts (Madriz-Vargas et al., 2015). Realistic project implementation schedules are essential, and community input is invaluable for anticipating and addressing potential setbacks and project delays. By actively involving community members in the planning process, developers gain a deeper understanding of the local context, enabling them to tailor their approach accordingly. This not only keeps the project on track but also fosters community ownership and buy-in, a crucial aspect emphasized by Madriz-Vargas et al., (2015). Furthermore, social and environmental considerations, such as waste management and safety measures, are greatly enhanced through community engagement. By consulting residents, developers can identify potential risks and implement appropriate mitigation strategies, thus safeguarding the well-being of both the community and the environment (Madriz-Vargas et al., 2015).

2.3.3 The Build and Commissioning Phase

The build and commissioning phase is the manufacturing, construction, and installation phase for the deployment of the mini-grid system hardware. This also involves labour recruitment, procurement of building and system components, and their logistics (Energypedia, 2020; GillWiehl et al., 2022; United Nations Foundation and Sustainable Energy for All, 2019; United Nations Industrial Development Organization, 2020). At this stage of the project, the customer agreements and power purchase agreements are finalized by respective stakeholders. In the Build and Commissioning Phase of mini-grid projects, community engagement stands as a cornerstone. This involvement begins with the procurement stage, where tapping into local resources for construction materials not only fosters economic growth within the community but also ensures a sense of ownership and participation (Gill-Wiehl et al., 2022). Expanding the scope of community involvement, there lies an opportunity in the realm of equipment manufacturing, if the necessary expertise is available or can be cultivated locally, communities can play a pivotal role in manufacturing equipment required for installation (Gill-Wiehl et al., 2022). This dual benefit of fostering skills-building within the community and maintaining quality standards bodes well for the long-term sustainability of mini-grid projects (Nerves et al., 2015).

The significance of engaging communities throughout the project life cycle cannot be overstated, as it not only streamlines the construction process but also leads to significant cost savings in labour (Gill-Wiehl et al., 2022). Through such comprehensive community involvement, mini-grid developers can foster a sense of ownership and trust within the community, ultimately leading to increased buy-in and project success (Nerves et al., 2015).

By intertwining community empowerment with project development, mini-grid initiatives not only address energy access challenges but also contribute to sustainable community development and empowerment.

2.3.4 The Operations and Maintenance

At this phase of the project, mechanisms are put into place to ensure the system operates optimally to service the needs of the consumer without interruption. To ensure this happens, this phase should pay particular focus on the project's ownership and responsibility structure, tariff collection strategies, financial modeling, human resources, customer service, and demand management (Energypedia, 2020; Gill-Wiehl et al., 2022; United Nations Foundation and Sustainable Energy for All, 2019; United Nations Industrial Development Organization, 2020). The operations and maintenance phase of mini-grid projects encompasses a wide array of activities crucial for sustained functionality. Given the geographical distance between project sites and developers' or funders' headquarters, communities often shoulder significant responsibility for managing and operating the systems (Debajit and Akanksha, 2013). This heavy reliance on community involvement in operation and maintenance, particularly in minigrid projects, carries implications for local job creation. Operators must prioritize training local workers in the labour, technical, and maintenance aspects to ensure the sustainability of the systems. This approach not only fosters a virtuous cycle within the community but also enhances local capacity (Gill-Wiehl et al., 2022). Community involvement extends beyond maintenance responsibilities, to include utilizing local agents for tariff collection from users. Moreover, community participation in tariff collection and daily technical or non-technical maintenance, often through volunteerism or involvement in operation and maintenance committees, is vital for sustaining decentralized energy service operations (Gill-Wiehl et al., 2022; Madriz-Vargas et al., 2015).

Furthermore, community participation can influence electricity demand on the mini-grid. Community members can play roles in generating interest, offering services to potential clients, and providing follow-up assistance, potentially on a commission-based basis (Pollinate Energy, 2015). Additionally, community involvement is instrumental in shaping energy consumption patterns and preventing overuse. Educational components must be integrated to ensure users understand system usage, demand-side management, consumer rights and responsibilities, and

disconnection policies (Wiemann et al., 2011). Another way to stimulate demand and increase energy efficiency is through appliance financing programs and the provision of energy-efficient appliances, especially for productive uses. Building relationships beyond the mini-grid, through participation in community activities, is also crucial for operators or representatives from mini-grid developers (Gill-Wiehl et al., 2022). This holistic approach to operations and maintenance ensures the sustainability and effectiveness of mini-grid projects while fostering community empowerment and economic development.

CHAPTER 3: Methodology

3.1 Introduction

This chapter embarks on a detailed exploration of the methods used to address the research question. It starts by explaining the overall approach, then moves on to discuss the research strategy, and finally, describes the methods used for data collection. Finally, the chapter will evaluate the reliability and validity of the chosen methods.

3.2 Methodological Framework

Effective research relies on thoughtful methodological decisions. To illustrate the research process, the "onion" framework-as illustrated in the below Figure 1: Research Process Adapted from (Saunders et al., 2019) is adopted. This framework offers a structured overview of the steps taken in the study, providing a clear and comprehensive understanding of the methodology.

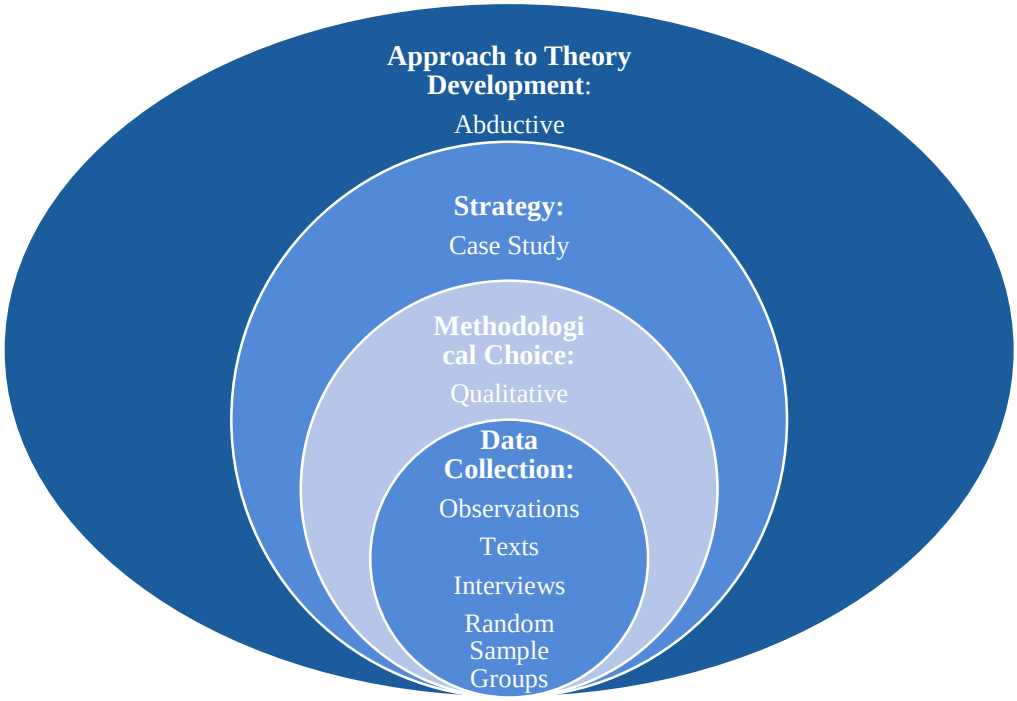

Figure 1: Research Process Adapted from (Saunders et al., 2019)

3.3 Research Approach

The importance of whether your research leans towards theory testing or theory building prompts a significant consideration regarding the design of your research project. This distinction is often presented as a choice between three contrasting approaches to reasoning: deductive, inductive, or abductive. Deductive reasoning is characterized by the derivation of conclusions from a logically defined set of theory-derived premises, with the conclusion being deemed true when all premises are true (Saunders et al., 2019). Conversely, inductive reasoning involves a gap in logical argumentation between the observed premises and the conclusion, with the conclusion being 'judged' to be supported by the observations made (Saunders et al., 2019). Instead of following a unidirectional path from theory to data (deduction) or from data to theory (induction), an abductive approach involves moving back and forth, effectively combining deduction and induction (Saunders et al., 2019).

This research takes on a qualitative abductive approach, where energy democracy as a theory is set as the research foundation which will be traced and tested within practical energy projects using the collected data. The abductive approach is selected because it is deemed most suitable for a topic where there is abundant information in the theoretical context but comparatively less in the project development context being researched. This situation may favour an abductive approach, allowing for the modification of an existing theory (Saunders et al., 2019). In the context of this study, one will note that energy democracy as a theory has generated significant research in more developed parts of the world. Local academics, and energy professionals in Lesotho can therefore benefit from this abductive approach, as there is much less on this subject locally. (Tsoeu-Ntokoane et al., 2022).

3.4 Research Strategy

A research strategy serves as a blueprint detailing how a researcher will address the research question. It acts as the methodological bridge between philosophy and data collection and analysis methods (Saunders et al., 2019). In this study, the primary research strategy employed is a case study. A case study involves a deep exploration of a topic or phenomenon within its authentic real-life setting. This strategy enables researchers to glean insights from comprehensive investigations, shedding light on the intricacies of a phenomenon within its natural context. This leads to rich empirical descriptions and theory development (Yin, 2018). Case studies can be crafted to uncover both the what and the why, shedding light on the effects of a situation and its implications for action. To attain such insights, case study research leverages data from a variety of sources to fully grasp the dynamics of the case (Yin, 2018). The case study analysis in this study is based on two decentralized mini-grid projects that will

utilize the research approach of a project life cycle. The main objective of this study is to trace energy democracy in existing decentralized mini-grid projects and interpret its elemental influence on the sustainability of such projects. The question at hand, is "To what extent are energy democracy principles embedded within decentralized mini-grid projects in Lesotho at different project life cycle phases?" This question requires an in-depth description that determines the extent to which energy democracy can be seen within the life-cycle of decentralized mini-grid projects in Lesotho. It answers the question of how energy democracy principles are practiced if at all in the projects. As pointed out by Yin, (2018), this makes the case study strategy suitable for this research.

Another rationale for this selection is that a case study strategy proves particularly valuable when the researcher aims to achieve a profound comprehension of the research context and the ongoing processes (Morris and Wood, 1991). As previously noted, energy democracy remains a nascent phenomenon within the landscape of Lesotho. Therefore, evaluating relevant institutional practices and processes, and the existing agency and activism of the beneficiaries in decentralized energy projects, can provide a solid contextual groundwork, facilitating the formulation of recommendations for future actions. The detailed framework of a case study research design allows for the identification of contextual variables that may otherwise influence the unit of analysis (Babbie and Mouton, 2001). For this reason, it is critical to describe both the setting and environment of the selected decentralized mini-grid projects. Out of a handful of operational mini-grids in Lesotho, the decentralized mini-grid projects to be studied are the 50 kW at Ha Makebe, Berea, and the 52 kW at Motete, Botha Bothe. This selection is based on the differences found in their governance and operational structures, the nature of the settlements, and their development approaches. Motete is located in a rural region of the country in the Botha Bothe district. The project development is overseen by the Smart Village Research Group's sister company (SVRG) together with MOSCET and the National University of Lesotho represented by the Energy Research Centre under the technical guidance of one Gram Oorja from India (Tsoeu-Ntokoane et al., 2024). The primary characteristic of the Motete mini-grid is that its operation and governance structure are based on the community ownership ideology. Ha Makebe is also a rural village located in the Berea district with a community population of nine hundred (Tsoeu-Ntokoane et al., 2023). The Ha Makebe minigrid is considered a private mini-grid that was financially facilitated by a loan from the Renewable Energy Performance Platform with its operation and governance overseen by an independent power producer called OnePower Lesotho (Pty) Ltd.

3.5 Data Collection

The following section delineates and elucidates the data collection methods utilized in this study. Initially, a conceptual framework for data collection is introduced, along with a broader discourse on the decision to adopt a qualitative approach. Subsequently, a thorough examination of each empirical data collection method employed is conducted.

3.5.1 Conceptual Framework

The study utilizes the conceptual framework of energy democracy as a governing social technology established as a result of the prevailing energy transition. Hvelplund, (2014) discusses the causal relationship between technological innovation and the political domain, where technological innovation that comes with energy transition demands a complementary technology of governance. This results in the creation of political subjects hence the birth of the energy democracy. This socio-technical imaginary puts forward that the traditional consultation approach has proven to be meaningful towards energy projects to ensure the adequacy of the response to socio-economic rights (Tsoeu-Ntokoane et al., 2024). Energy democracy as a particular democratic imaginary then seeks to broaden the scope of the stakeholder's contribution towards the sustainability of energy projects within the energy transition. According to the energy democracy concept, this is done by shifting the public from passive contributors towards being political subjects that are actively involved in the deliberation processes of the projects across the entire life cycle, while the technical experts involved exercise their responsibilities with a sense of obligation towards the public without direct oversight (Szulecki, 2018). In this study, the research strategy to trace the energy democracy on the side of the expert stakeholders involves an investigation of the institutional practices and processes involved per phase of the project life cycle while on the beneficiaries' side the focus is on evaluating their activism and agency status as energy citizens on whether they exhibit the qualities to integral to the advancement of the energy democracy agenda.

3.5.2 Qualitative Methods

This dissertation is a qualitative research study. In this study, qualitative data serves as a powerful means to unravel the complexities of energy democracy within decentralized minigrid projects. By employing qualitative methods such as interviews, random sample groups, observations, and report scrutiny, the study can delve deeply into the varied experiences, perceptions, and interactions of stakeholders engaged in these projects (Rahman, 2017). Qualitative data offers researchers the opportunity to capture the diverse perspectives of technical experts and community beneficiaries regarding their roles, responsibilities, and aspirations within mini-grid initiatives (Richardson, 2012).

Moreover, qualitative data provides valuable contextual insights into the challenges and intricacies involved in fostering energy democracy within decentralized mini-grid projects (Pitt

et al., 2018). By immersing themselves in the socio-cultural context of project communities, researchers can identify the subtle power dynamics, social norms, and institutional structures that either facilitate or impede the achievement of energy democracy objectives. Furthermore, qualitative data allows researchers to generate inductive insights and theories grounded in the empirical realities of mini-grid projects. Through approaches like grounded theory, researchers can identify emerging themes, patterns, and explanatory frameworks that shed light on the dynamics of energy democracy in practice (Saunders et al., 2019).

The methods employed in the gathering of empirical data for this research are observations, texts, and interviews. (Babbie and Mouton, 2001) highlights the importance of using multiple sources of data in case study research as it improves the description aspects of the analysis and gives the researcher confidence in the reliability of the findings. The data collection methods are based on qualitative techniques. Based on the conceptual and theoretical review, the study has identified two types of categories in collecting primary data, this is done by randomly sampling the intended respondents for the community beneficiaries and establishing institution representatives for development experts.

The interviews were reserved for the development experts. This was done with the premise that they could allow one to interrogate the characteristics of the existing practices and processes involved at each phase of the project life cycle. The sources of data include primary data acquired from interviews with one representative from the Ministry of Energy (Department of Energy), LEWA, the mini-grid developer, and the EPC as key actors along the life cycle of the mentioned mini-grid projects. The project host beneficiaries, with a projection of ten households chosen at random, participated in a questionnaire process for data collection. The questionnaires sought to observe whether the participants exhibited the characteristics of democratically active citizens in the development of the decentralized energy projects. The selection of ten households was based on the fact that the number would account for every possible demographic within the community where a smaller data sample would not be an adequate representation and a larger one would cause a duplication of results. This would also would have been time-consuming given the time constraints of this project. The primary data was supplemented by secondary data gathered from desk top research. That phase of data collection involved reviewing existing project reports, regulations, acts, national initiatives, and policy documents. The study then transcribed the interviews and used the Nvivo software to theoretically triangulate the data based on the themes of energy democracy. The results were consolidated with other sources of analysis.

CHAPTER 4: Research Findings and Discussion

4.1 Introduction

As part of the ongoing discourse on the energy democracy agenda, this research focuses on evaluating how embedded the concept is in the existing development of decentralized minigrids in Lesotho. Institutional practice and citizen (beneficiaries) reception are particularly relevant in this evaluation. Research by Laakso et al., (2023) highlights the importance of energy democracy in the discourse of addressing the existing democratic structures as either being a deterrent for energy citizenship or as a stepping stone for forums for deliberations that, to the best of their ability, echo the everyday living. This notion presents the potentiality of energy democracy to be part of the customary governance and management of decentralized energy systems in host communities.

This section of the study is divided into two components. The first component scrutinizes the available legal and national initiative frameworks based on the general discourse of sustainable energy systems in Lesotho. This segment seeks to provide an overview of the extent to which principles of the energy democracy agenda can be seen to inform our existing legal and national initiative frameworks as part of the ongoing global energy transition development objective.
The main sources used for discussion in the first component of this section include the Lesotho SEforAll Country Action Agenda and Investment Prospectus, the Mini-Grid Power Generation, Distribution and Supply Regulations 2021, the Lesotho Energy Policy 2015-2025, Lesotho Electricity Authority Act 2002, NSDP II Strategic Focus Report, National Sustainable Energy Strategy report (Draft) and the Lesotho Electrification Master Plan report (Off-Grid Master Plan).

The second component of the chapter primarily focuses on the interrogation of the mini-grid case studies as decentralized energy systems based on the institutional processes and the degree of activity of host communities as energy citizens. This part of the results and analysis section primarily focuses on establishing the relevant institutional practices and procedures that can effectively be used to trace the energy democracy agenda which are then matched with the project life cycle phase they predominately exist in. This segment further explores the status of energy citizenship for the mini-grid host communities under the potentiality of energy democracy as a governing technology for the development of decentralized mini-grids. The analysis was based on an abductive qualitative analysis approach. Based on the research questions, the coding of the results was based on the dominant practices and procedures for each life cycle phase of the project and then mapped against the prevailing principles of energy democracy using the Nvivo software as presented in the codebook attached in Appendix 1. The data collected includes an interview from the Energy Research Centre at the National University of Lesotho and MOSCET as the leading developers for the Motete mini-grid project,

an interview from OnePower as the developer of the Ha Makebe mini-grid project, and an interview from LEWA and DoE in line with both the Motete and Ha Makebe mini-grid projects.

In addition, ten household respondents from Motete and Ha Makebe each were given questionnaires as part of the primary data collection process. Furthermore, the Motete community engagement report, a Concession Agreement, an Environmental and Social Impact Assessment report, license application report for Ha Makebe were part of the supporting secondary data used to complement the primary data collected. While this research traces elements of energy democracy from a project life-cycle approach, it is important to note that the practices and procedures during the analysis were seen to overlap across the life-cycle stages depending on the approaches of the respective developers. In other words, certain data, dynamics of interaction, and outcomes could be observed in the inception stage for one project, and in the development phase of another project, or all stages of the life cycle throughout the existence of the project. This variation in developmental approaches is owed to the conditions and requirements dictated by the financier and the business and governance model the project is based on.

The Motete mini-grid project was mainly financed by a grant from Innovate UK while the Ha Makebe project was financed through an investment model by the founders of OnePower. The results discussed herewith, therefore unfolded in this overlapping manner. For the sake of this study, however, the findings are categorized according to the phases in which they appear most dominantly. These phases are the inception and planning phase, the design and development phase, the build and commissioning phase, and the operation and maintenance phase. Figure 2: Theme coding Hierarchy table Extracted from Nvivo shows the hierarchy of the practices and procedures in terms of the frequency with which they are mentioned by the experts in the interviews. These practices are education, license application, reporting and monitoring, village representative selection, recruitment, village selection, evaluation, and approval.

Figure 2 is interpreted such that a practice and procedure with the largest area indicates a higher frequency, while the smallest areas show the lowest frequency. Based on this interpretation, we see that the education aspect is the most touched on practice with the evaluation and approval process having the least frequency in the interviews. This gives the reader an overview, before the paper delves deeper into the details of the findings, that the education practice is the most prioritized in the development practices of decentralized mini-grid projects. This is then followed by the reporting and monitoring processes while the evaluation and approval process is given the least priority as per the findings from the interviews.

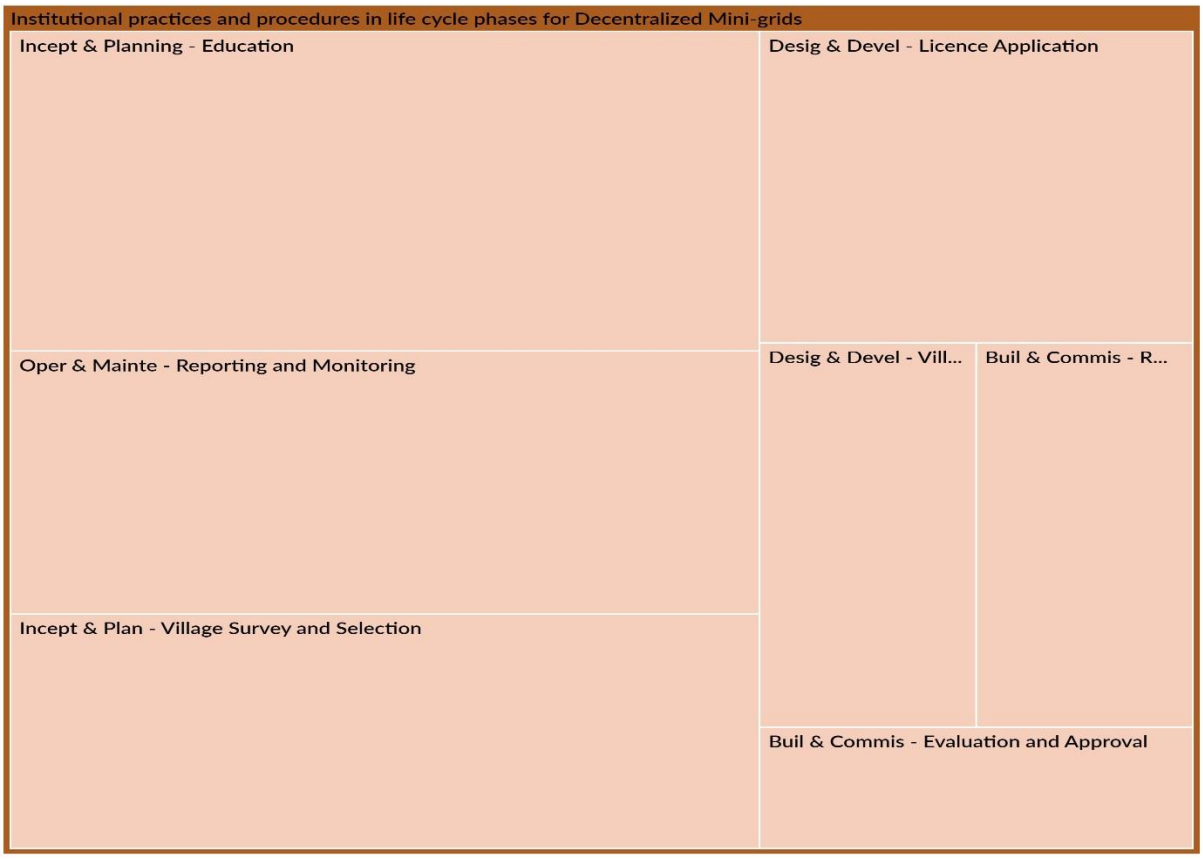

Figure 2: Theme coding Hierarchy table Extracted from Nvivo software

4.2 National Strategies, Policy, and Legal Framework in the Energy Sector of Lesotho

Lesotho as a least developed country has a rather unglamorous advantage of learning from developed countries in terms of development approaches in the energy sector. Hettich and Kachi, (2021) present key considerations for energy systems moving toward decentralized systems, noting that the traditional top-down approach to governance in centralized systems was deemed necessary to open up energy markets for competitive processes and technical innovations, however as it stands, priorities are shifting with societal participation gaining significance in optimizing local energy systems through the facilitation of lawmakers and regulators. It is therefore of importance to Lesotho to activate its policy and legal framework in the direction that optimizes the sustainable function of decentralized mini-grids in actualizing the joint global energy transition goal. Burke and Stephens, (2017) aptly note the importance of policy mixes in disrupting the existing energy regime, while at the same time laying foundations for innovative alternatives that accommodate the importance of energy transitions to sustainability. In addition, Laakso et al., (2023) speak on citizenship being capable of organizing, remaking, and resisting the ethical-political relations with your counterparts to constantly redefine your political contribution to actualize an overall development objective. For citizens to fully exercise their citizenship in energy developments, it is of critical importance that the legal framework that governs them facilitates this dynamic

state of being a citizen. Hence the current research finds it imperative to look into the existing legal framework under the lens of the energy democracy agenda.

The Draft National Sustainable Energy Strategy, Government of Lesotho: Department of Energy, (2017), recognizes the critical importance of extensive consultations to ensure that the strategy is well-informed, inclusive of the population, and effectively drives the development agenda of the energy sector. It was imperative to gather diverse views and gain a deep understanding of the ground realities, including the needs, challenges, and expectations of citizens, to formulate informed recommendations and a roadmap for policy implementation. In the drafting process of the National Sustainable Energy Strategy, Government of Lesotho: Department of Energy, (2017), extensive consultations were conducted nationwide, involving various stakeholders such as academia, government ministries, utility company LEC, the regulator LEWA, civil society groups, district administrators, councillors, Chiefs, as well as grassroots community members across all 10 districts. This broad engagement underscores a commitment to ensuring that the energy strategy reflects the diverse perspectives and needs of all stakeholders as this approach improves its success likelihood (Dwivedi and Dwivedi, 2021).

One of the key aspects highlighted in the strategy, Government of Lesotho: Department of Energy, (2017), is the promotion of one of the elements of energy democracy through government plans to increase local participation in the development of energy resources. These government plans speak, to a certain degree, the broadening of forms of participation by the beneficiaries through private-public partnerships. This signifies a deliberate effort by the government to empower its citizens and involve them directly in the governance and ownership of their development processes. Moreover, the strategy emphasizes the importance of gender inclusivity by calling for all stakeholders within the energy sector to actively promote and facilitate women's participation in various aspects of energy-related education, training sessions, programs, projects, and decision-making processes. This proactive approach acknowledges the crucial role that women play in sustainable energy development and underscores the importance of their involvement in inclusive and equitable decision-making for sustainable outcomes.

Under Pillar 2 of the strategy, which focuses on energy efficiency and demand-side management efforts, there is a clear emphasis on community involvement, consumer education, and the establishment of village committees but lacks the specification on its practical application. (GoL: Department of Energy, 2017). This community-centric approach aims to empower local communities to actively participate in energy management initiatives, thereby fostering a sense of ownership and responsibility for sustainable energy practices at the grassroots level. Overall, the Draft National Sustainable Energy Strategy demonstrates a

commitment to inclusive governance, gender equality, and community participation in shaping the future of the energy sector, laying a solid foundation for sustainable development and progress.

The Lesotho Electrification Master Plan 2017 – 2036 (EMP), (AETS Consortium, 2018), under the branch of the Off-Grid Master Plan (EMP), illustrates a common challenge in energy planning. The approach is seen to be top-down and may not fully embrace democratic principles that ensure project sustainability and the stakeholder theory that improves the success rate of development projects (Dwivedi and Dwivedi, 2021; Szulecki and Overland, 2020). This observation is deduced from the observation that, despite recognizing the ideal of village-level planning, the EMP lacked essential village data, leading to the use of enumerator area (EA) data from the 2016 census as the basis for electrification planning (Fernandez and Tobich, 2018). This approach, while pragmatic, bypassed direct input and accurate representation from potential end users of energy systems. Moreover, the EMP's method of building an energy demand profile for each EA using housing types from the 2016 census as a proxy for affordability further highlights the disconnect between planning and community involvement (Fernandez and Tobich, 2018). While this method provides a rough estimate, it falls short of capturing the nuanced energy needs and preferences of local communities. However, the EMP does propose a method to involve energy system beneficiaries in the ownership models of mini-grids through the setting up of a revolving fund for off-grid electrification (Fernandez and Tobich, 2018). This approach speaks to one of the energy democracy principles on community empowerment by allowing groups of end users to determine their system needs, select their preferred system suppliers, and pool deposit monies from their members. By including communities in the decision-making process and ownership of their energy infrastructure, the revolving fund represents a significant step toward a more democratic energy regime in Lesotho.

In Lesotho, the primary focus in energy planning has been on improving access and efficiency, with less emphasis on democratic principles in development practices and procedures. Both the National Strategic Development Plan II 2019-2023, (Government of Lesotho, (2019) and the NSDP II Strategic Focus 2023/24 - 2027/28, (Government of Lesotho, (2023) highlight the need to enhance energy production, improve access to energy, and promote sustainable usage. Similarly, the Lesotho Energy Policy 2015-2025, Ministry of Energy and Meteorology Lesotho, (2015), shares these priorities, emphasizing access, renewable energy, and energy efficiency. Despite this technical and economic focus, elements within the Lesotho Energy Policy hint at certain key considerations that fall under the energy democracy agenda. For instance, one of the policy principles is the broadening of forms of empowerment for

stakeholders on energy issues through awareness-raising campaigns, education initiatives, and capacity training (Ministry of Energy and Meteorology Lesotho, 2015). While it is positive that stakeholder involvement is recognized as a prerequisite step towards developing a national energy policy, the policy does not explicitly specify whether the beneficiaries of this energy systems will be included among these stakeholders. Another aspect addressed in the policy is the element of transparency in the pricing of electricity, which is a crucial element for energy democracy as it speaks to enabling end users ability to hold responsible entities accountable (Ministry of Energy and Meteorology Lesotho, 2015). Transparent pricing that reflects costs at every stage of the value chain ensures that consumers have access to fair and accurate information, empowering them to make informed decisions about their energy usage.

In Lesotho, while laws and regulations may not extensively promote community participation in energy projects, there are aspects of democratic principles indirectly embedded within them. For instance, the Lesotho Electricity Act of 2002, Government of Lesotho, (2002), includes provisions regarding tariff revision and setting that allow for the participation of end-users in the decision-making process. According to the Act, a tariff proposal must be presented to the general public, enabling them to provide feedback and even present counter-proposals (Lesotho Electricity Act of 2002, Government of Lesotho, 2002). This mechanism speaks to the energy democracy element of community inclusivity in matters concerning energy systems decision-making which ensures that the voices of consumers are considered in the determination of electricity tariffs. Additionally, the Electricity Act mandates that operators holding transmission and distribution licenses must establish customer service dispute mechanisms, underscoring the importance of accountability in a democratic setting (Lesotho Electricity Act of 2002, Government of Lesotho, 2002). This requirement ensures that consumers have recourse in the event of disputes or grievances with service providers. Similar provisions regarding tariff setting and public consultation exist in the Mini-Grid Power Generation, Distribution, and Supply Regulations of 2021 (Energy (Mini-grid) regulations, Government of Lesotho, 2021).

However, the requirement for procedures to settle consumer complaints applies only to minigrids with generation capacities exceeding 1MW (Energy (Mini-grid) regulations, Government of Lesotho, 2021). Despite efforts to involve the general public, the final decision on tariffs ultimately rests with the Lesotho Electricity and Water Authority (LEWA), diminishing the consumer's direct influence in the decision-making process (Government of Lesotho, Energy (Mini-grid) regulations 2021, Lesotho Electricity Act of 2002). While these laws and regulations demonstrate a degree of openness to public input, the ultimate authority still lies with regulatory bodies like LEWA. Enhancing community participation in energy

projects would require further reforms to empower consumers and ensure their voices are heard and considered in decision-making processes.

The Sustainable Energy for All (SE4All) initiative has played a significant role in promoting aspects of energy democracy in Lesotho by adhering to the fundamental guiding principles outlined in the Guidelines for the Development of National Sustainable Energy. The Country Action Agenda (2018), which serves as a comprehensive strategy for energy sector development at the national level, underscores two key principles that enhance democracy in the energy sector: Participation and meaningful involvement of all stakeholders, and Transparency and accountability (UNDP and Government of Lesotho, 2018). The SE4All initiative recognizes that achieving its three energy targets; access, renewable energy, and energy efficiency is essential for improving the socio-economic environment and the wellbeing of the target population. Therefore, it places great emphasis on the involvement of communities in energy discussions, acknowledging their vital role in shaping energy policies and projects (UNDP and Government of Lesotho, 2018). Moreover, the initiative advocates for conducting social and environmental impact assessments before extending grid power to any community or locality. This ensures the environmental sustainability of energy projects and safeguards the interests of affected communities (UNDP and Government of Lesotho, 2018).

Additionally, the SE4All initiative underscores the importance of conducting economic analyses to understand the potential for productive uses of energy within communities, thereby maximizing the socio-economic benefits of energy access (UNDP and Government of Lesotho, 2018). By promoting principles of participation, transparency, and accountability, and by prioritizing community involvement and environmental sustainability, the SE4All initiative contributes to fostering a more democratic and inclusive energy sector in Lesotho. This approach ensures that energy policy, project practices, and procedures align with the needs and aspirations of local communities, ultimately contributing to sustainable development and improved quality of life for all. While it is important to interrogate the above legal framework and initiatives, research by Laakso et al., (2023) shows that in building on the effectiveness of energy democracy as an equity and justice agenda, it is important to consider all manifestations of energy democracy whether it be positive or negative, spectacular or underclass, action or non-action. This approach can provide a broad inclusive and transparent discourse of energy democracy to the relevant stakeholders without bias, contributing to Lesotho's future energy policies.

4.3 Standard Institutional Practices in Decentralized Mini-grid Development

4.3.1 Introduction

The section on institutional practices in mini-grid project development seeks to trace the formulation and governance approaches of project standard practices against the energy democracy agenda and highlight the observed practical implication of these project standard practices on the energy system's overall sustainability. Brisbois, (2020) argues that decentralized electricity systems are characterized by their inherent call to reformulate governance functions that are interconnected in both project and institutional settings without compromising the attention on matters of coherence, inclusion, adaptiveness, capacity building, accountability, and transparency under the guiding agenda of energy democracy. The main aim is to identify governance approaches that either deter or optimize the democratic practice at the project level in connection with Lesotho's energy institution. This section of findings and discussion will lead to the recommendation on future considerations for policy design that seeks to optimize the interconnected relationship of project and institution standard practices that speak directly to actualizing the sustainability of decentralized energy systems in Lesotho. This section is divided according to the project life cycle phases:

- The inception and planning phase
- The design and development phase
- The build and commission phase
- The operation and maintenance phase

4.3.2 Inception and Planning Phase

For this phase, it was identified that the critical, dominant, and relevant processes that can be traced for principles of energy democracy are the approaches to village selection and community education regarding the proposed project. During my interview with the ERC representative on the Motete project, the respondent explained the village selection process as follows:

> "*We select it according to whether the village will have an opportunity to benefit, and also whether it is a village that has the financial capacity to buy electricity. Everyone wants electricity, but not all of them are financially able to buy it, so we don't want to construct that kind of plant and have it generate [electricity] in a place where people cannot benefit from it. That's why we start by surveying different communities/villages, after the analysis we decide on a village and then go back once you have selected the community… Well, first we would have told them that "we are conducting this interview because this village is on the list of villages that may [be eligible for a power plant]."*

So once we return, we tell them that "your village has been selected, as the one that may receive a mini-grid", at that stage, we go to find out what electrical appliances they have, what appliances they have the potential to acquire, and once they have them what do they think they can do, business-wise and so on"

This process is done before the developers apply for funding. All potential villages are surveyed and observed based on the existing financial ability and capability. The prioritization of a financially motivated selection criteria to identify a suitable site for mini-grid installation is a common theme for developing and least-developed countries. Suri, (2020) describes the observed primary concern for developing and under-developed countries in mini-grid installation as the facilities' ability to operate such that there is a guaranteed return on investment within the project lifetime. Since developing and least-developed countries have limited financial resources, this approach is highly favourable to avoid financial uncertainty of the project that may result in external financial intervention as a sign of the project's unsustainability. The analysis and the final decision for the village selection are then done at the discretion of the developer. Once the final selection of the village is made, that village goes through what is called the productive use of energy survey which investigates the potential anchor customers' need for power.

According to the Motete Community Engagement Report (2021), the step that follows is the service value test. The service value test was developed by the SVRG team where data was collected on the productive needs and aspirations of the community such that they may be integrated to improve the whole design process of the mini-grid. The test surveys the static features of the community and the current state of activities that are considered to be of productive energy use. It further assesses the potential extrapolation of such activities for future productive energy use. While it is important to acknowledge that the financial sustainability of mini-grid installation is an essential element in the overall sustainability of decentralized minigrids, studies by Suri, (2020) are redirecting our attention to other project objectives that are equally paramount to contributing to project sustainability which leads to a diverse and inclusive the scope of the survey in the inception and planning phase. In the case of Motete, the approach of the selection criteria is observed to be one-directional, taking away the possibility of the community to offset and participate in developmental strategies that speak to their agency and sovereignty as energy citizens.

The Ha Makebe mini-grid project follows a similar approach with a few differences. The village selection did not go through a filter process similar to the Motete project. In my interview with a representative from OnePower, the village selection process was explained as follows:

"So in our case, if we talk about Makebe specifically, in our case OnePower was a developer who was keen on building mini-grids in Lesotho to solve the issue of rural electrification. And it took it upon itself to start the research, collect the data available, and which areas do not have energy access. Why do they not have energy access? What are the barriers and what are the constraints? Therefore is there a business case to be made here, can this thing be profitable? The key interest is to ensure that this can be run profitably not through subsidies or donations and so forth. So the research was done and it was discovered that there is a business case to be made here, there are ample customers that need energy access, and challenges for getting access to them were identified. This includes road access, socio-economic factors, and so forth. Then from then on it was a case of, okay this has never been done in Lesotho before so we need to go and prove that there is a business case. Meaning that we should initiate a pilot project. A pilot project was done in Makebe with a few households a school and maybe one small business enterprise."

It is also important to add that the village selection for the Ha Makebe project was done solely on an investor model, where OnePower identified a need for electricity access and through their in-house desktop research, independently concluded to initiate the project at Ha Makebe as a pilot project. The Ha Makebe mini-grid can be considered an investment project for OnePower, meaning the primary motivation for such a development is profit. This indirectly dictates the village selection criteria. The ESIA report by OnePower states that to identify a candidate village such as Ha Makebe, a technical-economic analysis was undertaken. The analysis section of the report includes economic considerations such as factors that contribute to low capital costs, lower construction costs, and the state of economic activities that will maximize productive electricity use. The consideration of these factors appeared to be a common theme during the village selection process in both case studies of Motete and Ha Makebe. Based on the above, it appears the village selection processes are centered on the notion that consumption is traced by financial ability and capability, implying that the consumers' role in the process is restricted solely to being economic actors in the proposed energy system.

The other aspect of the analysis included technical considerations such as the facility's proximity to a household density above 10 households per kilometre of wire, the distance from the LEC grid, limited and avoidance of south-sloping, and an area with relatively high irradiance. Based on the narrow account of analysis, the research observes that the approaches of each developer, whether community-oriented or investor-oriented, assume a unilateral dynamic that does not adequately account for the complex socio-political, developmental, and cultural aspects that intersect with the perceived need for electrification access. A study by Riva

et al., (2018) confirms that the traditional adoption of a macroscopic and macroeconomic outlook on the connection between electricity use and development falls short of capturing the full local characteristic parameters of this nexus in poor and rural contexts and it is therefore insufficient for electricity access alone to have a causal effect to development without the supplement of enabling complementary activities and services. In other words, while this present approach achieves the objective of electrification, it tends to parachute these high-cost developments without an ongoing integration plan that links the host community's norms of everyday energy use, which would sustain the uptake of the proposed decentralized energy system. This implies that this approach to the village selection process speaks on community engagement and support but is void of community inclusivity in the deployment and decisionmaking during the inception and planning phase that would otherwise address the dynamism that exists in the electricity use and rural socio-economic development nexus that Riva et al., (2018) emphasize in their study.

Terrapon-Pfaff et al., (2018) mention that while it is true that small-scale energy projects can lead to productive energy use, it is important to note that to achieve this outcome, aspects like capacity building, information provision, and awareness raising are imperative. The findings from this research support the notion that education in its different manifestations is a vital factor in successfully involving the host community in the planning and inception process. This factor significantly speaks to the ability of education to empower the host community to the extent that they actively exercise their energy citizenship role in the deployment of decentralized mini-grids. With regards to the Motete mini-grid project, when the respondent was asked to explain their approach to educating the community in this phase, he responded that once the final stage of village selection was made, they moved on to sensitize the community on what they could expect once the mini-grid project was underway. The respondent further stated that the sensitization process is important because the project is community-based and would ultimately become the responsibility of the beneficiaries. (ERC, 2024).

In addition to the educational processes discussed above, it is also relevant to note that education is one of the practices that overlap across other subsequent phases of the Motete project, as I previously noted. For example, it was mentioned that whenever there was a need to clarify and sensitize the community about certain developments of the project, a community gathering and village committee workshops would be proposed (ERC, 2024). In addition, a manual was devised jointly and furnished to the committee as a point of reference and guidance on the proceedings and responsibilities of the project stakeholders in the development phase of the project. In response to the same question on educational approaches, OnePower explained

that;

> *…"One of the ways is the introductory phase where you first arrive in the community. "We are OnePower, this is what we do, and we specialize in electricity supply, so we are here to bring you electricity"…"Since the infrastructure needs to be located somewhere in the community. This is another aspect of engaging the community, start by letting them know what the plant is going to look like and that it is going to need a piece of land for the generation site, poles are going to be erected maybe some of them in people's yards. And here is the impact this plant is going to have on your land, your privacy, or your private spaces, here are all the anticipated safety risks and their mitigation. Also here are our expectations from you guys as the community in terms of property protection, safety, for example from vandalism caused by children, and all those kinds of stuff.'*

OnePower as a developer further provided the committee with a report that was devised inhouse, which describes the project, the impact of the project on the community, and procedures in case of emergencies. Based on the above responses and in line with the energy democracy principles outlined in Appendix 1, the education approach of each of the mini-grid developers achieves the goal of building awareness and sensitization about the need for development as well as its most basic functions. However, it does not fully achieve the educational goal and falls short of fostering active engagement and beneficiary empowerment, something that could only be achieved by fostering informed citizens who can hold other stakeholders accountable during the deployment and decision-making processes.

From a broader perspective on the education of communities in the context of decentralized mini-grid projects, the role of LEWA cannot be understated. As a regulator, LEWA contributes towards better informed and active beneficiaries. This is critical for a democratic energy agenda. In light of this role, LEWA explained that their community engagement and education are presented in this manner;

> *"We created LEWA district committees in each district. The representatives in these committees are customers for each district from various sections of the community. This is how we try to engage our communities. We make use of this committee to spread information about what LEWA is and what services it offers. This is also useful in case of small manageable complaints which they are allowed to address the community and we just help with what are the basic things that they can help people with."*

One will note as previously mentioned in this thesis that one of the main objectives of energy democracy is to institutionally create an environment where the energy consumer evolves from

a passive state to an active one. LEWA's efforts in informing and updating the communities about their existing work encourage them to utilize the regulator when the need arises in their engagements with other project stakeholders therefore empowering the host community to exercise the energy citizenship role and responsibility in the proposed decentralized energy systems. While the District Committees are observed as a positive initiative that contributes to the actualizing the energy democracy agenda, the policy brief by Kali and Tsoeu-Ntokoane, (2024) argues that the state of their operations needs further refining in terms of their advisory support framework for both centralized and decentralized energy systems.

4.3.3 Design and Development Phase

In the second phase of the project life cycle, the design and development phase, the study identified the dominant practices being the village representative selection and the license application procedure. Regarding the Motete mini-grid project, an interview with the technical developer representative from MOSCET outlined how they approached the village representation:

> *"So we concluded it was in the best interest of the project to utilize the already existing village committees that have led other community projects like the sale of potatoes and the like. On this basis, we assumed the village committee has solidified itself in the community and the community trusts them and they have displayed many forms of unity. With this reference, it becomes easy to entrust the committee to fairly represent the community in any projects that have to do with the village community."*

Findings based on the Motete community engagement report (2021) describe the committee selection to be contrary to the respondent's statement. However, the findings demonstrate a lack of coherence in how the committees were formed which may imply a lack of synergy within the development team of the Motete mini-grid project. While this does not nullify the effectiveness of the overall approach to forming the community representation, this incoherence is still worth noting as it could be regarded as a reflection of other shortcomings in the project's life-cycle. The report explains the process being carried out based on the template provided by Gram Oorja, where the voting was done at a public gathering independently from the developers. The criteria stated that the committee had to comprise an odd number and also prioritize the representation of women and youth, especially in the top positions. This approach does not only speak on affording the host beneficiaries the agency and sovereignty to elect their representatives but also satisfies the element of inclusion in decisionmaking by prescribing diverse demographics as a requirement for the village community members.

The findings from the ERC interview show the whole community would address any activities required of them as beneficiaries in the inception and planning phase. In the design and development phase, however, the committee became an active point of engagement within the community. This approach aligns with the overall objective of the energy democracy agenda where the host beneficiaries are afforded the independence to choose representation which then becomes recognized in a project setting. This approach speaks of the beneficiaries' empowerment, although not to its full potential. A study by Wahlund and Palm, (2022) highlights that the collective institutional forms of participation in decentralized systems as one of the defining features of the energy democracy agenda which builds on the individual notions of material participation that energy citizenship underscores in its conceptual foundation. This outlook supports the study's argument that for the village committee to fully satisfy the energy democracy agenda and to completely exercise the empowerment the committee is founded on, their influence on decision-making should be extended beyond the project setting into an institutional setting of government and the regulatory body.

With regards to the Ha Makebe mini-grid project, the respondent was asked about the selection of the village representative and simply responded:

> *"They choose the committee. Ours is to give them the required number."*

Based on the report by LEWA on OnePower's license application, the village committee membership for the Ha Makebe mini-grid project was not comprised strictly of representatives from the community but extended to the local community council members and the residing chief. All in all, both the Motete and Ha Makebe case studies, demonstrate a strong inclination towards the energy democracy agenda in the practice of village committee selection but leave room for contestation in terms of whether the village committee is afforded extensive sovereignty that enables it to exhaust its potential in realizing the energy democracy agenda beyond the project setting. However, this proves to be more complex in terms of the licensing process as discussed below. Licensing involves a legal procedure that comprises contributions from LEWA, the Department of Energy, the respective developers, and to a certain extent, LEC. We discuss this process firstly, from the regulatory perspective. LEWA states that;

> *"We have compiled license application rules but unfortunately, they are a bit on the generic side, they do not specify whether or not they are for mini-grids or gridconnected or whatever the case may be. They are just generic in that they just stipulate according to whether you are applying for generation, transmission, or distribution supply for electricity."*

This research argues that the generic nature of these application rules potentially contributes to the failure of legislation to address the nuances of mini-grid plants, especially those that are decentralized. This state of legislation may offer loopholes for developers that can be used for the advancement of their profit-motivated mandates while overshadowing the contextual development needs of the host community as expressed by that said community. This can indirectly compromise the sustainability of the said decentralized mini-grid project as the license application process presents a limitation in the community's ability to be active in holding the developers accountable. Instead, this generic or vague legislation has the potential to disempower the host beneficiaries in decision-making processes.

According to LEWA's licensing rules and guidelines as issued in a Government Gazette in June 2012, several documents should accompany an application including, a financial information report, a technical information report, a concession agreement, and an ESIA report. The contents of the ESIA report directly fall under scrutiny in this discussion as they form part of the outlined requirements for the license application. The ESIA report by OnePower for Ha Makebe includes a section titled; Social Interaction for the Project Development, which describes the standard operating procedure for conducting surveys to better understand the community's socioeconomic conditions and potential risks and concerns. It is then important to note that in this section of the abovementioned report, the only mention of the community is in the case where the report is concerned with the demographics of the community, the economic conditions and basic aspirations of the community, and the community concerns that are centred around land use, water availability, emissions, hazardous materials, safety, property damage, fire, personal injury, health and social effects of which the respondents are asked to rank in terms of importance. In line with energy democracy, the contents of the EISA show that its approach empowers the beneficiaries as demonstrated by the opportunity to rank their concerns according to level of importance, but in the same breath, the same account deviates from the overall energy democracy agenda by exclusively predetermining what the community should deem as concerns without in-depth consultation.

According to LEWA interview (2024), the regulations are fixed for every mini-grid development and they apply to all relevant parties who are interested in initiating projects of this nature. The respondent explains that their main focus is to oversee the developer and to ensure that the developer provides the community with the required services as agreed upon during the issuing of a license. The respondent also highlighted that the terms of license issuing tend to touch on the social aspects but not with the same rigour as compared to the technical and financial deliverables. The findings also mention that the only link LEWA has with the community during this phase of the project is when, as part of the regulation requirements, it

has to engage with the said community to check if they have been briefed sufficiently, engaged accordingly, and lawfully, and whether or not they are on board with the development of the proposed project. This is the only direct link and beyond that, LEWA only comes across the community when mentioned in the concession agreement and the ESIA documents, during the evaluation process that forms part of the licensing requirements. In an interview with a respondent from the Department of Energy, they highlighted that:

> *"Yes, we make sure things are done as they should be especially because we are the advocates of the public. For any mediation matters that have to do with the public, we are there as the community advocates. We also make sure that their rights are not abused by the powers that be."*

The concession agreement is a contractual agreement between the developer and the government of Lesotho as the lawfully designated advocate for the community. Within the concession agreement for the Ha Makebe mini-grid project, the terms of the agreement focus mainly on ensuring reliable access to electricity for the customers, and the only direct mention of the community is in the conditions precedent and article 21 of disputes between customers and concessionaire. The conditions precedent highlights that there has to be a memorandum of understanding with the concerned community to the reasonable satisfaction of MEM while under article 21 the agreement explains that any disputes between the customers and concessionaire shall be submitted first to a conciliation commission established where necessary by the community council which should be composed of duly appointed representatives from the community. It further states that failure to resolve in the above setting, the matter is then referred to the LEWA licensing conditions.

The ESIA and Concession Agreement document for Ha Makebe along with the abovementioned processes by LEWA in the process of licensing, have been used here to provide a basis from which energy democracy can be traced. Based on that information, it is apparent that how the beneficiaries are involved does not necessarily give them the agency to participate in the process. They seem to be engaged not as primary stakeholders but as recipients. This state of LEWA processes seems to lack in terms of its ability to empower host beneficiaries to exercise their energy citizenship under the energy democracy agenda. In other words, the licensing process falls short in terms of inclusivity and in broadening forms of community participation.

4.3.4 The Build and Commission Phase

In the third phase of the project life cycle, the build and commission phase, we look into the recruitment, and project evaluation and approval approaches in relation to the energy

democracy principles. In an interview with the OnePower respondent on the Ha Makebe minigrid project, when asked about their approach to the recruitment process, they explained that:

> *"…Before we hire people we approach the committee and let them know what kind of people we need, and how they going to get paid, the rules of engagement are as follows, so forth and so forth. After sensitizing the committee about our hiring intentions we call a community gathering and let them know what they should expect during the hiring process. Then we give the committee the green light to hire people.*

When investigating the recruitment process of the Motete mini-grid project, the respondent from the ERC highlights a similar approach to that of Ha Makebe and mentions that:

> *"…our approach is to give that responsibility to the village committee, to call a community gathering and let them know about the upcoming processes to recruit labourers for unskilled, semi-skilled, and skilled. The committee uses their discretion on who they decide to recruit."*

In both case studies of Ha Makebe and Motete, the recruitment approach in the third phase of the project life cycle is seen to be in accord with the energy democracy agenda. This approach where the developer stipulates the skill requirements and then leaves the responsibility of hiring relevant personnel entirely to the community through their committees, directly empowers the beneficiaries and allows for a fair inclusion of the community in the project deployment and recruitment decision-making. However, when we investigate the evaluation and approval process, traces of energy democracy principles seem to yet again be lacking. To ensure that the project's operation is up to standard and meets the technical design and specification, there is a need for an evaluation and approval process under the standard practice of commissioning which is guided by the relevant regulations and standards (Annecke, 2008). Based on OnePower's EISA and the respondent interview on the Ha Makebe project, the commissioning of the project reticulation network was done in-house and reviewed by LEC, while the generation plant commissioning was also in-house with the external reviewer being the equipment manufacturer. Based on the above findings, it is worth noting that the standard evaluation and approval of the project as it stands focuses solely on the technical functionality of the facility which does not factor in the socio-political functionality, where the project meets the community. This approach therefore side lines members of the community from the review process, which based on the energy democracy concept demonstrates the exclusion of the community in the review and decision-making of the overall functionality of the project. This exclusion further contributes to the disempowerment of the host beneficiaries by not having a stake in the approval decision-making process of the project. The findings on the Motete project

concerning the commissioning process can be deemed rather unorthodox due to their unusual circumstances. In the interview with the ERC respondent, he said of the commissioning phase of the project that:

> *"After installation, I would say we commissioned ourselves"*

They further confirmed that:

> *"But in terms of the standard way of commissioning, the system is not yet commissioned. But still, that being the case, the system is running and the Department of Energy is compelled to visit the site and investigate since they are aware of this. At the same time, LEWA also visits the site to investigate because it also became aware that the system is running."*

The ERC respondent highlighted that the terms and conditions of the grant required an accelerated commission process and failure to deliver meant the forfeit of such a grant. This condition conflicted with the timing of the legal due processes stipulated by the regulator hence the existing situation where they necessitated to commission themselves without an external reviewer. The research observes that while there is an obvious disconnect between the financier conditions and the regulation practice linked to project commissioning when scrutinizing this prevailing situation from an energy democracy perspective, it can be seen that the standard practice of evaluation and approval of decentralized mini-grid projects prioritizes the financier and regulator mandates over the direct potential impact the mini-grid facility may on the livelihoods of the host community on the ground. This lack of prioritization of the host communities compromises the ability of the community to broadly participate and be included in the project deployment and decision-making processes in support of the energy democracy agenda.

4.3.5 Operation and Maintenance Phase

In the operation and maintenance phase of the project life cycle, the study looks into the approach of reporting and monitoring mechanisms from an energy democracy point of view. Reporting and monitoring are key for the success of any project as it is a practice that ensures that the implementation and operation of the project do not fall out of the primary objectives that were established during the inception and planning phase (Annecke, 2008). This section begins by discussing the findings of Ha Makebe mini-grid development. Based on the relevance of the contents of the Ha Makebe ESIA, research steers the discussion towards the Environmental and Social Management Plan (ESMP) that highlights the proposed mitigation, and monitoring measures to be undertaken during the implementation and operation of the project to either eliminate, offset, or reduce adverse environmental and social risks and impacts.

Within the ESMP section, there is an outline of procedures and resources for monitoring, documenting, and reporting the project conditions to ensure the effectiveness of the mitigation and management practices. These procedures and resources are tailor-made to fit the sitespecific project conditions where weekly inspection and monitoring forms will be filled out and reviewed by the appointed environmental officer. The tracked conditions and the applied mitigation measures focus mainly on the environmental impact perspective of the site while the social impact aspect is given minimal attention. The only mention of the social considerations in the ESMP is under the note that the ESMP training records for on-site staff have to be reviewed at least monthly or upon the arrival of new labourers. The section further directs that the grievance registry will be categorized, and investigated and resolution determined at least daily. The ESIA further puts forward that it will publicly avail easily accessible channels for stakeholders to make contact and will maintain ongoing communication throughout the construction and operation of the mini-grid. Additionally, the ESMP will set forth procedures for receiving, registering, and validating all external communications and requests for information or action, as well as objective methods for screening and assessing the importance of issues raised while all external communications and grievances received will be documented and the responses and resolutions published.

Based on the previously highlighted standard approach of monitoring and reporting described in the ESIA, it is seen to enable the community to continuously have a platform to actively contribute to the monitoring of day-to-day activities concerning the community participants and therefore broadening the forms of participation by the host community through transparent and accessible mechanisms. However, the study observes that the efforts of monitoring and reporting are limited to the infrastructure installation’s risks and impacts and excludes provisions on reporting and monitoring the energy and sustainable development nexus brought by a project of this nature, a key area worth noting as highlighted by Pan et al., (2023). At its core, this reporting and monitoring will visualize the project's impact on the society’s development and offset the community’s agency and sovereignty as energy citizens in providing relevant local dimensions in their feedback on the matter of electricity and development nexus (Suri, 2020).

Additionally, in an interview with one of OnePower's respondents, it was described that as part of the project monitoring process, they hire the local people who assume the position of first response in case of a fault in the system. This further aligns with the energy democracy agenda in that this form of monitoring mechanism contributes to the empowerment of the host community. The distinct approach by the Ha Makebe developers on monitoring and reporting

is mostly informed by the fact that its project governance model is a private one which is significantly different from the governance model used at the Motete mini-grid project.

In an interview with the technical developer from the Motete mini-grid development, when asked about the approach they used in reporting and monitoring their response was:

> *"A community gathering will be organized and we will be summoned to address such questions with the other project developers. Even in cases where the questions are addressed in meetings set up internally, we would still go to the community gatherings to respond to the community questions and issues that may need to be addressed."*

The Motete mini-grid project governance model was community-oriented. All the internal reporting and monitoring was done through community gatherings and the responsibility of disseminating information was mostly of the village committee. This approach is also seen to align with the energy democracy approach in that there is a high level of inclusion because of the community gatherings that act as reporting platforms. The community is therefore empowered as they are constantly engaged and assume the complete role of monitoring and reporting. Ethical monitoring and inclusive reporting are directly linked to transparency and accountability in infrastructure development projects (Annecke, 2008). In light of this, the Department of Energy as part of the government administration in project development further highlighted that:

> *"When there is a problem on the ground, the community counselor has to contact the Department of Energy."*

The local council is designated as an official channel for reporting the community's project inputs to the Department of Energy. This direct channel of the community to report to the government through the council further builds on the democratic agenda where the community feels empowered and included by creating an environment that allows them to exercise their energy citizenship right to report their contributions and concerns. According to the DoE respondent, during the early stages of the Ha Makebe project before its commissioning, there were monthly reports submitted to the Department of Energy but since the operation, the submission of project status reports has been irregular with significant time lags. This irregularity is seen as a dent in the overall project's ability to be transparent and hold the developers accountable which the reporting mechanism is meant to uphold, and therefore compromising the sustainability of the project.

Another major contributor to the monitoring and reporting practice in Lesotho mini-grid decentralized projects is the designated regulator which is LEWA. However, most of the required progress status reporting by LEWA solely focuses on the technical functionality of the

project. The respondent from LEWA during an interview mentioned that there is no formal link between them and the project host communities. The entity was founded on regulating the developers of electricity projects relying solely on the information the Developer presents during the quarterly reports and the occasional site visits. Based on these findings, it is important to note that the host beneficiaries are not accounted for in LEWA reporting requirements and the developer's reports are audited against the project's technical functionality alone which by default excludes that community as participants in the compilation of such reports. In an interview with LEWA, the respondent further highlighted that the only channel of reporting from the community is on an individual basis where a community member can visit their offices and relay their challenges concerning the project. The respondent further added that:

> *"It should not happen that as soon as they encounter issues they come to us without engaging with OnePower to attempt to address such pertinent issues. But if they can't resolve it together then that is when they can consider coming to us."*

The respondent from LEWA highlighted that their mandate in the operation and maintenance phase of mini-grid projects is to perform inspections on facilities to make sure they meet the technical performance standard for as long as the project exists and is functional. Regarding the above findings, it can be seen that LEWA's mandate prioritizes the developer's input over that of the community because its primary focus is on the technical functionality of the project. This approach by LEWA speaks on the potential disempowerment of the beneficiaries where the community members may interpret this as their concerns being invalid or less of, making them less eager or confident to actively contribute to the overall sustainability of the project in their capacity as energy citizens.

4.4 Energy citizenship status under the energy democracy agenda in decentralized mini-grid Project development

4.4.1 Introduction

The energy research that connects social science and political theory presents that for the energy democracy agenda to be actualized, the concept of energy citizenship must co-exist concurrently with it, where the element of citizenship plays the role of endorsing and legitimizing the democratic governance of the proposed energy systems (Van Veelen and Van Der Horst, 2018). It is therefore binding for the current paper to extend its research towards investigating the energy citizenship status of the host communities under the discourse of energy democracy. Becker and Naumann, (2017) note that the current structure of centralized energy systems does not afford its users the power and agency to actively contribute to its

sustainability. This section seeks to investigate whether the alternative structure of a decentralized energy system offers the latter for the end users. The data collection design was then based on the ideology that energy citizens in energy democracy are active participants who are positively enthusiastic about energy innovations as opposed to being indifferent, educated about the developmental implication of such energy systems, and are willing to institutionally engage with the deployment of such systems to bridge and shape the technological change that addresses the contextual setting of the host community (Laakso et al., 2023). A questionnaire was devised and directed to the host communities in the existing mini-grid projects found in Motete and Ha Makebe under the themes of energy usage and awareness, agency in energy governance, and general perception of community ownership. This was done to evaluate the energy citizenship status of the host communities and their potential enrolment and activism in enabling the functionality of the concept of energy democracy in the development of decentralized mini-grids in Lesotho.

4.4.2 Energy usage and awareness

As observed in Figure 3, it is seen that overall there is an evenly distributed proportion of the community population in terms of the level of understanding of energy sources and their impact on social development for both case studies of Motete and Ha Makebe. The results of Figure 4 show that for both communities, the majority of the respondents seem to have displayed an eager attitude to initiate the acquiring of project information about the proposed mini-grid projects. When the communities were asked about their level of participation in initiatives in line with energy conversation, based on Figure 5, it is seen that the Ha Makebe community was highly active in this regard when compared with the Motete community. In evaluating the level of penetration in terms of community education about the roles and responsibilities of each stakeholder within the project, as demonstrated in Figure 6, the Majority of the Motete community expressed that the efforts attempted were not sufficient while the Ha Makebe community felt that in their case the efforts were satisfactory with some room for improvement.

Lastly, the results as denoted in Figure 7 deduced that in both case studies, the communities were not knowledgeable about the project life cycle phases and their distinct roles in each phase of the project. The analysis of the results combined demonstrates an imbalance in energy understanding may contribute to time-consuming decision-making processes because different levels of knowledge generally lead to a variation of complex views of sustainable development. The current state may prove discouraging for community members who are eager and have demonstrated a vested interest in exercising their energy citizenship and, therefore exist as a barrier for actualizing the energy democracy agenda. This state of energy citizenship in decentralized mini-grids in Lesotho speaks on the project development to prioritize the

education processes to accelerate and ensure the sustainability of decentralized mini-grids (Terrapon-Pfaff et al., 2018).

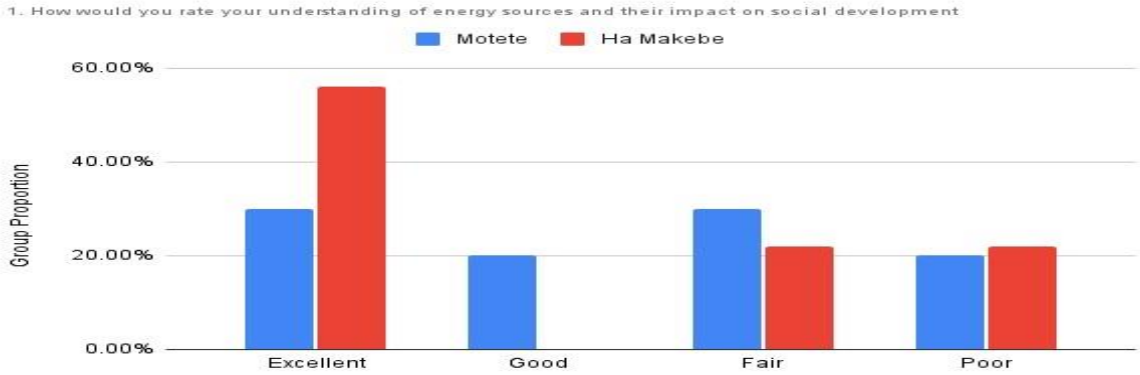

Figure 3: Energy Usage and Awareness Results

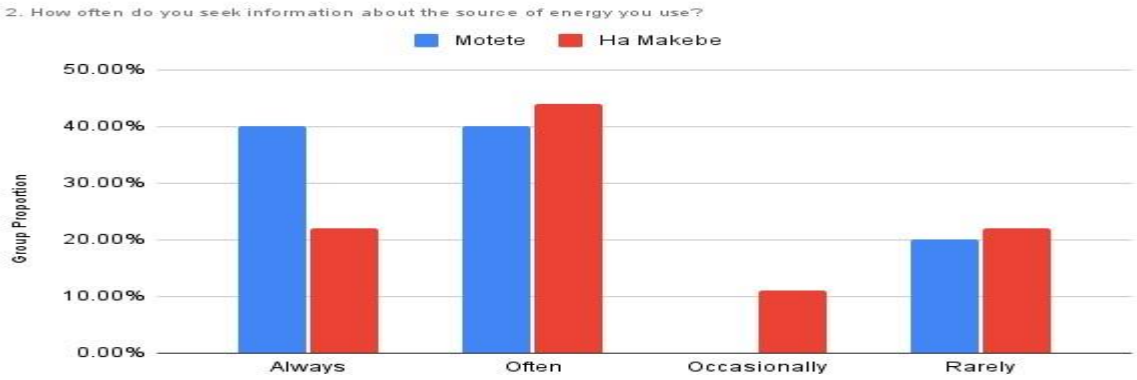

Figure 4: Energy Usage and Awareness Results

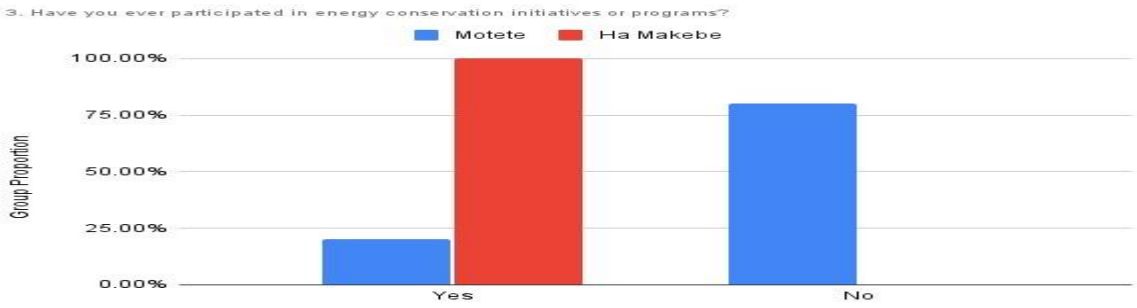

Figure 5: Energy Usage and Awareness Results

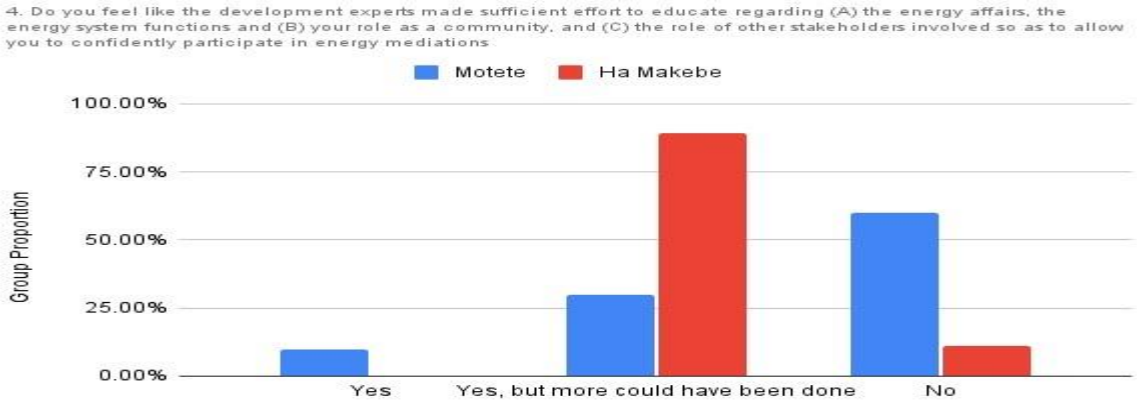

Figure 6: Energy Usage and Awareness Results

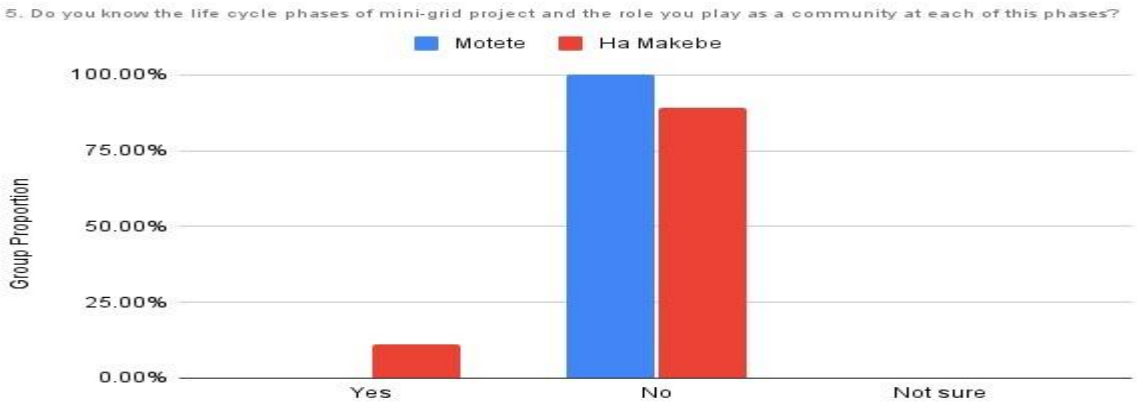

Figure 7: Energy Usage and Awareness Results

4.4.3 Agency in Energy Governance

In interrogating the host community's agency in energy governance, Figure 8 shows that from both case studies of Motete and Ha Makebe, all the host community respondents demonstrate a heightened interest in being actively involved in the decision-making of the development processes of the mini-grids. Figure 9 further builds on the above findings, and shows that the majority of the host community has participated in the community meetings held concerning the proposed mini-grid however the Motete community showed more commitment to attendance than those of the Ha Makebe project. The findings based on Figure 10 communicate a positive reception by both communities on the committees as a form of representation in project deliberations and activities. In evaluating the community's ability to independently propose initiatives that foster and facilitate their activism in project decision-making, it was found that a greater proportion of the community for both Motete and Ha Makebe had instigated such initiatives with a fraction of them showing no interest. In addition, the communities of Motete and Ha Makebe revealed that the decision-making process of the project had fairly considered their existing traditional ways and their sociocultural state with a few community outliers as displayed in Figure 12.

Lastly on this agenda of community agency, on the question of whether the communities had independently organized themselves to hold the expert stakeholders accountable and responsible for the project's impact on their rights and well-being, the response indicated that no such an initiative was done based for both the Motete and Ha Makebe community as indicated on Figure 13. The overall interpretation of the results is that the host communities have a heightened interest in partaking in the development decision-making process with the majority availing themselves for community meetings which speaks on the community agency. Additionally, it is seen that there is a consensus to support the village committee as their representatives in the project development which speaks on the collectiveness attitude of the community as an essential element for the energy democracy agenda (Laakso et al., 2023).

While results show the community's ability to initiate energy-affiliated activities in the name of agency and activism, it was seen that they failed to see the need to organize to be legally recognized in the case that they need to hold other stakeholders accountable. This state of citizenship speaks to the legal framework lacking in the aspect of encouraging social activism and facilitating community agency in the development of energy projects and therefore becomes a barrier to active energy citizenship (Bukari et al., 2021).

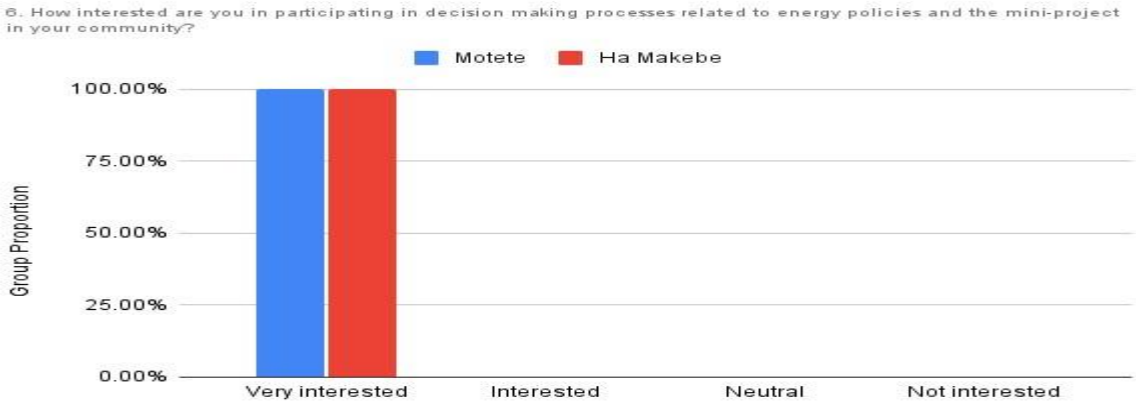

Figure 8: Agency in Energy Governance results

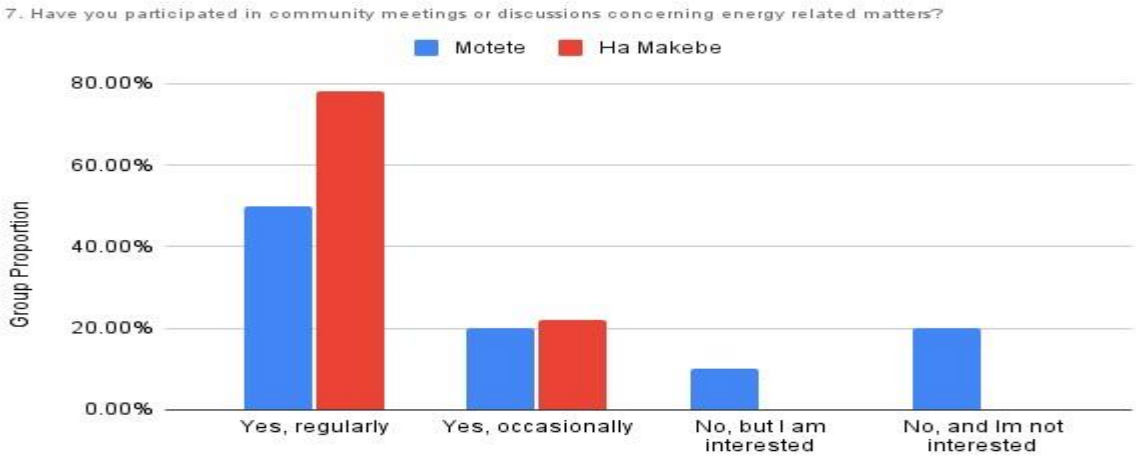

Figure 9: Agency in Energy Governance results

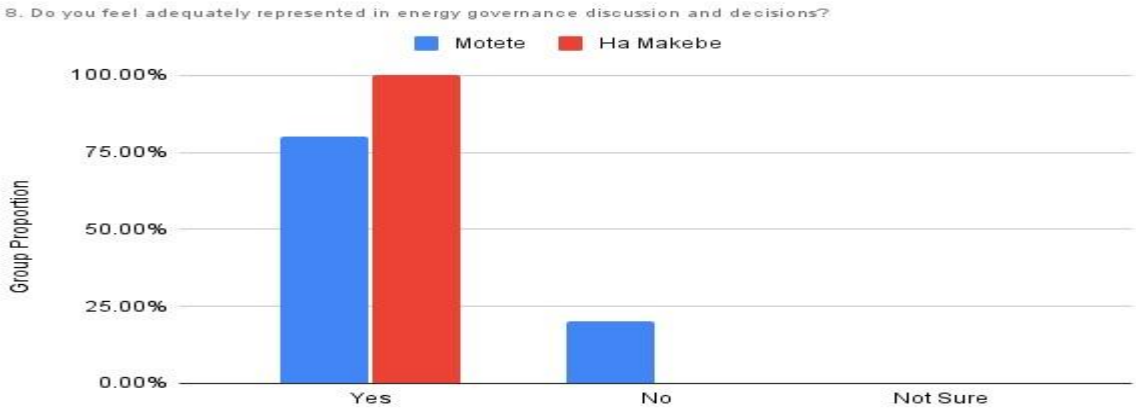

Figure 10: Agency in Energy Governance results

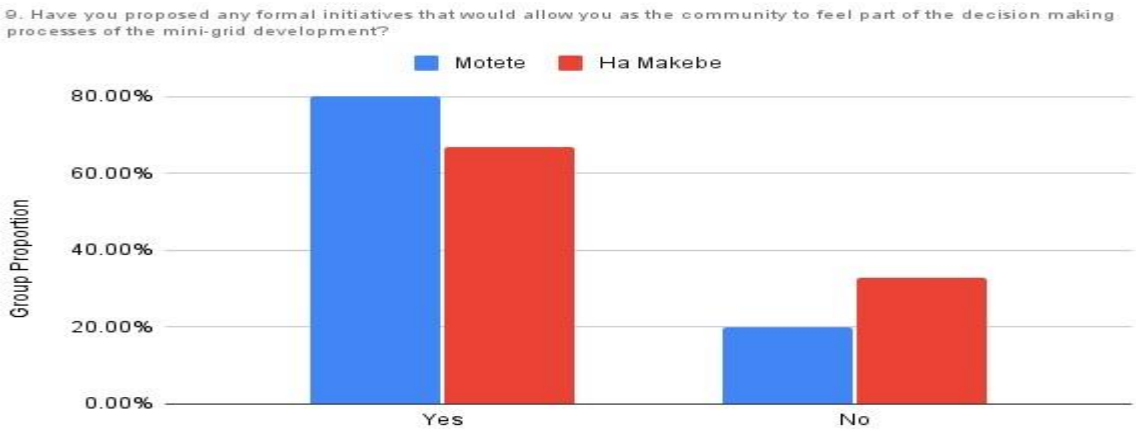

Figure 11: Agency in Energy Governance results

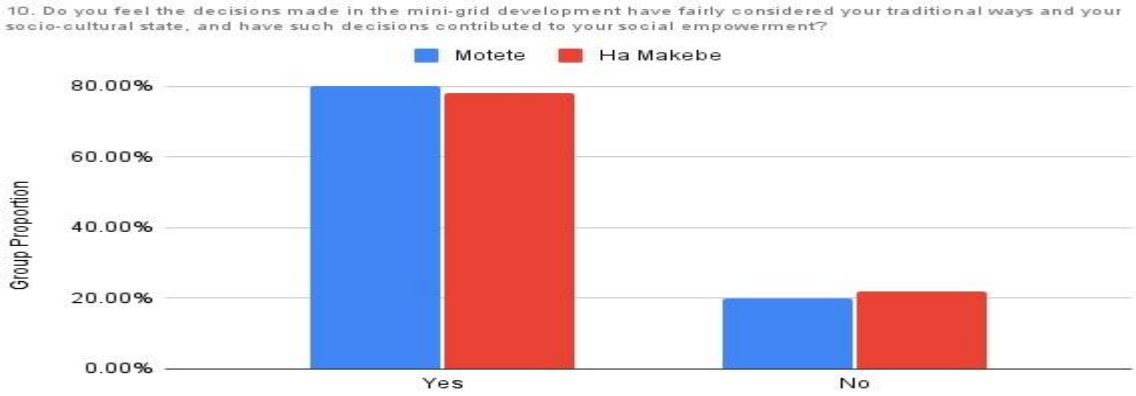

Figure 12: Agency in Energy Governance results

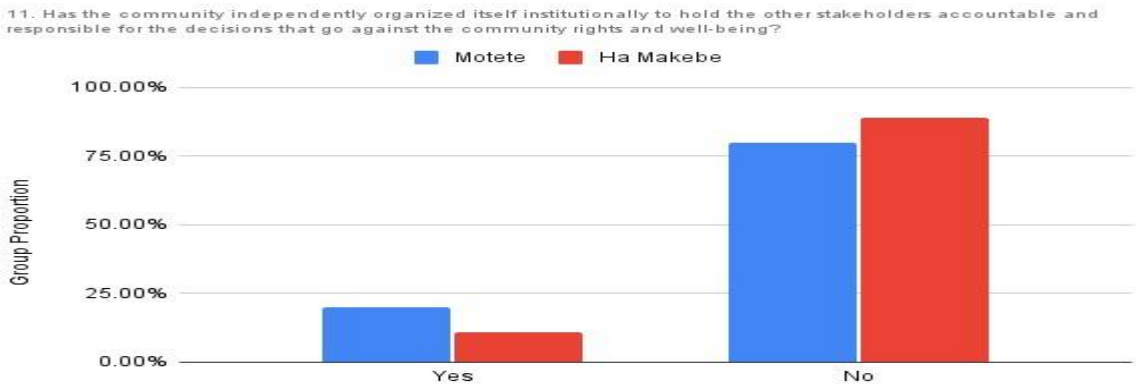

Figure 13: Agency in Energy Governance results

4.4.4 The general perception of community ownership of energy projects

The focus of this section is the general assessment of the host community's perception and opinion on energy ownership in energy projects based on their experience with the mini-grid projects. Findings communicated by Figure 14 show the popular opinion of all community respondents in both the Motete and Ha Makebe cases that energy consumers need to have a say

in energy-related decisions. Figure 15 shows results obtained in the continued assessment of the host community on whether through their experience they are for public access to project information and the response was unanimous in its advocacy for both case studies of Motete and Ha Makebe. The findings conveyed in Figure 16 speak on whether, based on the respondents' experience, the decision-making processes were found to be transparent and inclusive. The majority of the Ha Makebe community expressed their experience in the decision-making process as being transparent and inclusive while the larger proportion of the Motete community respondents demonstrated their experience as having lacked such quality of transparency and inclusivity. When the respondents were asked whether they support the notion that the community should own the energy resources and infrastructure for such decentralized energy projects, their response was unanimous in expressing strong support for such an idea for both the Motete and Ha Makebe communities as presented in Figure 17.

In addition, the results from Figure 18 put forward that the majority of the respondents from both the Motete and Ha Makebe communities are in favour of the energy consumers having a meaningful role in holding the energy providers accountable for adverse actions that may arise and be in conflict with their rights and well-being. The general interpretation of the results from this section presents that there is a consensus that a community-oriented governance and management structure for the sustainable development of mini-grids is favourable and ideal for the empowerment and inclusion of the community in the decision-making and deployment of decentralized mini-grid projects. This state of citizen perception speaks directly to the community members' willingness to assume the responsibilities that come with the local ownership aspect of energy projects under the energy democracy agenda which has a causal effect on prioritizing active energy citizenship (Van Veelen and Van Der Horst, 2018).

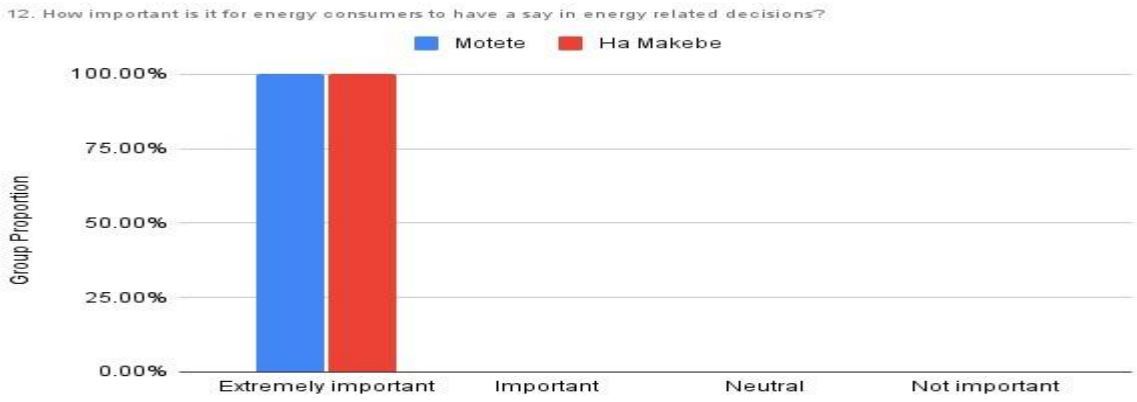

Figure 14: The general perception of community ownership of energy projects results

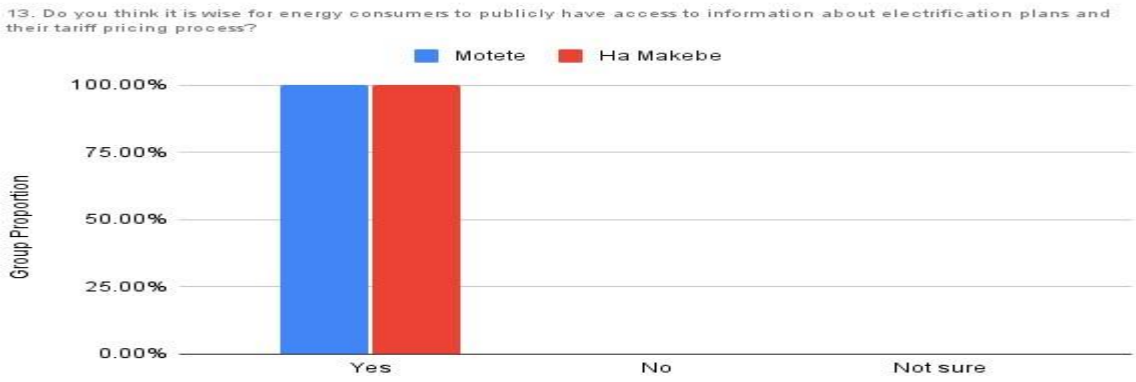

Figure 15: The general perception of community ownership of energy projects results

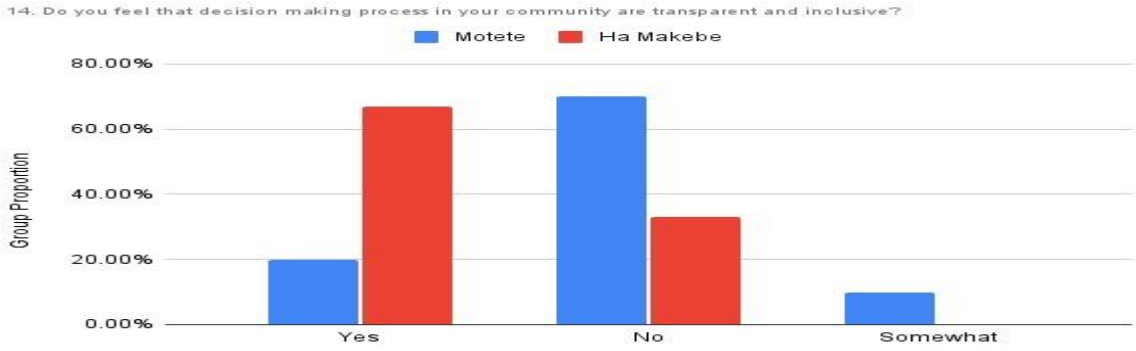

Figure 16: The general perception of community ownership of energy projects results

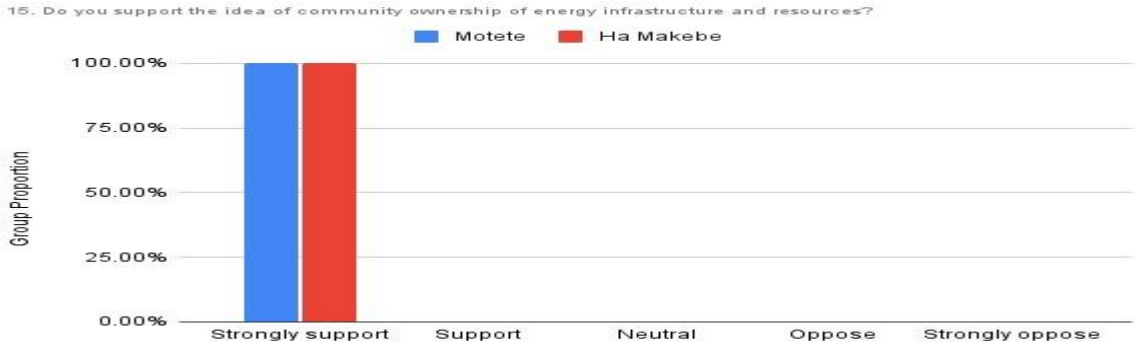

Figure 17: The general perception of community ownership of energy projects results

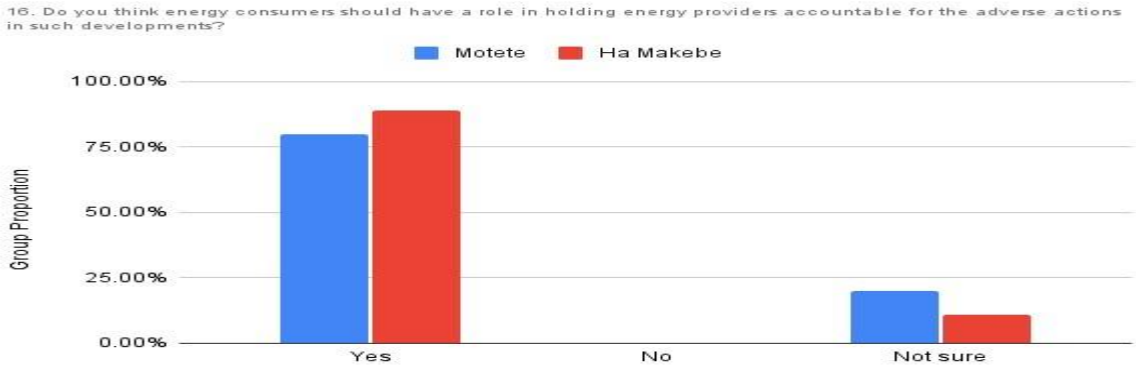

Figure 18: The general perception of community ownership of energy projects results

CHAPTER 5: Conclusion and Future Considerations

5.1 Introduction

Sustainable energy technologies require sustainable governance structures and practices that are guided by socio-politically conscious policy and regulatory frameworks to achieve sustainable development for decentralized energy systems. In this research, the researcher has employed a life-cycle approach in tracing the main principles of energy democracy as a sociopolitical governance framework in two recently developed mini-grid projects in rural Lesotho, the Motete and Ha Makebe Mini-grids. This study has endeavoured to redirect Lesotho's energy research focus toward energy democracy to make a case for the potential gaps in institutional governance structures and practices in the context of Lesotho's evolving decentralized energy landscape. The rationale for evaluating the presence of energy democracy for this study is that the socio-political aspects of the energy transition are becoming more and more prevalent in guaranteeing the sustainable development of decentralized energy systems in Lesotho, and indeed in the global community at large (Tsoeu-Ntokoane et al., 2024, 2023).

5.2 Conclusion remark: National strategies, Policy and Legal Framework in the Energy sector of Lesotho

The findings of this research study present that the existing legal and national initiatives frameworks in Lesotho recognize the importance of extensive consultation that informs project recommendations during decision-making, the need to increase local participation and inclusion in project development, consumer education, and the establishment of village committees as representatives in energy development. This approach is seen as the first step in the right direction but still falls short of actualizing the energy democracy agenda. This is owed to the fact that even if key concepts are included in the framework compilation, they lack specification and explicitness which speaks to the impracticality of their application in a project and institutional setting. In addition, without the establishment of detailed blueprint mandates on these key issues, transparency and accountability are likely to be compromised. Legal frameworks thrive on specification and detail, making the existing frameworks vulnerable to corporate institution abuse that aims to serve its profit-motivated needs as opposed to adding value to the development of the host society at large. The frameworks are also seen not to afford the beneficiaries the agency and sovereignty in final decision-making as this solely rests on the government and the regulating body. Another important note from the findings is the lack of accurate representation of nuanced social data by the use of dormant national census data of 2016 that is used to design and plan energy systems. This data is considered limiting in accurately representing the actual situation on the ground to be used as a reference for national energy plans.

The existing policy, regulations, and initiatives in Lesotho's energy sector are centered on the stakeholder theory mentioned by Dwivedi and Dwivedi, (2021) which speaks to improve the infrastructure development aspect of the project management agenda that does not pick up on the nuances that the energy democracy agenda addresses as a socio-political concept. The stakeholder theory focuses on exercising the responsibility of project optimization on the infrastructure aspect which, unlike the energy democracy concept, excludes the institutional optimization that energy projects exist in that speaks to contribute to the overall project sustainability of decentralized energy systems. Eales et al., (2018) support this notion by highlighting that to date, the key stakeholders have over time extensively focused on the reduction of technological and economic barriers to the deployment of mini-grid projects but have lacked an understanding of the social impacts of mini-grids which require resourceintensive data collection methods that are generally perceived as costly and time-consuming.

While it is apparent that research continues to demonstrate the importance of measurable normative agendas in the deployment of sustainable energy systems, the statement speaks on the growing need for future research to establish how to measure the social impacts of minigrids to evaluate their effectiveness as sustainable developments.

5.3 Conclusion remark: Standard Institutional Practices in Decentralized Mini-grid Project Development Lesotho

5.3.1 Summary Overview

In the study's effort to trace the formulation and governance approaches that informed the existing project standard practices with reference to the energy democracy agenda in the development of decentralized mini-grids in Lesotho using the case studies of Motete mini-grid in Butha Buthe and Ha Makebe mini-grid in Berea, the findings are summarized in Table 1. The identified the standard practices are presented along with their main results and corresponding discussion remarks.

Table 1: Summary Overview

Standard practice	*Main Findings*	*Main discussion Remarks/Implication on energy's overall sustainability*

Village selection	The study found that the selection process/ survey scope prioritizes the collection of data based on testing the financial viability over other project objectives of the candidate village. The study found that the analysis and final decision for village selection rests on the discretion of the developer.	Leads to a limited scope of the selection criteria that may deter the project from actualizing its sustainable development objective. This approach stifles the role of the beneficiaries as energy citizens to assume the role of passive consumers with their contribution limited to economic status. This takes away the possibility for the communities to offset and participate in developmental strategies that the energy system seeks to enable as its fundamental objective.
	The study found that the village selection approach is consultant-based rather than participatory.	This speaks on community engagement and its support but it is void of community inclusivity and empowerment in the deployment and decision-making of decentralized mini-grid development.
Education	The study found that the education approach used focuses on the awareness and sensitization aspect about the need for development as well as the system's most basic functions.	It therefore does not exhaust completely the educative objective by going beyond the basic engagement with the community that will foster informed and active contributive engagement that can hold other stakeholders accountable as well as empower them as the host community.

Village representative selection	The study found that the village committee is recognized as the direct representative body for the community and the members are elected independently by the whole community. The committee selection prioritizes the diversification and inclusion of minorities.	The approach in which the village committee is formed as well as what it represents as a body speaks on the empowerment and inclusion of the beneficiaries within the deployment and decision-making of the development mini-grid project. This overall, to a certain extent, satisfies the energy democracy agenda. The study argues that for this body to be fully active as a vehicle for the energy democracy agenda, its jurisdiction and authority have to be recognized beyond the project setting and integrated into an institutional environment to contribute to the sustainable development of decentralized mini-grids.
License Application	The study found that the regulator documents and makes available to the public all the requirements	While the regulator's approach in making all documentation accessible to the public speaks to transparency as one of the key supporting principles of energy democracy,

	and rules to follow for a license application.	this efforts are countered by the generic nature of the rules and regulations, a characteristic that potentially hinders the effectiveness of the legal framework on the development of decentralized mini-grids. The generic character of the rules and regulations of license application requirements contributes to the failure of the legal framework to institutionally activate and position the beneficiaries such that they are afforded the agency and sovereignty to exercise their energy citizenship, to hold other stakeholders accountable in the deployment and decision-making processes concerning the sustainable development of decentralized mini-grids.
Recruitment	The study found that the recruitment process is such that the developer stipulates the labour quantity and skill requirements and the responsibility of locating and hiring such personnel rests on the community through the village committee.	This approach was found to be in alignment with the energy democracy agenda as it empowers the beneficiaries by affording them the sovereignty to make the necessary recruitment within their community. This also speaks to the community's ability to exercise fair inclusion in the recruitment processes as they see fit.
Evaluation and Approval	The study found that the standard practice of commissioning particularly deals with the evaluation and approval of the system's technical design	As it exists, this practice of evaluation and approval speaks on the testing of the System's technical functionality in isolation from the functionality of other project objectives beyond electricity access. This approach by default excludes members of the community

	and specification. This evaluation is either done independently by the developer or an external reviewer, in most cases being the National utility company or the equipment manufacturer.	from the project review process. This exclusion speaks of the disempowerment of the community by not having a stake in the approval decision-making process and therefore going against the energy democracy agenda. The system optimization is isolated from the project optimization which then compromises the overall sustainability of the project. The beneficiaries as stakeholders need to contribute to the project review as a measure to ensure project sustainability.
Reporting and Monitoring	The study found that the ESIA is the blueprint used to prescribe the protocol for monitoring and reporting and dictate what qualifies for project monitoring. The ESIA focuses on monitoring environmental and social risks and impacts during the implementation and operation of the decentralized energy system. The study found that the reporting and monitoring processes are legally reserved for the developer	It is observed that the developer's primary objectives determine what will be prioritized in the monitoring processes. The monitoring and reporting process primarily focuses on the infrastructure's risks and impact on the existing state of the environment and society. The monitoring processes make no provisions for observing the project beyond the infrastructure installation, on assessing the energy and sustainable development nexus (Pan et al., 2023). This approach speaks on assuming the project lens of viewing a decentralized mini-grid not just as infrastructure but as a project birthed from a sustainable development objective. There are no institutional provisions made for the host community to legally carry out the monitoring and reporting processes which take from the beneficiaries the agency and sovereignty to hold the developers

	by the government and the regulating body.	accountable by report cross-referencing and by default disempowers them as energy citizens.

In light of decentralized mini-grid projects being a relatively new approach to advance Lesotho's electrification, this paper further puts forward the potential considerations and thought process directions on the relevant and dominant practices at different phases of the project life cycle from an energy democracy discourse. These potential considerations are aimed at being critical in the upcoming energy policy design in the next year or so for projects similar to Ha Makebe and Motete to evolve from solely being sources of electricity access intended for productive use to being sustainable development infrastructures that promote sustainable use of energy. The sustainable use of energy is aimed at establishing energy infrastructure that is interconnected with the host communities' development prospects and prioritizes active citizen empowerment. Below, the research attempts to reflect in summation, on the overall legal and stakeholder future considerations based on the paper's findings as presented in the project life cycle phases.

5.3.2 Future consideration in Institutional practice of governance approaches

5.3.2.1 Future Considerations for the Inception and Planning Phase

This section of the thesis considers the viability and effectiveness of the current approach to information dissemination where it prioritizes the awareness aspect and lacks the educative aspect. For decentralized energy systems similar to the cases mentioned above that aimed at achieving just energy transition and sustainable use of energy, the educative approach is deemed as more appropriate as it equips the host beneficiaries with skills and knowledge to encourage citizens to exercise their rights and responsibility as opposed to the awareness approach which at best, facilitates the citizen basic understanding of the project's purpose for support of its implementation. Findings from Terrapon-Pfaff et al., (2018) demonstrate that access to sustainable energy does not automatically lead to productive activities, and it is but just one requirement that works complementary to others to contribute to the intended socioeconomic development. One of the complementary factors Terrapon-Pfaff et al., (2018) is education which is equated to capacity building which includes vocational training, information campaigns, electrification programs that are part and parcel of the business development services, and technical training.

As the complementary response to prioritizing an educative/capacity-building approach rather than an awareness-oriented approach, it is then important to redesign the village selection process in the inception and planning phase. The process redesign will need to be centered on a participatory and interactive approach that prioritizes the dynamic nature of energy citizenship rather than its static feature of status that the traditional surveying mechanisms pay attention to. Laakso et al., (2023) underscore the limitation presented by the traditional understanding of consumers solely as economic actors that are subject to the passive reception of energy services and on the same account highlight the sociological approach to consumption as an integral part of energy community customs that make it clear on what energy is used for. This further informs the need for an in-depth surveying mechanism that will inform the development needs of the community as a way to ensure the project's sustainability. The implementation of this form of surveying has time and financial implications that will need to be included in grant applications for projects similar to Motete or loan applications for cases similar to the Ha Makebe project.

5.3.2.2 Future Considerations for the Design and Development Phase

Bukari et al., (2021) discuss policy and regulation formulation being one of the main barriers to accelerating mini-grid deployment with some stakeholders highlighting the generalization feature of the policies being linked to rushed work and a knee-jerk reaction to "opportunistic developers". For decentralized mini-grid projects that aim to be sustainable developments, this policy formulation approach threatens the long-term functionality of these projects as it does not accommodate the citizens' dynamism to constantly change their habits and customs depending on the active development path they are involved in at that particular time which directly affects the uptake of productive use of energy (Laakso et al., 2023; Terrapon-Pfaff et al., 2018). Policymakers should ensure that decentralized mini-grid deployment evolves beyond technical and economic objectives by advancing aspects of social inclusion, social activism, and community agency that will create a democratic environment for energy citizens to contribute to the sustainable development of such projects that holds all stakeholders accountable in all possible variations of injustices.

5.3.2.3 Future Considerations for the Build and Commission Phase

The commissioning practice is a crucial process for the project quality assurance and to a certain extent in ensuring its sustainability. Eales et al., (2018) highlight the importance of understanding and measuring the nature of communities' interactions with mini-grids in the decision-making processes concerning the consideration of sustainable financial and

investment model alternatives. This speaks on evaluating the level of the community's contribution to the governance and management structures jointly with the technical performance aspect of the project as part of the criteria that determine whether the proposed energy system is considered a sustainable electrification project. This therefore means the project design and specifications should prioritize the community's role in ensuring a sustainable energy system with the same emphasis that is given to the technical aspect. In addition, the activation of this supplemented commission approach would require members of the community to be cast as part of the reviewing team which will, to a large extent, contribute to the inclusion and empowerment of the host beneficiaries in the decision-making of decentralized mini-grids. The scope of evaluation may need to evolve from a solely technical perspective and branch into an energy and development nexus evaluation strategy that monitors the project's ability to be sustainable in the social context.

5.3.2.4 Future Considerations for the Operations and Maintenance Phase

While reporting and monitoring of mini-grids is essential for ensuring compliance with technical performance it is also critical for providing transparency for the social impact the mini-grid has on the community it serves (Annecke, 2008). It is equally important for this reporting and monitoring process to accurately and truthfully represent the social impact the mini-grid has on the host community. This verification process can manifest in several forms from civil society endorsements to community-based reporting that is submitted jointly with that of the developer for comparison. This community-based verification process promotes the necessary community empowerment and inclusion in the overseeing of the project's operation phase in aspects that are directly related to the community. This therefore strengthens the energy democracy agenda by actively engaging the community in the information production that is essential for project evaluation and decision-making.

5.4 Conclusion remark: Energy citizenship status under the energy democracy agenda in decentralized mini-grid Project development

In closing, the paper recaps the findings of the final section of the results and discussion section with a note on the observed limitations of the study. The paper's findings on the state of energy citizenship under the energy democracy agenda in the existing decentralized mini-grids observed a pertinent imbalance in energy understanding from the host communities which by default implies an imbalance in citizen participation warranted by diverse views that exist as such. This state speaks on potential compromise in the decision-making process which implores the need for development strategies to prioritize energy education initiatives to fully achieve

sustainable development in decentralized mini-grid projects. The results in this section further noted a prevalent collective interest of the host communities in actively partaking in and entering into the institutional practices necessary for the development of the decentralized mini-grids. This positively speaks to the willingness of the beneficiaries to assume their energy citizenship role under the energy democracy agenda to exercise activism and sovereignty and represent a social authority that holds other stakeholders accountable in the development of decentralized mini-grids in Lesotho. Lastly, in this section, the study discovered that there is a consensus about community-oriented governance and management for sustainable development of decentralized mini-grids being ideal in empowering host beneficiaries and affording them the sovereignty to influence the deployment and the decision-making processes that advocate for the energy democracy agenda.

6. Limitations:

The study acknowledges the limitation that exists with the form of data collection utilized in the section of the study that focuses on evaluating the basic energy citizen status of the host communities and their potentiality in exercising their activism and sovereignty in enabling the energy democracy agenda in the sustainable development of decentralized mini-grids. The study recognizes that the results provide a general state of the community's interaction with the project along with its potential implication on the institution optimization project development and fails to explain and deduce the possible motivation and justification for this state. The study therefore warrants future research to address the gap underscored in this paper.

The difficulty of reaching the Motete village in person due to financial constraints and its inaccessibility, the process of data collection for this village was done through direct voice calls. The researcher is aware of the nature of this data collection process to affect the quality and reliability of the data collected where this restricts the magnitude of the data collection and the ability to employ a variation of research methodologies. Moreover, the questionnaires were translated from English to Sesotho, this the researcher also acknowledges its potential to affect the quality and reliability of the data in case the question's objectives may have been lost in translation. The researcher is also aware that the sample size of the host beneficiaries could have been improved by engaging with a larger number of households but in addressing this shortcoming the committee representation was prioritized in the sample population for the questionnaires. The research is also aware that for this particular study, the contextual nature of the projects may be interpreted as a limitation in the case where such findings apply to the rural and decentralized settings only.

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8. Appendix Section

Appendix 1: Data Analysis Code Book sources from Nvivo software

Name	Description
Overall Coding - Energy Democracy principles	
Community Active engagement and Adoption	This principle of energy democracy speaks on the communication of the expert stakeholders with the community to sensitize and allow the community to express whether or not they want to be part of the proposed project.
Beneficiaries Empowerment	This energy democracy principle speaks on the creation of responsibilities, activities, and an environment that promotes skill and personal development of the community and in return makes confident, independent, motivated, and active citizens.
Broadened Forms of Community Participation	This energy democracy principle speaks on active participation and ways to broaden such participation through on-the-ground active work and contribution to the project deliberations.
Community inclusivity of deployment and decision-making	This energy democracy principle speaks on the intentional involvement of all community members from different backgrounds to influence the initiation of the project as well as to be actively involved in the direction of the project.
Local Ownership	This energy principle speaks on the governance of the project resources and infrastructure to be either majority power being the communities or wholely owned or directed by them.
Development Expert Interview Coding - Practices and Institutional Processes in Life Cycle Phases for Decentralized Mini-grids	

Buil & Commission – System Evaluation and Approval	This practice and process involves quality control and assurance of project services in decentralized mini-grids in Lesotho.
Build & Commission - Recruitment	This practice and process involves the co-opt of the community in skilled, semiskilled, and Management roles assumed by the host community in decentralized mini-grid projects in Lesotho.
Design & Development - License Application	This practice and process talk about all the requirements, rules, and guidelines considered for the project to qualify for an operation license in decentralized minigrids in Lesotho.

Name	Description
Design & Development - Village Representative Selection	This practice and procedure identifies the approach used to select the village representative in the project development of decentralized mini-grid projects in Lesotho.
Inception & Planning - Village Survey and Selection	This practice and process focus on the approach in which the host village is selected and what the selection strategy prioritizes in the formulation of this survey in decentralized mini-grid projects in Lesotho.
Inception & Planning - Education	This practice and process speak on the efficiency and effectiveness of all attempts to educate the host communities on approaches and the strategies used in decentralized mini-grid projects in Lesotho.
Operation & Maintenance - Reporting and Monitoring	The practice and process speak on the integrity, fairness, and ethicality of the reporting and monitoring mechanisms used in decentralized mini-grid projects in Lesotho.